AMA Analytical Services, Inc.
Focused On Results.

NVLAP TESTING
NVLAP Lab Code 101143-0
NY ELAP
Lab ID 10920

Analytical Report for:

Testing of Official Samples of Talc Containing Cosmetics for Asbestiform Fibers

Contract Number: 75F40122P00335

Assignment DFPG# 23-19, Batch No. 05162023 (Batch #3)
AMA COC No. 647186

US FDA
Office of Cosmetics & Colors
4300 River Road
College Park, MD 20740

AMA Analytical Services, Inc.

Focused On Results. **CERTIFICATE OF ANALYSIS**

Chain of Custody: 647186
Client: US Food & Drug Administration
Address: Office of Cosmetics & Colors
4300 River Road
College Park, MD 20740
Attention: John Gasper

Job Name: Assignment DFPG #23-19
Job Location: Batch 3 (No. 05162023)
Job Number: CLIN 0001
PO Number: 75F40122P00335

Date Submitted: 5/26/2023
Date Analyzed: 8/15/2023-8/31/2023
Report Date: 9/29/2023
Date Sampled: Not Provided
Person Submitting: Sabrina McKiney
Revised: 10/13/2023 (Revision #1)

SUMMARY OF ANALYSIS

AMA Sample ID	Client Sample ID	TEM LOD Using ASTM D5756 Mass Calculation	TEM LOQ Using ASTM D5756 Mass Calculation	% Chrysotile by TEM Using ASTM D5756 Mass Calculation	% Amphibole by TEM Using ASTM D5756 Mass Calculation	% Total Chrysotile & Amphibole by TEM Using ASTM D5756 Mass Calculation	% Asbestos by PLM	% Organics	% Acid Soluable	% Other	Comments
647186-1	05162023-1	0.00000246%	0.00000983%	ND	ND	< 0.00001%	ND	11.98%	4.81%	83.21%	
647186-1A	05162023-1	0.00000221%	0.00000883%	ND	ND	< 0.00001%	ND	11.87%	4.92%	83.20%	
647186-1B	05162023-1	0.00000192%	0.00000767%	ND	ND	< 0.00001%	ND	12.03%	4.60%	83.37%	
647186-2	05162023-2	0.00000212%	0.00000847%	ND	ND	< 0.00001%	ND	4.32%	4.57%	91.12%	
647186-2A	05162023-2	0.00000179%	0.00000715%	ND	ND	< 0.00001%	ND	4.40%	4.27%	91.33%	
647186-2B	05162023-2	0.00000179%	0.00000717%	ND	ND	< 0.00001%	ND	4.30%	4.07%	91.63%	
647186-3	05162023-3	0.00000293%	0.00001173%	ND	ND	< 0.00001%	ND	29.11%	5.87%	65.02%	
647186-3A	05162023-3	0.00000266%	0.00001066%	ND	ND	< 0.00001%	ND	29.29%	9.11%	61.61%	
647186-3B	05162023-3	0.00000204%	0.00000817%	ND	ND	< 0.00001%	ND	29.17%	13.22%	57.61%	
647186-4	05162023-4	0.00000170%	0.00000679%	ND	ND	< 0.00001%	ND	11.41%	6.38%	82.22%	
647186-4A	05162023-4	0.00000176%	0.00000703%	ND	ND	< 0.00001%	ND	11.29%	4.66%	84.05%	
647186-4B	05162023-4	0.00000156%	0.00000624%	ND	ND	< 0.00001%	ND	11.36%	5.10%	83.54%	
647186-5	05162023-5	0.00000222%	0.00000887%	ND	ND	< 0.00001%	ND	14.11%	10.36%	75.53%	
647186-5A	05162023-5	0.00000194%	0.00000778%	ND	ND	< 0.00001%	ND	14.16%	10.69%	75.15%	
647186-5B	05162023-5	0.00000229%	0.00000229%	ND	ND	< 0.00001%	ND	14.19%	9.88%	75.93%	
647186-6	05162023-6	0.00000283%	0.00001133%	ND	ND	< 0.00001%	ND	18.73%	15.95%	65.32%	
647186-6A	05162023-6	0.00000300%	0.00000300%	ND	ND	< 0.00001%	ND	18.72%	16.02%	65.27%	
647186-6B	05162023-6	0.00000274%	0.00001096%	ND	ND	< 0.00001%	ND	18.81%	14.15%	67.04%	
647186-7	05162023-7	0.00000203%	0.00000813%	ND	ND	< 0.00001%	ND	13.61%	8.77%	77.62%	
647186-7A	05162023-7	0.00000235%	0.00000939%	ND	ND	< 0.00001%	ND	13.59%	7.96%	78.45%	
647186-7B	05162023-7	0.00000243%	0.00000973%	ND	ND	< 0.00001%	ND	13.53%	10.37%	76.10%	
647186-8	05162023-8	0.00000257%	0.00433689%	ND	< 0.00434%	< 0.00434%	ND	9.55%	16.90%	73.55%	Amphibole type is Tremolite
647186-8A	05162023-8	0.00000255%	0.00001020%	ND	ND	< 0.00001%	ND	10.75%	14.81%	74.44%	
647186-8B	05162023-8	0.00000232%	0.00000929%	ND	ND	< 0.00001%	ND	9.65%	16.00%	74.35%	
647186-9	05162023-9	0.00000293%	0.00001171%	ND	ND	< 0.00001%	ND	10.43%	17.30%	72.27%	
647186-9A	05162023-9	0.00000553%	0.00002212%	ND	ND	< 0.00002%	ND	10.50%	19.80%	69.70%	
647186-9B	05162023-9	0.00000302%	0.00001207%	ND	ND	< 0.00001%	ND	10.48%	18.12%	71.40%	
647186-10	05162023-10	0.00000209%	0.00000836%	ND	ND	< 0.00001%	ND	11.92%	10.64%	77.44%	
647186-10A	05162023-10	0.00000197%	0.00000788%	ND	ND	< 0.00001%	ND	11.93%	10.41%	77.66%	
647186-10B	05162023-10	0.00000136%	0.00000543%	ND	ND	< 0.00001%	ND	11.96%	12.47%	75.58%	
647186-11	05162023-11	0.00000320%	0.00001281%	ND	ND	< 0.00001%	ND	7.94%	13.84%	78.22%	
647186-11A	05162023-11	0.00000202%	0.00000807%	ND	ND	< 0.00001%	ND	7.90%	13.95%	78.15%	
647186-11B	05162023-11	0.00000246%	0.00000985%	ND	ND	< 0.00001%	ND	7.92%	17.81%	74.26%	
647186-12	05162023-12	0.00000140%	0.01209706%	ND	< 0.01210%	< 0.01210%	ND	9.65%	11.57%	78.77%	Amphibole type is Actinolite
647186-12A	05162023-12	0.00000143%	0.00000572%	ND	ND	< 0.00001%	ND	9.64%	9.12%	81.24%	
647186-12B	05162023-12	0.00000152%	0.00000608%	ND	ND	< 0.00001%	ND	9.62%	9.22%	81.15%	
647186-13	05162023-13	0.00000197%	0.00000788%	ND	ND	< 0.00001%	ND	23.31%	10.82%	65.88%	
647186-13A	05162023-13	0.00000219%	0.00000877%	ND	ND	< 0.00001%	ND	23.33%	10.21%	66.46%	
647186-13B	05162023-13	0.00000184%	0.00000734%	ND	ND	< 0.00001%	ND	23.38%	9.75%	66.87%	
647186-14	05162023-14	0.00000190%	0.00000758%	ND	ND	< 0.00001%	ND	34.22%	10.07%	55.71%	
647186-14A	05162023-14	0.00000160%	0.00000641%	ND	ND	< 0.00001%	ND	34.11%	7.61%	58.28%	

AMA Analytical Services, Inc.

Focused On Results. **CERTIFICATE OF ANALYSIS**

Chain of Custody: 647186
Client: US Food & Drug Administration
Address: Office of Cosmetics & Colors
4300 River Road
College Park, MD 20740
Attention: John Gasper

Job Name: Assignment DFPG #23-19
Job Location: Batch 3 (No. 05162023)
Job Number: CLIN 0001
PO Number: 75F40122P00335

Date Submitted: 5/26/2023
Date Analyzed: 8/15/2023-8/31/2023
Report Date: 9/29/2023
Date Sampled: Not Provided
Person Submitting: Sabrina McKiney
Revised: 10/13/2023 (Revision #1)

SUMMARY OF ANALYSIS

AMA Sample ID	Client Sample ID	TEM LOD Using ASTM D5756 Mass Calculation	TEM LOQ Using ASTM D5756 Mass Calculation	% Chrysotile by TEM Using ASTM D5756 Mass Calculation	% Amphibole by TEM Using ASTM D5756 Mass Calculation	% Total Chrysotile & Amphibole by TEM Using ASTM D5756 Mass Calculation	% Asbestos by PLM	% Organics	% Acid Soluable	% Other	Comments
647186-14B	05162023-14	0.00000192%	0.00000768%	ND	ND	< 0.00001%	ND	34.10%	9.44%	56.46%	
647186-15	05162023-15	0.00000213%	0.00000853%	ND	ND	< 0.00001%	ND	44.55%	15.27%	40.18%	
647186-15A	05162023-15	0.00000252%	0.00001008%	ND	ND	< 0.00001%	ND	44.99%	13.84%	41.17%	
647186-15B	05162023-15	0.00000179%	0.00000715%	ND	ND	< 0.00001%	ND	45.23%	10.62%	44.16%	
647186-16	05162023-16	0.00000410%	0.00001640%	ND	ND	< 0.00002%	ND	5.90%	21.69%	72.41%	
647186-16A	05162023-16	0.00000308%	0.00001234%	ND	ND	< 0.00001%	ND	5.78%	19.05%	75.17%	
647186-16B	05162023-16	0.00000304%	0.00001215%	ND	ND	< 0.00001%	ND	5.84%	17.28%	76.88%	
647186-17	05162023-17	0.00000207%	0.00000829%	ND	ND	< 0.00001%	ND	19.55%	8.77%	71.68%	
647186-17A	05162023-17	0.00000213%	0.00000851%	ND	ND	< 0.00001%	ND	19.85%	7.85%	72.30%	
647186-17B	05162023-17	0.00000184%	0.00000736%	ND	ND	< 0.00001%	ND	19.54%	8.68%	71.78%	
647186-18	05162023-18	0.00000223%	0.00000890%	ND	ND	< 0.00001%	ND	31.79%	10.16%	58.04%	
647186-18A	05162023-18	0.00000297%	0.00001186%	ND	ND	< 0.00001%	ND	31.75%	11.30%	56.95%	
647186-18B	05162023-18	0.00000260%	0.00001042%	ND	ND	< 0.00001%	ND	31.84%	12.14%	56.03%	
647186-19	05162023-19	0.00000254%	0.00001017%	ND	ND	< 0.00001%	ND	49.78%	9.90%	40.32%	
647186-19A	05162023-19	0.00000261%	0.00001046%	ND	ND	< 0.00001%	ND	49.80%	12.64%	37.56%	
647186-19B	05162023-19	0.00000249%	0.00000998%	ND	ND	< 0.00001%	ND	49.72%	10.53%	39.75%	

LOD = Limit of Detection **LOQ** = Limit of Quantification **ND** = Not Detected **PLM** = Polarized Light Microscopy **TEM** = Transmission Electron Microscopy

Analytical Method(s): PLM by Modified NY ELAP 198.6
TEM by Modified NY ELAP 198.4/ASTM D5756

Analyst(s): **PLM** (b) (6)
TEM Andreas Saldivar

Technical Director: Andreas Saldivar

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy

FDA Office of Cosmetics & Colors

Table of Contents

COC 647186

Record Changes Report

Date	Description
10/13/2023	p. 1 of Certificate of Analysis: Corrected rounding error in percent amphibole and percent total chrysotile and amphibole value for sample 647186-12 to < 0.01210%.
10/13/2023	p. 23: Corrected typo in Contract/PO Number to correctly read "75F40122P00335." Also corrected a grammatical error in the Sample Receipt Description paragraph.
10/13/2023	p. 212: Corrected a grammatical error in the fifth paragraph discussing TEM Grid Preparation Blank Samples.
10/13/2023	p. 281: Corrected minor typo in the analytical bench sheet heading for 647186-6, 6A, 6B/05162023-6.

Chain of Custody

AMA Analytical Services, Inc.
Focused On Results.
AIHA-LAP (#100470) NVLAP (#101143-0) NY ELAP (#10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643
www.amalab.com

(COC # Assigned upon arrival at lab.) **647186**

CHAIN OF CUSTODY
Asbestos in Talc/Cosmetics

Mailing/Billing Information:
Client Name: US Food & Drug Administration
Address: Office of Cosmetics and Colors
Address: 4300 River Road
Address: College Park, MD 20740
Phone #: Fax #:

Submittal Information:
Job Name: Assignment DFPG #23-19
Job Location: Batch 3 (05162023)
Job #: CLIN 0001 P.O. #: 75F40122P000335
Point of Contact: John Gasper Cell #: 240-402-1133
Collected by: Cell #:

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 6-Weeks & email/fax to contacts of file.

TURN AROUND TIME (TAT):		REPORT TO:
After Hours (must be pre-scheduled)	Normal Business Hours	✓ Email: john.gasper@fda.hhs.gov
After Hours Service is not provided for Asbestos in Talc/Cosmetics Analysis	☐ 10-Day (2-Weeks) ☐ 3-4 Weeks ☐ 6– Weeks Due Date: 8/31/2023 ✓ 4-6 Weeks	✓ Email CC 1: steven.wolfgang.fda.hhs.gov ☐ Email CC 2: ☐ Verbals

Sample Type
✓ FDA Modified Procedures for PLM-ELAP 198.6 & TEM ELAP 198.4 19 (QTY)
Data Package Level [Select One]: ____Standard (Certificate of Analysis & Signed COC) ____Level I (Standard + QA/QC Summary) ____Level II (I + Bench Sheets) ✓ Level III (II + Case Narrative)

*If field data sheets are submitted, there is no need to complete bottom section ✓ All samples received in good condition unless otherwise noted.

Sample Information

Sample Number	No. of Aliquots to Prepare & Analyze	Sample Description (ie, color, container size, etc.) [samples must must be submitted blind such that AMA cannot determine the source of the material being submitted for analysis]	Comments/Instructions
Item #s 1-18	3	18 '1-oz glass jars submitted in vacuum sealed plastic bags with	
		the custody seals intact (sealed by Sabrina McKinney & Andrea	
		Heise 5/16/2023 - 5/24/2023)	
Item # 19	3	1 '1-oz glass jars submitted in a vacuum sealed plastic bag with	#19 received via UPS tracking no.
		the custody seal intact (sealed by Sabrina McKinney 6/2/2023)	1ZA4995A0192914004 on 6/7/2023 at 09:26
		See attached FDA COCs for additional details.	

	Print Name	Sign Name	Date	Time	Shipping Information
Relinquished by:					✓ UPS ☐ FedEx ☐ USPS ☐ In-Person ☐ Drop Box ☐ Courier ☐ Other
Received by:	(b) (6)		5/26/2023	09:45	(b) (6)

Asbestos · Lead · Mold · Nano

FDA U.S. FOOD & DRUG ADMINISTRATION
OFFICE OF REGULATORY AFFAIRS

1DFC 6th Ave & Kipling St
Bldg 20, Door W-10
P.O. Box 25087
Denver, CO 80225-0087

May 25, 2023

AMA Analytical Services, Inc.
Attn (b) (6)
4475 Forbes Blvd.
Lanham, MD 20706
Phone: 301-459-2640

Re: Samples for Asbestos Analysis, Batch #05162023

Dear (b) (6)

Enclosed in the box are eighteen vials of approx. 5-g solid sample of commercial talc-containing cosmetic products being submitted for analysis for asbestiform fibers by transmission electron microscope (TEM) per FDA Assignment DFPG #23-19, Contract No. #75F40122P00335. Also included in box is one chain of custody form to be completed by recipient for tracking of sample batch at AMA. Please analyze samples as agreed.

The eighteen samples in this shipment constitute Batch 3 (No. 05162023) of the 50 samples that will be submitted to AMA for analysis in 2023.

If there are any questions, please contact: John Gasper: 240-402-1133 john.gasper@fda.hhs.gov

Best regards,

Sabrina M. McKinney
Chemist

Chemistry Branch
Denver Laboratory
Office of Regulatory Affairs
U.S. Food and Drug Administration
T: 303-236-9665
sabrina.mckinney@fda.hhs.gov

Enclosure: Chain of custody

FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 1 of 3

Batch No: 05162023

Submitter: Sabrina M. McKinney

Assignment No./ Contract No.: DFPG# 23-19 / #75F40122P00335

AMA COC No.:

Date Sealed: 5/25/23 Sample Type: Official Samples

Description of Evidence		
Item #	**Quantity**	**Description of Item** (Lab#, Lot #, Condition)
05162023-1	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-2	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-3	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-4	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-5	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-6	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-7	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-8	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-9	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-10	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-11	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-12	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-13	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-14	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-15	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-16	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

For the most current and official copy, check QMiS

FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 2 of 3

05162023-17	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
05162023-18	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample

Chain of Custody				
Item #	**Date**	**Released by** (Print Name)	**Released by** (Signature)	**Comments/Location**
1-18	5/25/23	Sabrina McKinney		ORA/DENL

Chain of Custody				
Item #	**Date/Time**	**Received by** (Print Name)	**Received by** (Signature)	**Comments/Location**
1-18	5/26/23			AMA

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

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FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 3 of 3

Final Disposal Authority

Authorization for Disposal

Item(s) #: _____ on this document is/are no longer needed as evidence and is/are authorized for disposal by (check appropriate disposal method)

☐ Return to Submitter ☐ Destruction

Name of Authorizing Official: _____ Date: _____

Signature: _____

Witness to Destruction of Evidence

Item(s) #: _____ on this document were destroyed by (Name) _____
in my presence on (date) _____.
Name of Witness to destruction: _____ Signature: _____Date:
_____

Release to Lawful Owner

Item(s) #: _____ on this document was/were released by Evidence Custodian
_____ID#:_____ to
Name _____
Address: _____ City: _____State: _____
Zip Code: _____
Telephone Number: (_____) _____
Under penalty of law, I certify that I am the lawful owner of the above item(s).

Signature: _____ Date: _____

Copy of Government-issued photo identification is attached. ☐ Yes ☐ No

This form is to be retained as a permanent record by the Center for Food Safety and Applied Nutrition, Office of Cosmetics and Colors.

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

For the most current and official copy, check QMiS

FDA U.S. FOOD & DRUG ADMINISTRATION
OFFICE OF REGULATORY AFFAIRS

1DFC 6th Ave & Kipling St
Bldg 20, Door W-10
P.O. Box 25087
Denver, CO 80225-0087

June 6, 2023

AMA Analytical Services, Inc.
Attn: (b) (6)
4475 Forbes Blvd.
Lanham, MD 20706
Phone: 301-459-2640

Re: Samples for Asbestos Analysis, Batch #05162023, additional sample

Dear (b) (6):

Enclosed in the box is one vial of approx. 5-g solid sample of commercial talc-containing cosmetic products being submitted for analysis for asbestiform fibers by transmission electron microscope (TEM) per FDA Assignment DFPG #23-19, Contract No. #75F40122P00335. Also included in box is one chain of custody form to be completed by recipient for tracking of sample batch at AMA. Please analyze samples as agreed.

The one sample in this shipment is part of Batch 3 (No. 05162023) of the 50 samples that will be submitted to AMA for analysis in 2023.

If there are any questions, please contact: John Gasper: 240-402-1133 john.gasper@fda.hhs.gov

Best regards,

Sabrina M. McKinney
Chemist

Chemistry Branch
Denver Laboratory
Office of Regulatory Affairs
U.S. Food and Drug Administration
T: 303-236-9665
sabrina.mckinney@fda.hhs.gov

Enclosure: Chain of custody

FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 1 of 3

Batch No: 05162023

Submitter: Sabrina M. McKinney

Assignment No./ Contract No.: DFPG# 23-19 / #75F40122P00335

AMA COC No.:

Date Sealed: 6/16/23 Sample Type: Official Samples

Description of Evidence		
Item #	**Quantity**	**Description of Item** (Lab#, Lot #, Condition)
05162023-19	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

For the most current and official copy, check QMiS

FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 2 of 3

Chain of Custody				
Item #	**Date**	**Released by** (Print Name)	**Released by** (Signature)	**Comments/Location**
19	6/6/23	Sabrina McKinney	Sabrina McKinney	ORA/DENL

Chain of Custody				
Item #	**Date/Time**	**Received by** (Print Name)	**Received by** (Signature)	**Comments/Location**
19	6/7/23			AMA

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

For the most current and official copy, check QMiS

FOOD AND DRUG ADMINISTRATION OFFICE OF REGULATORY AFFAIRS *Office of Regulatory Science*	Document Number: FORM-000796	Revision #: 00 Revised: 02/21/2020
Title: **Cosmetic Talc Sample Chain-of-Custody Form**		Page 3 of 3

Final Disposal Authority

Authorization for Disposal

Item(s) #: _____ on this document is/are no longer needed as evidence and is/are authorized for disposal by (check appropriate disposal method)

☐ Return to Submitter ☐ Destruction

Name of Authorizing Official: _____ Date: _____

Signature: _____

Witness to Destruction of Evidence

Item(s) #: _____ on this document were destroyed by (Name) _____
in my presence on (date) _____.

Name of Witness to destruction: _____ Signature: _____ Date: _____

Release to Lawful Owner

Item(s) #: _____ on this document was/were released by Evidence Custodian _____ ID#: _____ to

Name _____

Address: _____ City: _____ State: _____

Zip Code: _____

Telephone Number: (_____) _____

Under penalty of law, I certify that I am the lawful owner of the above item(s).

Signature: _____ Date: _____

Copy of Government-issued photo identification is attached. ☐ Yes ☐ No

This form is to be retained as a permanent record by the Center for Food Safety and Applied Nutrition, Office of Cosmetics and Colors.

Adapted from: Technical Working Group on Biological Evidence Preservation. *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*. U.S. Department of Commerce, National Institute of Standards and Technology. 2013.

UPS Delivery Confirmation

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
(b) (6)

Weight
2.00 LBS

Service
UPS Next Day Air®

Shipped / Billed On
05/25/2023

Delivered On
05/26/2023 9:45 A.M.

Delivered To
LANHAM, MD, US

Received By
(b) (6)

Left At
Mail Room

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 06/19/2023 12:34 P.M. EST

From: UPS
To: (b) (6)
Subject: UPS Status Notification, Tracking Number (b) (6)
Date: Monday, June 19, 2023 12:37:21 PM

Please see below for package information and current transit status.

Scheduled Delivery Date: Friday, 05/26/2023

UPS My Choice for home

Shipment Details

Tracking Detail

Your package is on time with a scheduled delivery date of 05/26/2023

Tracking Number:	(b) (6)
Status:	Delivered
Scheduled Delivery:	05/26/2023
Shipped To:	LANHAM, MD, US
UPS Service:	UPS Next Day Air®
Number of Packages:	1
Weight:	2.0 LBS

Package Progress

Location	Date	Local Time	Description
LANHAM, MD, US	05/26/2023	9:45 AM	DELIVERED
Landover, MD, United States	05/26/2023	9:29 AM	Out For Delivery Today
Landover, MD, United States	05/26/2023	7:23 AM	Processing at UPS Facility

Landover, MD, United States	05/26/2023	7:20 AM	Arrived at Facility
Linthicum, MD, United States	05/26/2023	6:34 AM	Departed from Facility
Linthicum, MD, United States	05/26/2023	5:46 AM	Arrived at Facility
Rockford, IL, United States	05/26/2023	2:58 AM	Departed from Facility
Rockford, IL, United States	05/26/2023	1:03 AM	Arrived at Facility
Commerce City, CO, United States	05/25/2023	9:54 PM	Departed from Facility
Commerce City, CO, United States	05/25/2023	7:20 PM	Arrived at Facility
Commerce City, CO, United States	05/25/2023	6:21 PM	Origin Scan
United States	05/25/2023	12:30 PM	Shipper created a label, UPS has not received the package yet.

Tracking results provided by UPS 06/19/2023 12:37 P.M. Eastern Time

NOTICE: UPS authorizes you to use UPS tracking systems solely to track shipments tendered by or for you to UPS for delivery and for no other purpose. Any other use of UPS tracking systems and information is strictly prohibited.

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Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
(b) (6)

Weight
1.00 LBS

Service
UPS Next Day Air®

Shipped / Billed On
06/06/2023

Delivered On
06/07/2023 9:26 A.M.

Delivered To
LANHAM, MD, US

Received By
(b) (6)

Left At
Office

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 06/19/2023 12:35 P.M. EST

From: UPS
To: (b) (6)
Subject: UPS Status Notification, Tracking Number (b) (6)
Date: Monday, June 19, 2023 12:36:55 PM

Please see below for package information and current transit status.

Scheduled Delivery Date: Wednesday, 06/07/2023

UPS My Choice for home

Shipment Details

Tracking Detail

Your package is on time with a scheduled delivery date of 06/07/2023

Tracking Number: (b) (6)

Status: Delivered

Scheduled Delivery: 06/07/2023

Shipped To: LANHAM, MD, US

UPS Service: UPS Next Day Air®

Number of Packages: 1

Weight: 1.0 LBS

Package Progress

Location	Date	Local Time	Description
LANHAM, MD, US	06/07/2023	9:26 AM	DELIVERED
Landover, MD, United States	06/07/2023	9:18 AM	Out For Delivery Today
Landover, MD, United States	06/07/2023	7:37 AM	Processing at UPS Facility

Landover, MD, United States	06/07/2023	7:15 AM	Arrived at Facility
Linthicum, MD, United States	06/07/2023	6:29 AM	Departed from Facility
Linthicum, MD, United States	06/07/2023	5:54 AM	Arrived at Facility
Rockford, IL, United States	06/07/2023	3:06 AM	Departed from Facility
Rockford, IL, United States	06/07/2023	12:40 AM	Arrived at Facility
Commerce City, CO, United States	06/06/2023	9:34 PM	Departed from Facility
Denver, CO, United States	06/06/2023	8:30 PM	Arrived at Facility
Commerce City, CO, United States	06/06/2023	7:55 PM	Origin Scan
Commerce City, CO, United States	06/06/2023	3:27 PM	Pickup Scan
United States	06/06/2023	11:34 AM	Shipper created a label, UPS has not received the package yet.

Tracking results provided by UPS 06/19/2023 12:36 P.M. Eastern Time

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Case Narrative

Client Name:	FDA Office of Cosmetics & Colors	**Contact:**	John Gasper
Contract Number:	75F40122P00335	**Phone:**	(240) 402-1133
Job Name/Location:	Assignment DFPG# 23-19 Batch No. 05162023 (Batch #3)	**Email:**	john.gasper@fda.hhs.gov
AMA COC Number:	647186	**Date Received:**	May 26, 2023 & June 7, 2023

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
647186-1	05162023-1	Cinnamon colored, slightly clumpy powder with a pearlescent appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-1A	05162023-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-1B	05162023-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-2	05162023-2	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-2A	05162023-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-2B	05162023-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-3	05162023-3	Rose colored, slightly clumpy powder with a pearlescent appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-3A	05162023-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-3B	05162023-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-4	05162023-4	Dark brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-4A	05162023-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-4B	05162023-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-5	05162023-5	Nude colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-5A	05162023-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-5B	05162023-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
647186-6	05162023-6	Beige colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-6A	05162023-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-6B	05162023-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-7	05162023-7	Salmon colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-7A	05162023-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-7B	05162023-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-8	05162023-8	Ivory colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-8A	05162023-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-8B	05162023-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-9	05162023-9	Tan colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-9A	05162023-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-9B	05162023-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-10	05162023-10	Beige colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-10A	05162023-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-10B	05162023-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-11	05162023-11	Cinnamon colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-11A	05162023-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-11B	05162023-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-12	05162023-12	Dark brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-12A	05162023-12		Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
647186-12B	05162023-12		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-13	05162023-13	Tan colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-13A	05162023-13		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-13B	05162023-13		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-14	05162023-14	Ivory colored (with yellow undertones), fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-14A	05162023-14		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-14B	05162023-14		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-15	05162023-15	Ivory colored (with pink undertones), fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-15A	05162023-15		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-15B	05162023-15		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-16	05162023-16	Very pale pink (almost white) colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-16A	05162023-16		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-16B	05162023-16		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-17	05162023-17	Beige colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-17A	05162023-17		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-17B	05162023-17		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-18	05162023-18	Light gray colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-18A	05162023-18		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-18B	05162023-18		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-19	05162023-19	Cream colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
647186-19A	05162023-19		Mod. PLM ELAP 198.6/TEM ELAP 198.4
647186-19B	05162023-19		Mod. PLM ELAP 198.6/TEM ELAP 198.4

Summary of Samples Received 1

Requested Analyses: PLM Analysis for asbestos fibers conducted by Modified NY ELAP Method 198.6 and TEM Analysis for asbestos fibers conducted by Modified NY ELAP Method 198.4

Sample Receipt Description

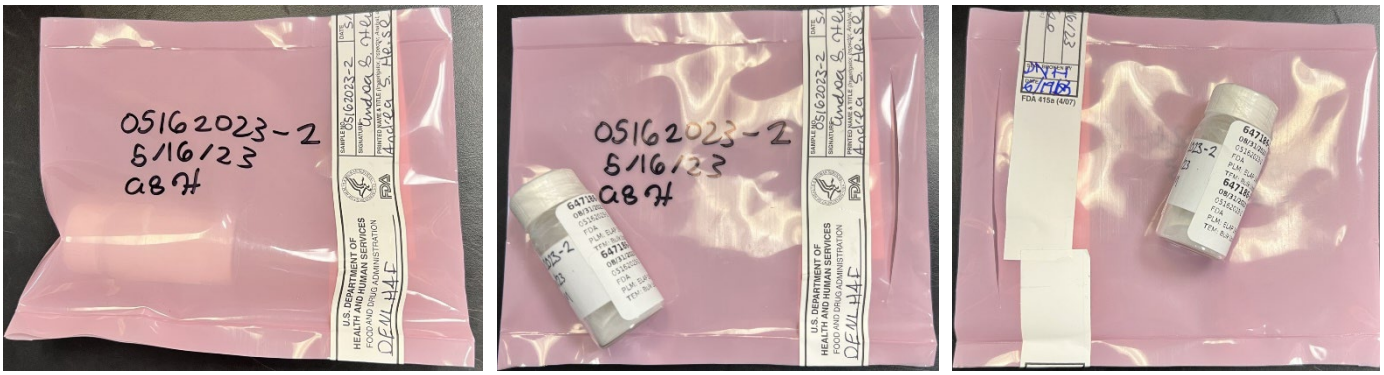
The samples were received at AMA Analytical Services, Inc. on May 26, 2023, at 09:45 via UPS Tracking No. (b) (6) by (b) (6), who assigned them to Chain of Custody (COC) No. 647186. This COC number served as the internal laboratory job number for tracking purposes. The set consisted of eighteen (18) powder samples submitted in ~1-oz glass jars; each jar of powder was sealed with parafilm and individually packaged in a pink vacuum and custody sealed plastic bag. An additional powder sample was received on June 7, 2023, at 09:26 via UPS Tracking No. (b) (6). This single sample, also submitted in a ~1-oz glass jar that was sealed with parafilm and packaged in a pink vacuum and custody sealed plastic bag, was added to COC 647186. Conditions were checked upon receipt and all sample containers and custody seals were intact. The samples were entered into the AMA laboratory database on June 19, 2023, at 12:51 by (b) (6). The samples were logged in for analysis in triplicate and each sample aliquot was assigned a unique laboratory identification number as shown in the table above. After sample login, the set was transferred to AMA's lockbox for storage; the samples were also stored in AMA's lockbox during the period between receipt and login.

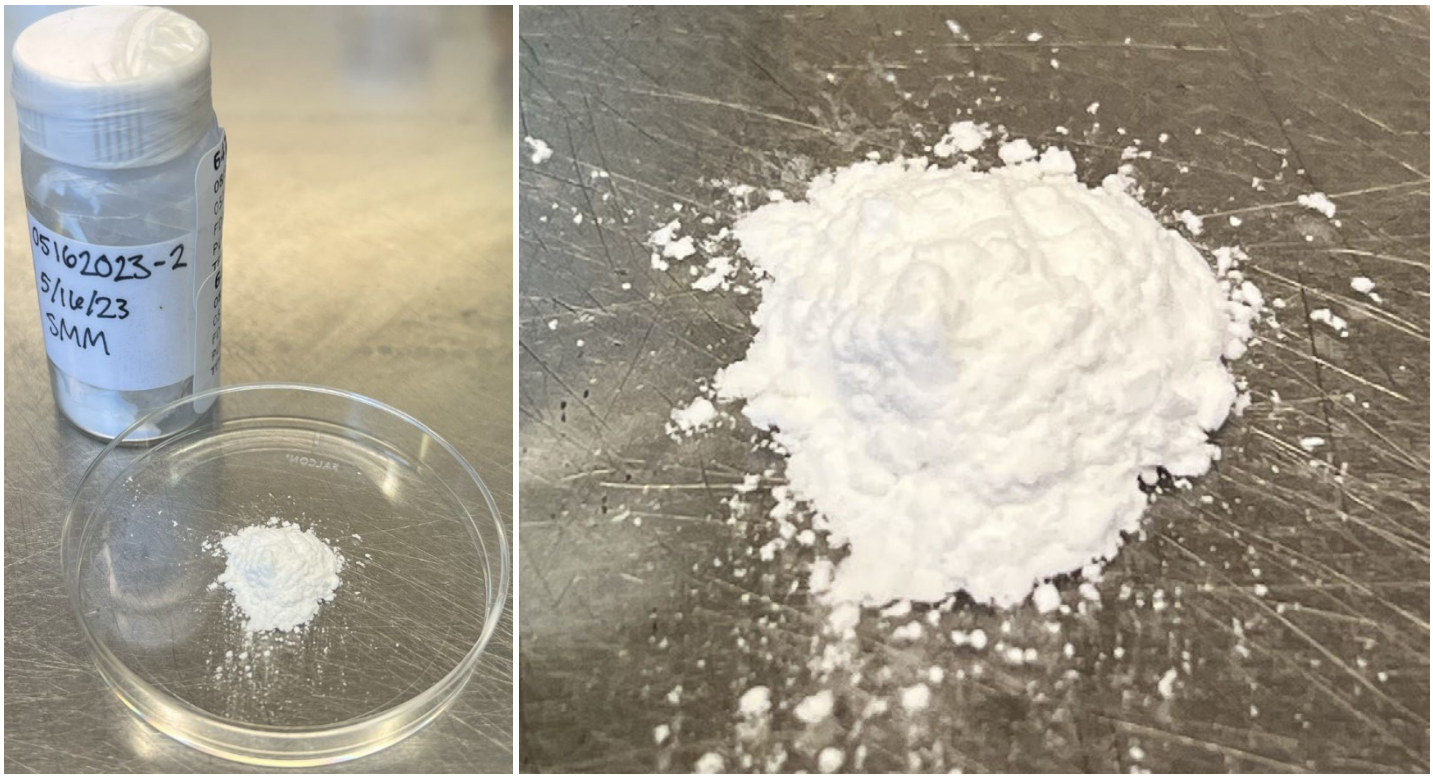
The following pictures document the condition of samples upon receipt at AMA:


05162023-1
5/16/23
05162023-4
5/17/23
SMM
05162023-8
5/9/23
SMM
05162023-12
5/22/23
05162023-16
5/24/23
SMM
05162023-2
5/16/23
05162023-5
5/17/23
05162023-9
5/19/23
SMM
05162023-13
5/23/23
05162023-17
5/24/23
05162023-3
5/17/23
05162023-6
5/17/23
05162023-10
5/22/23
05162023-14
5/23/23
05162023-7
5/19/23
SMM
05162023-11
5/22/23
05162023-15
5/23/23
05162023-18
5/24/23

647186-1, 1A, 1B/05162023-1

647186-2, 2A, 2B/05162023-2





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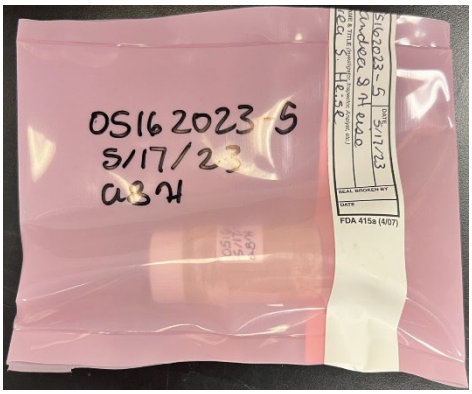
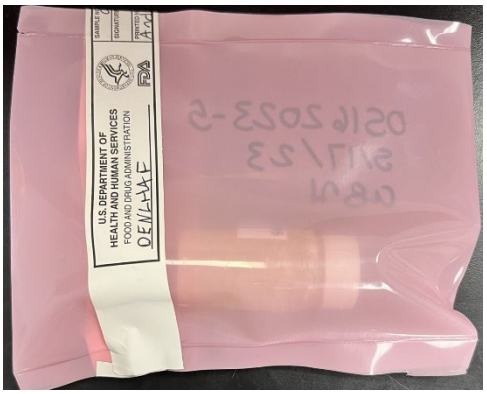
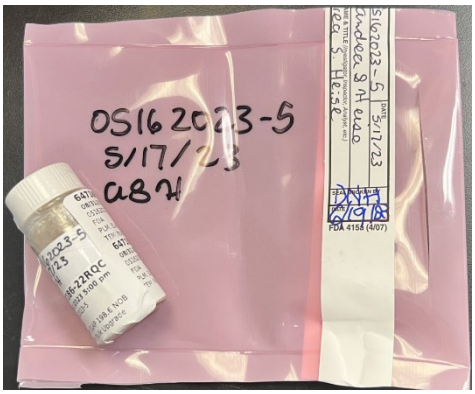
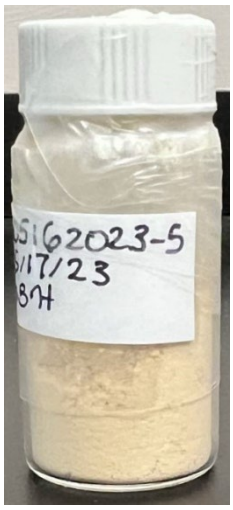
647186-4, 4A, 4B/02212023-4

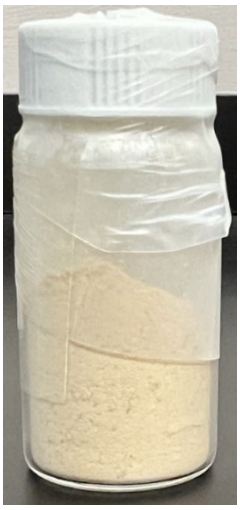
647186-5, 5A, 5B/05162023-5

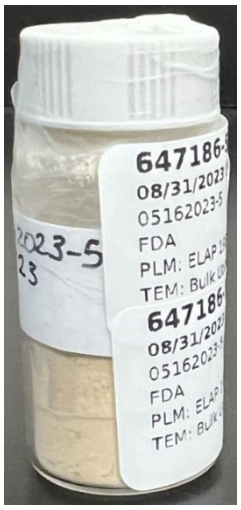


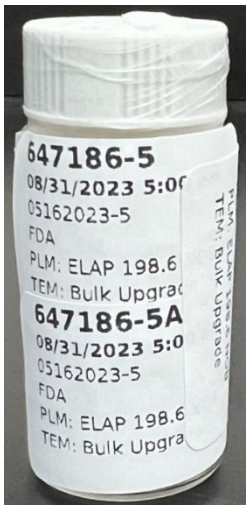


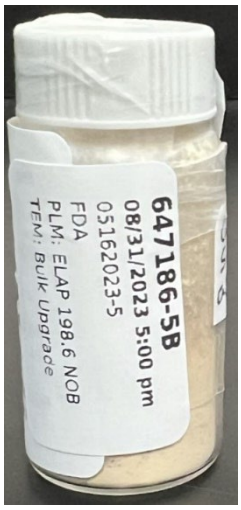


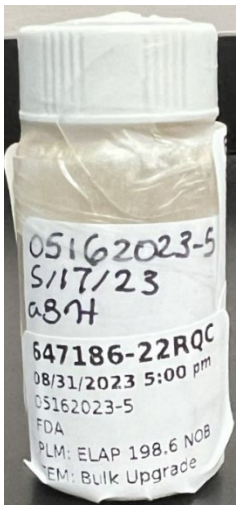


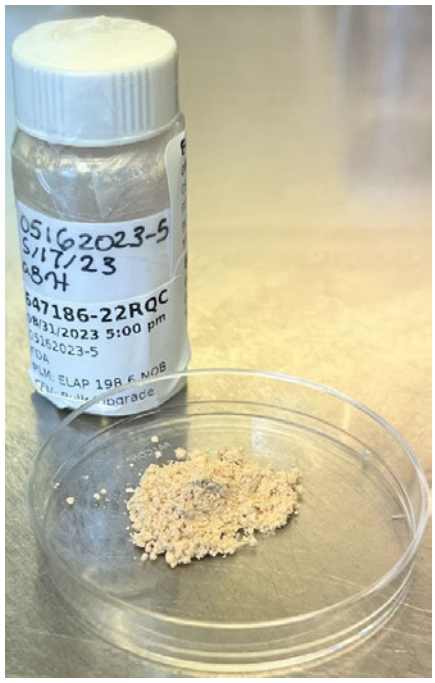


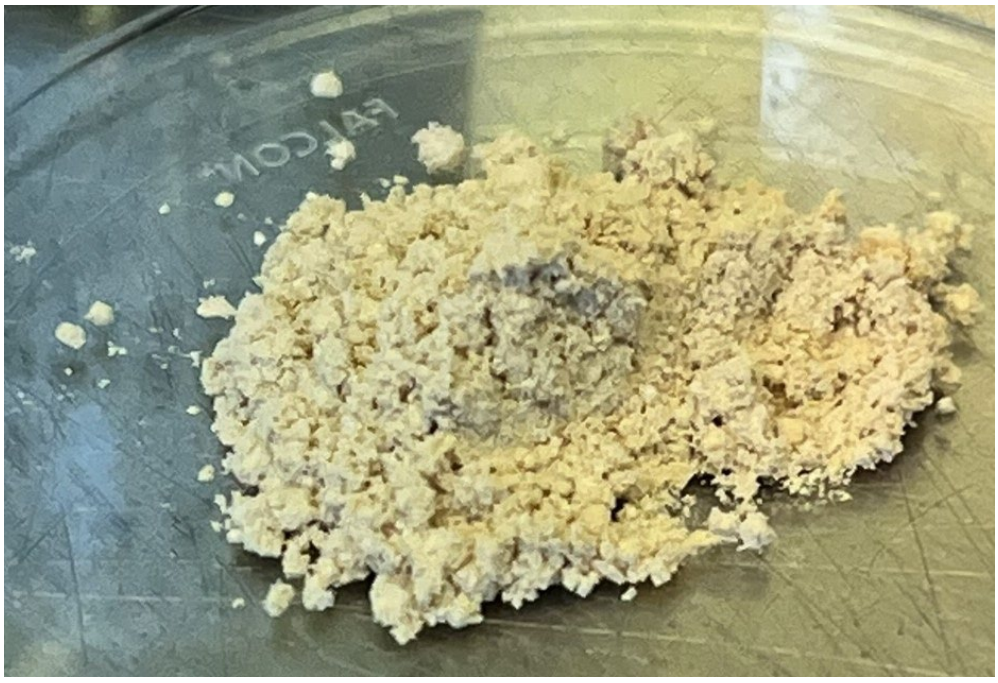




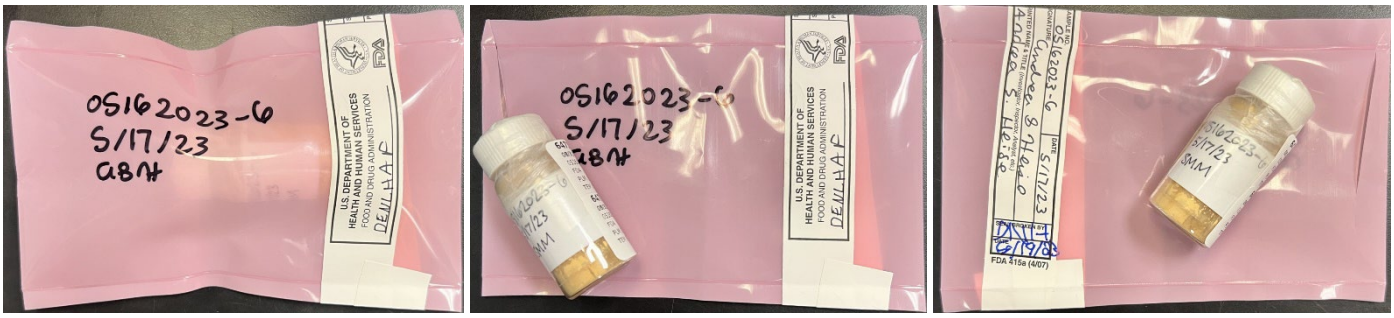


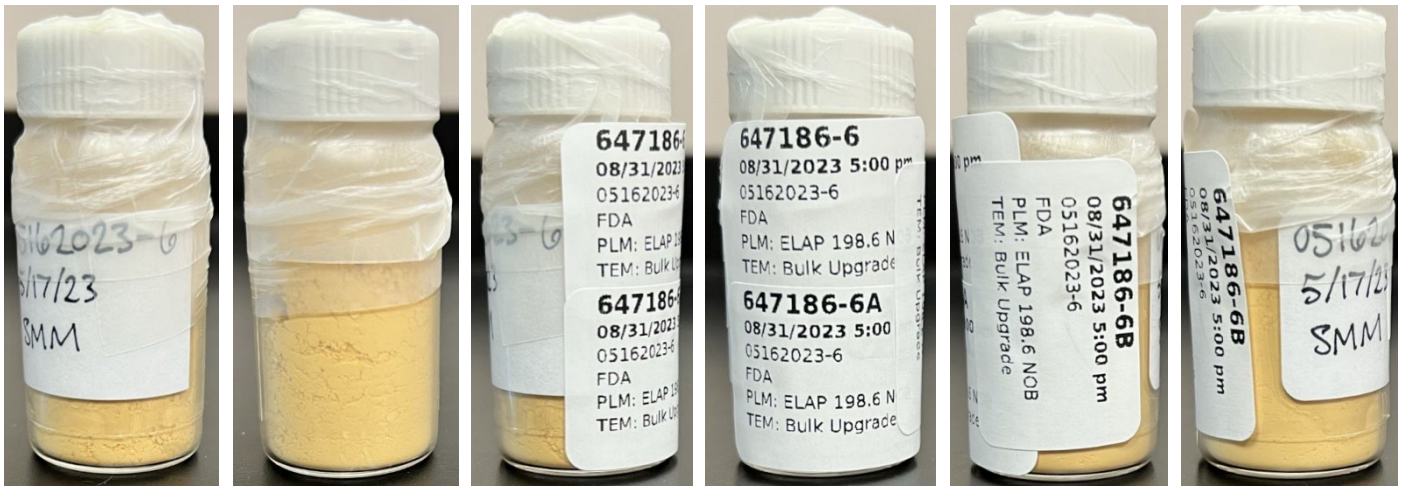


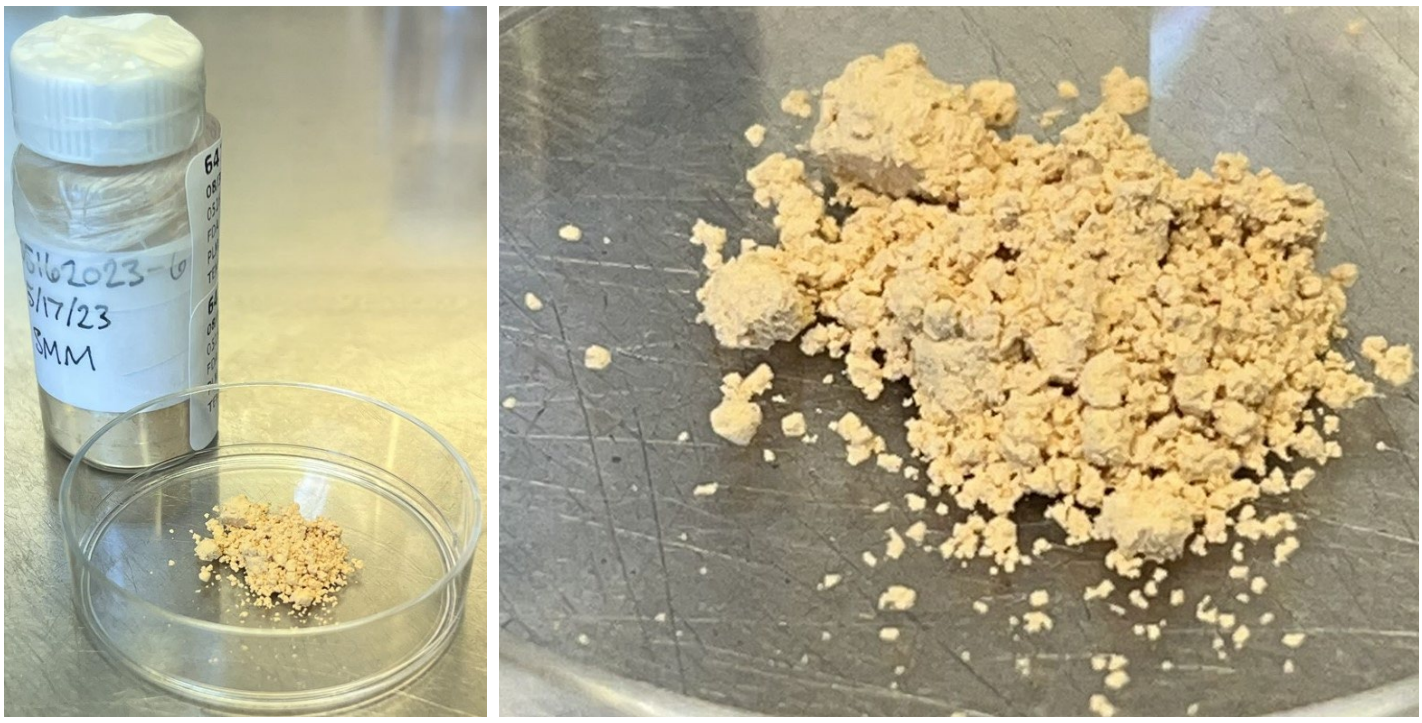




647186-6, 6A, 6B/05162023-6







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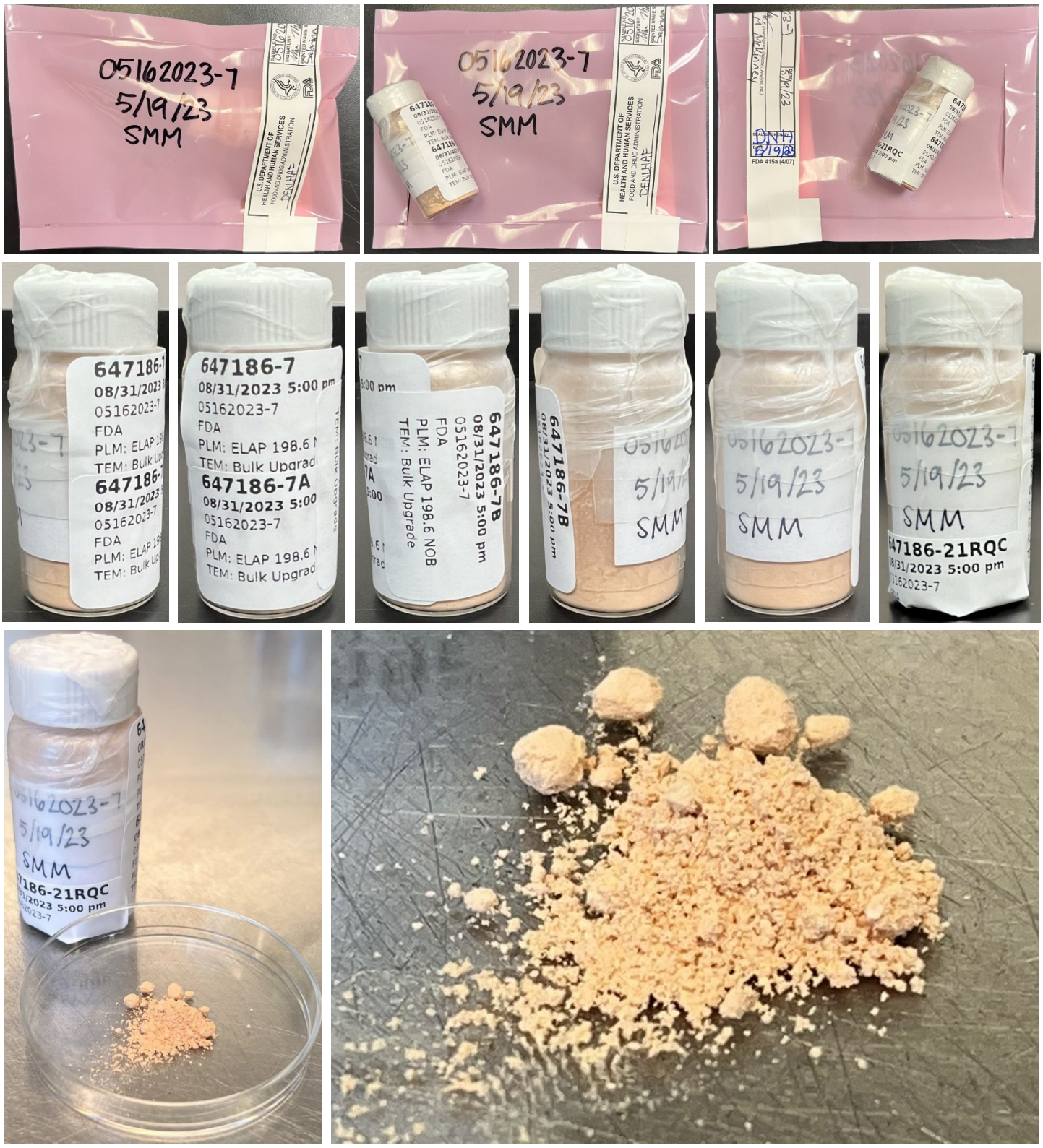

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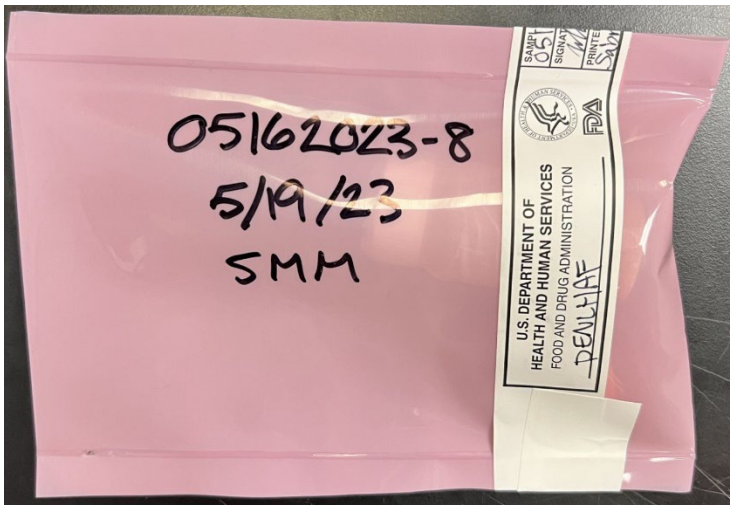

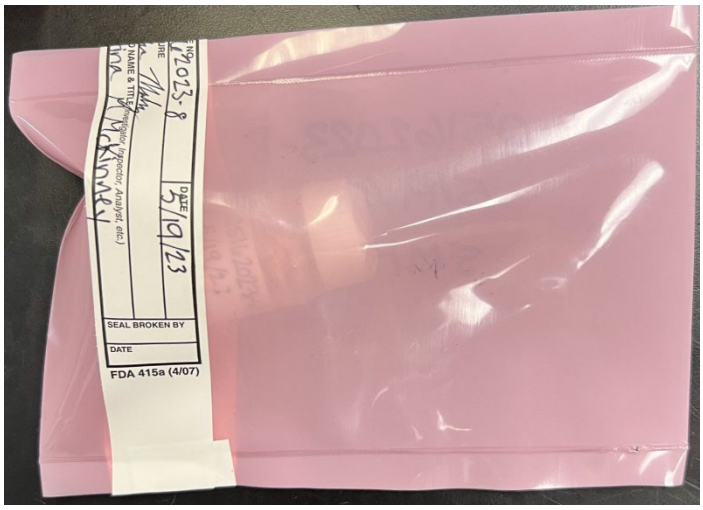

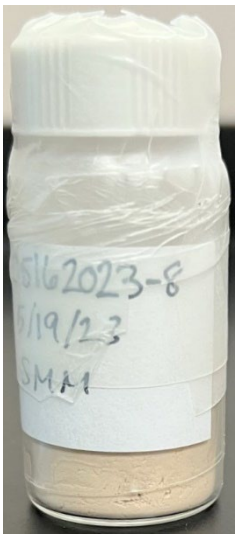

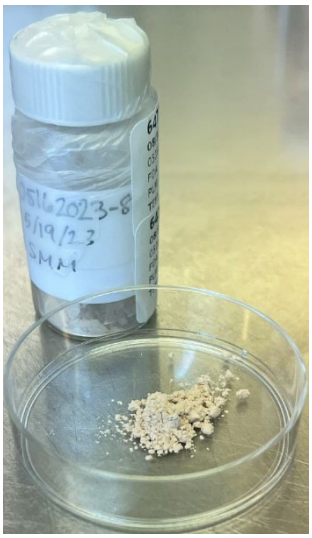

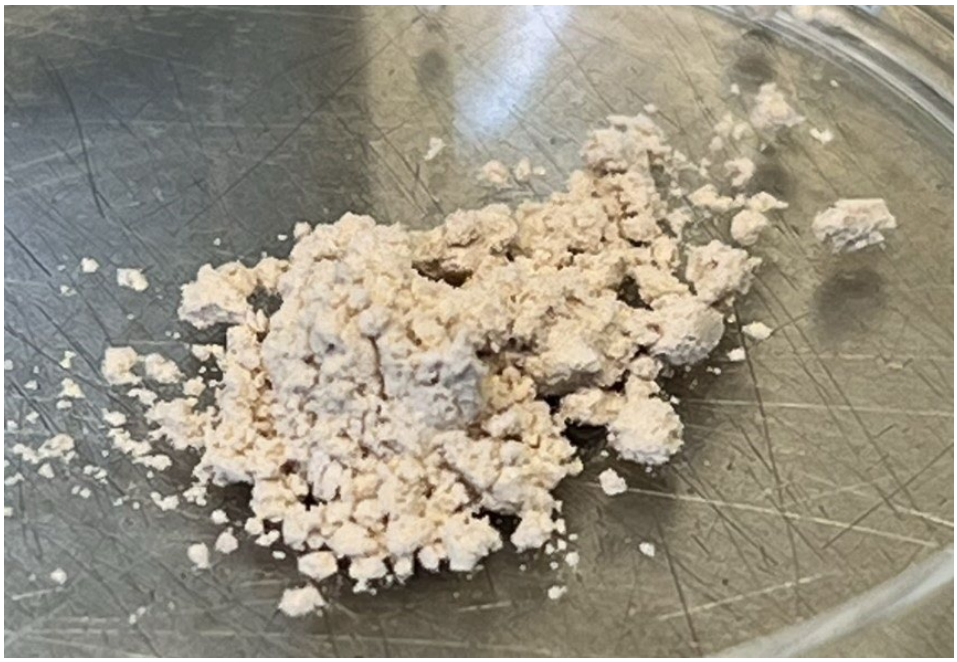

647186-9, 9A, 9B/05162023-9

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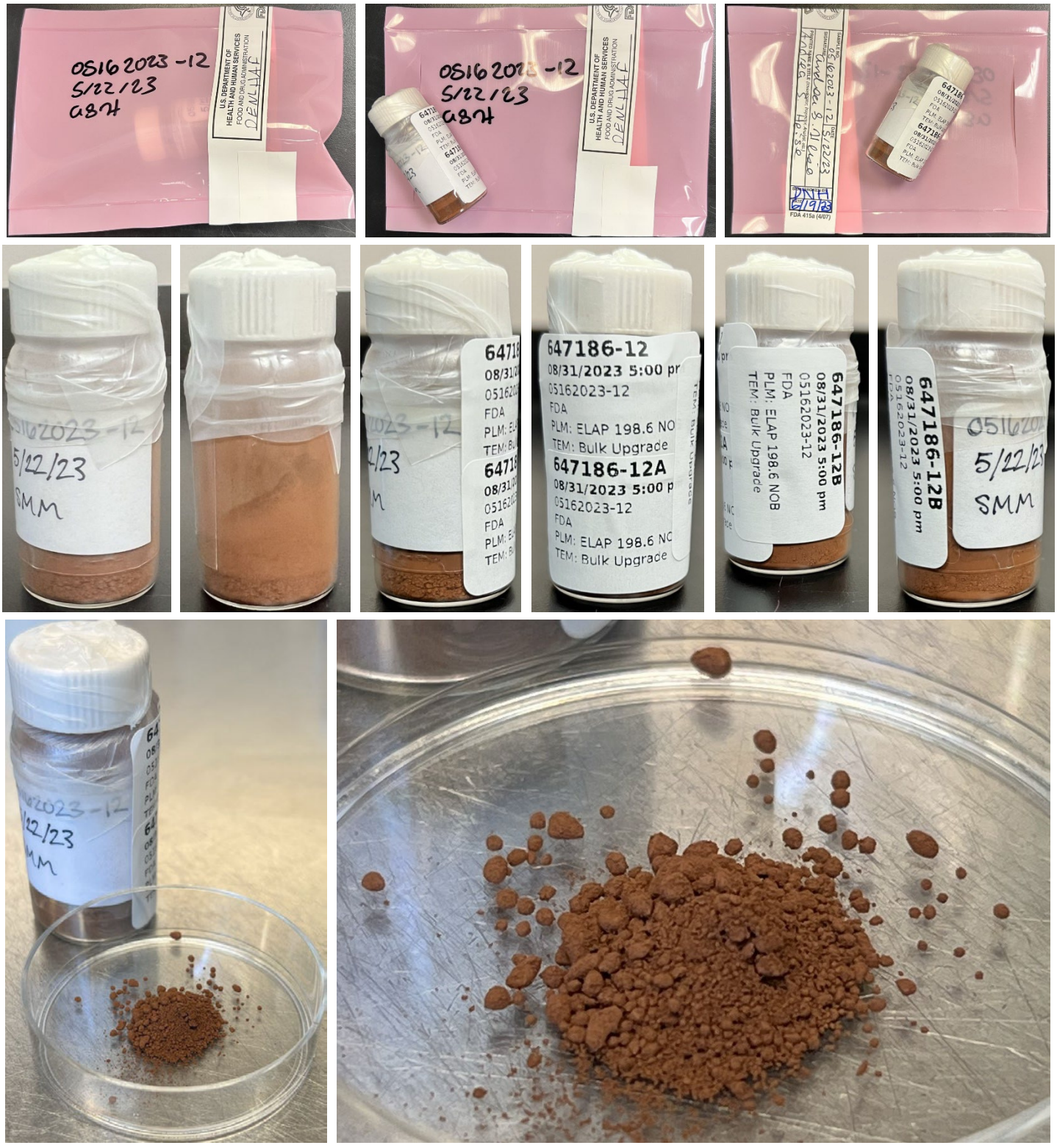
647186-11, 11A, 11B/05162023-11

647186-12, 12A, 12B/05162023-12



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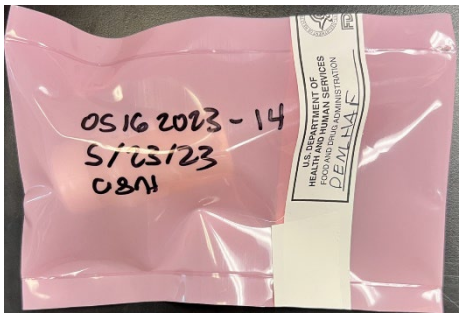
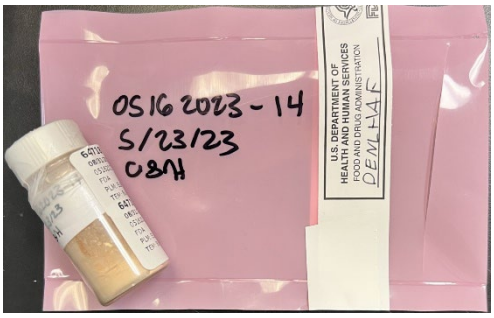
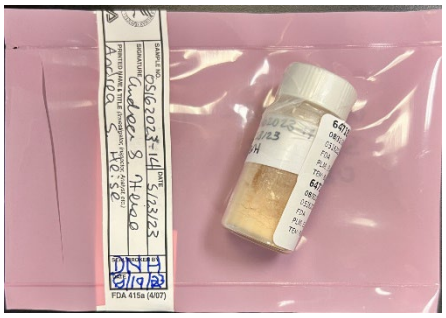
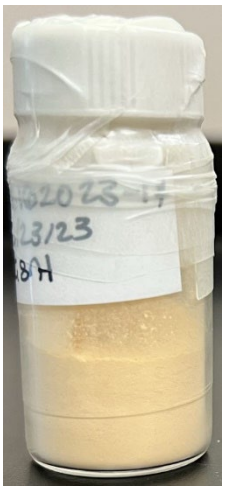
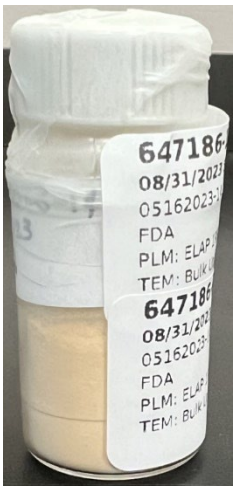
647186-14, 14A, 14B/05162023-14

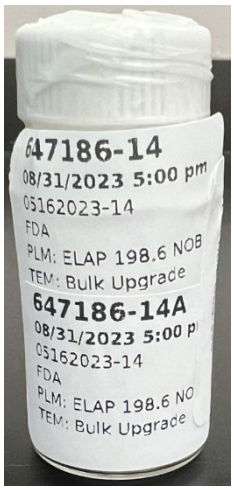


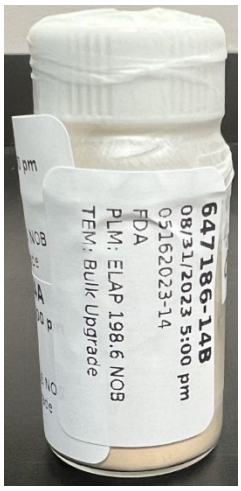


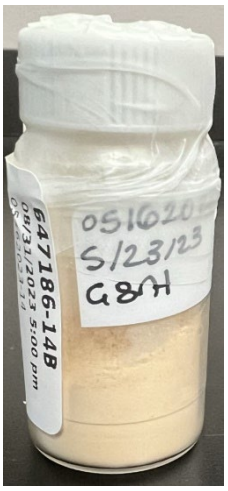


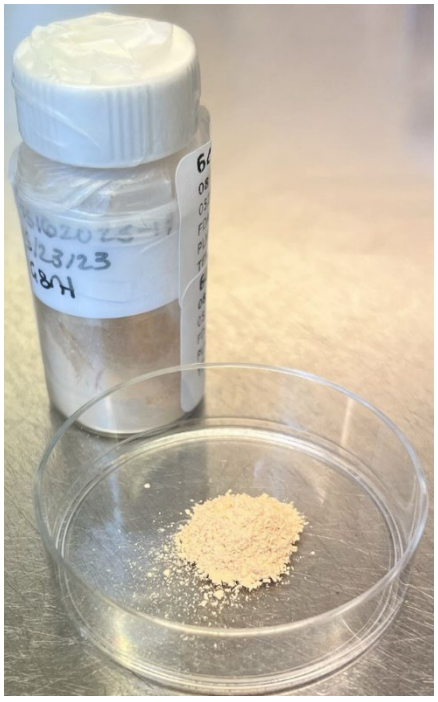


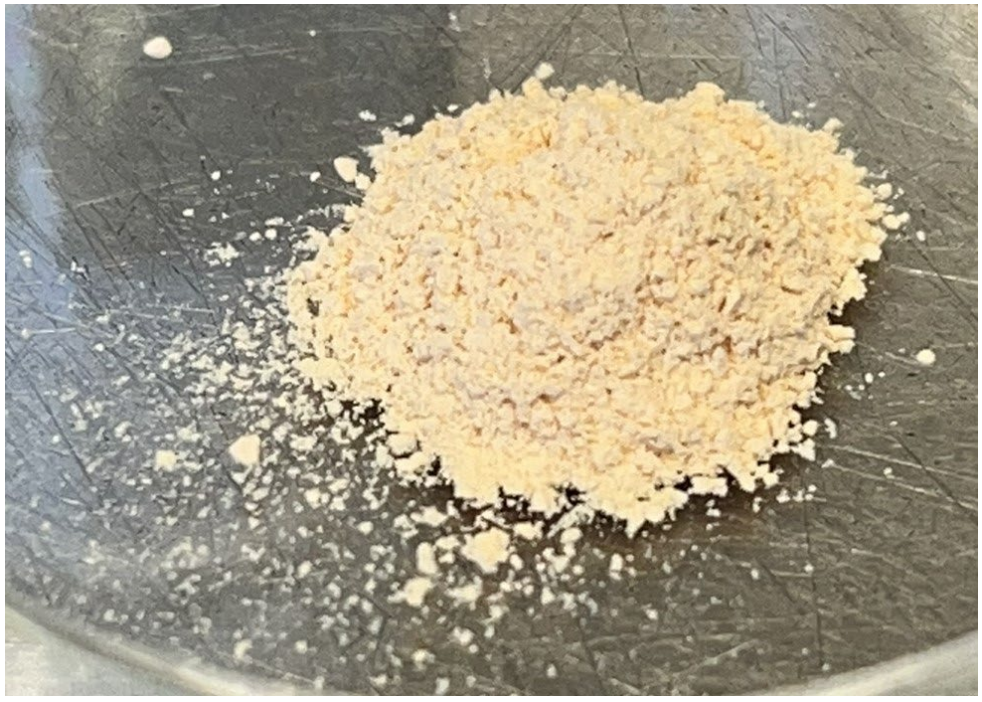




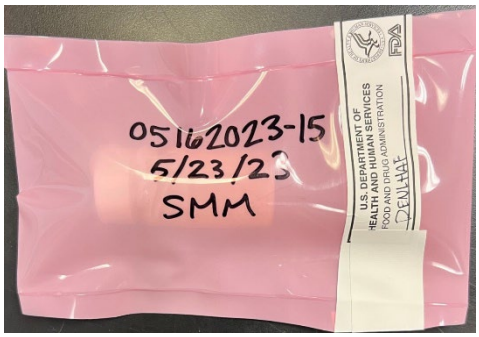


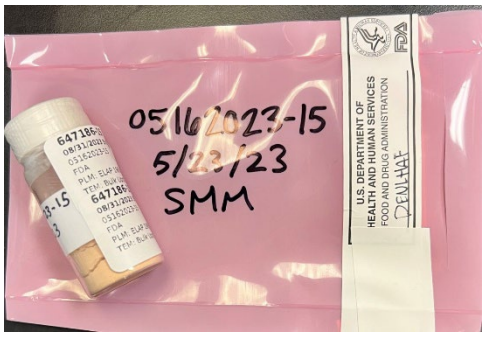


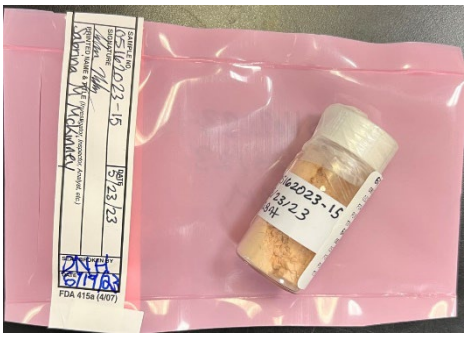


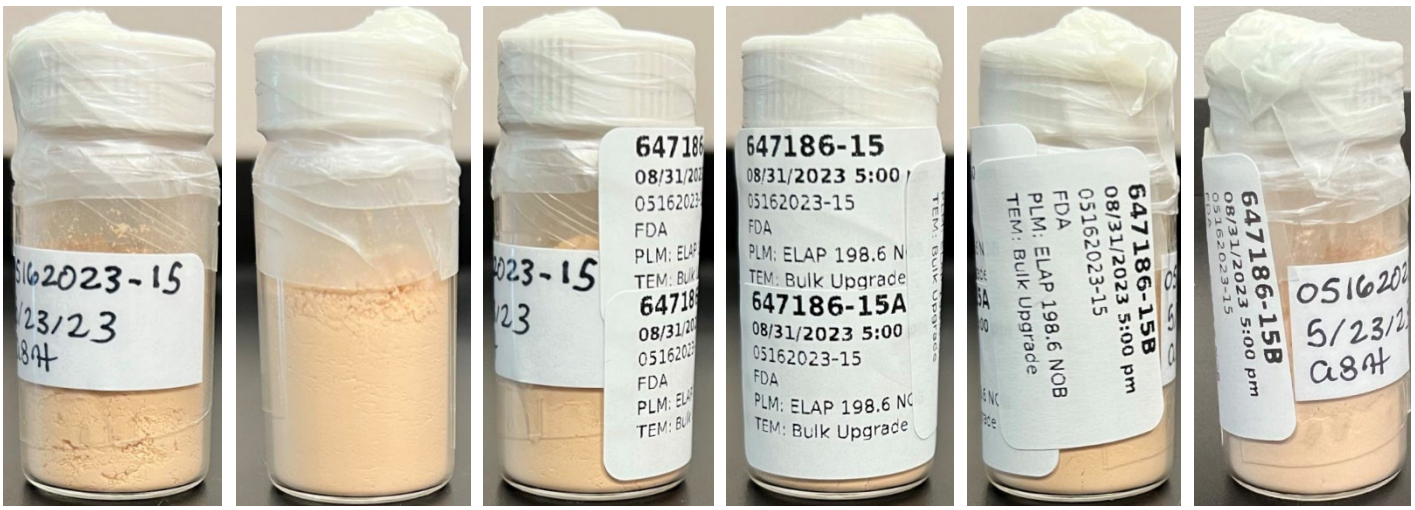


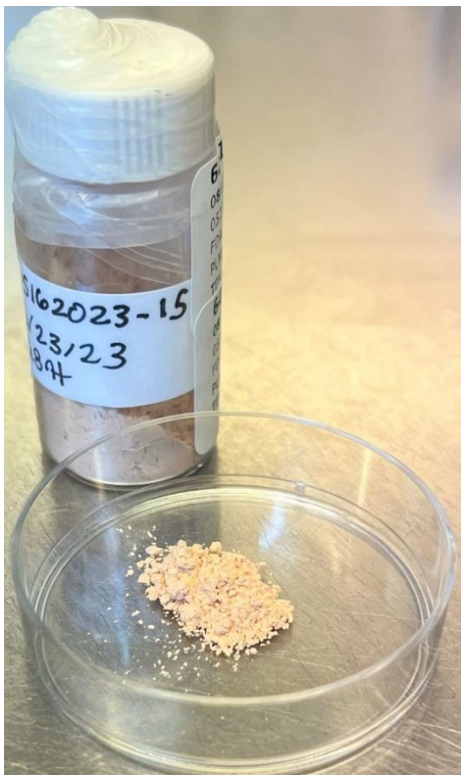
647186-15, 15A, 15B/05162023-15

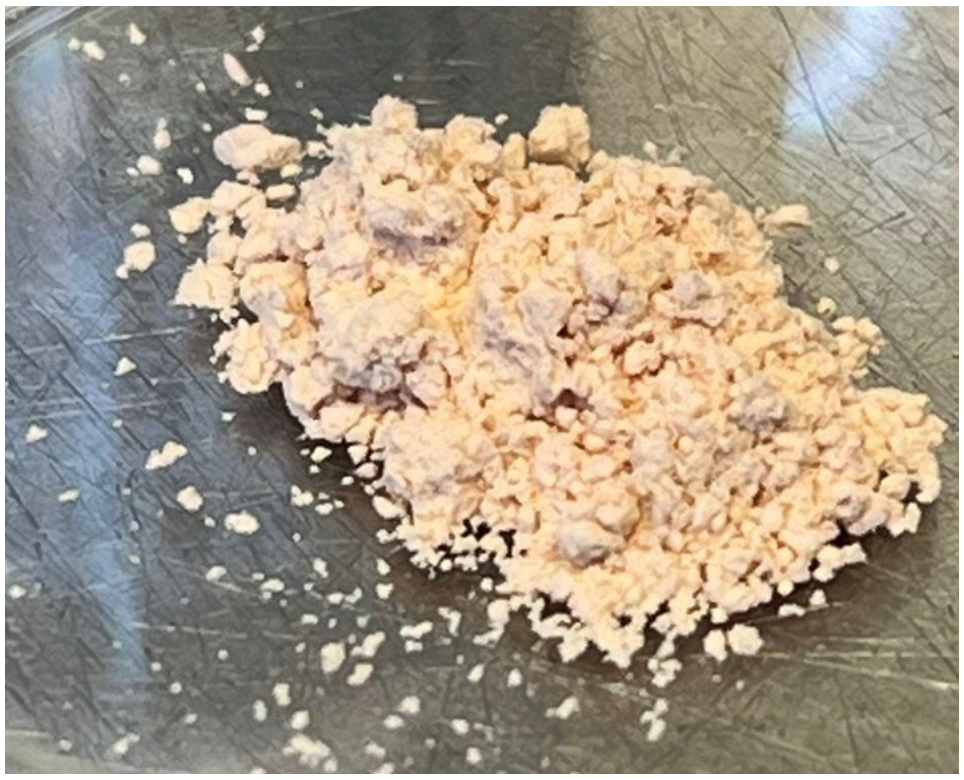




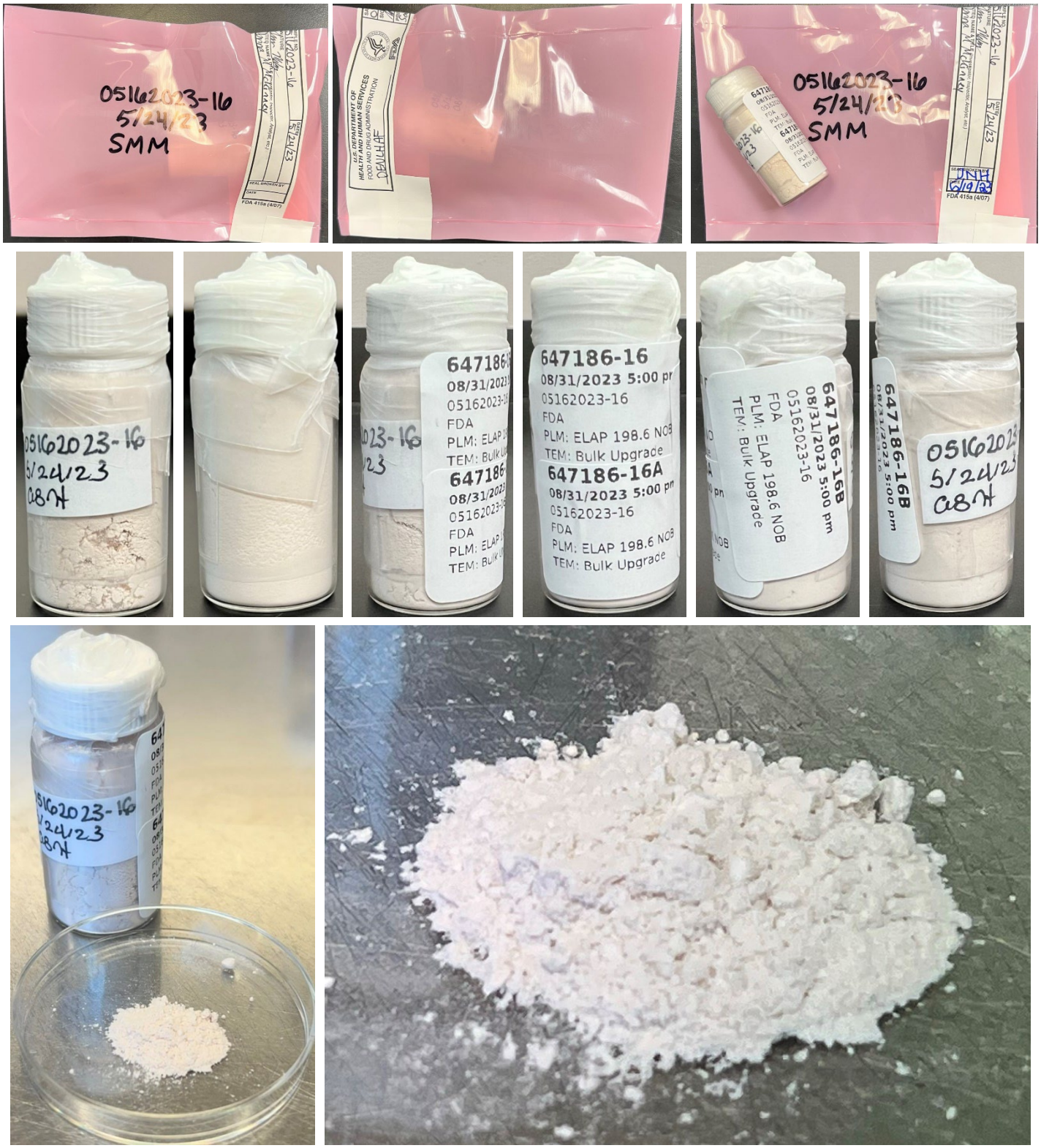




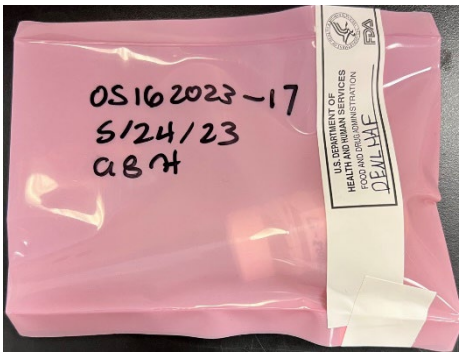


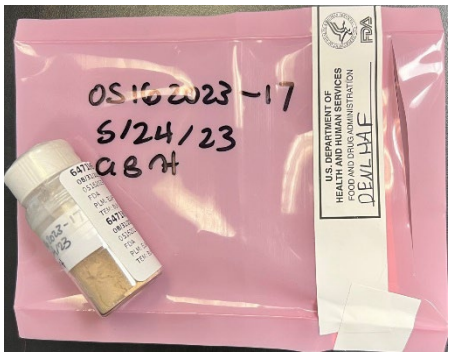


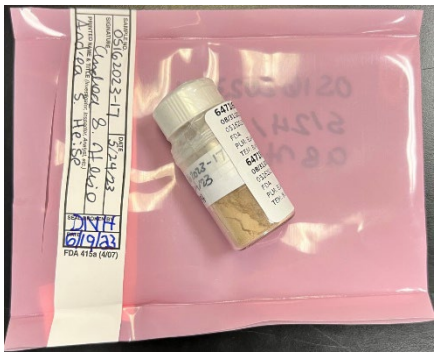
647186-16, 16A, 16B/05162023-16

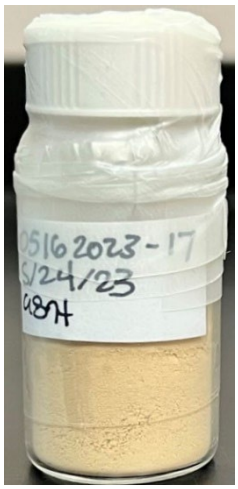


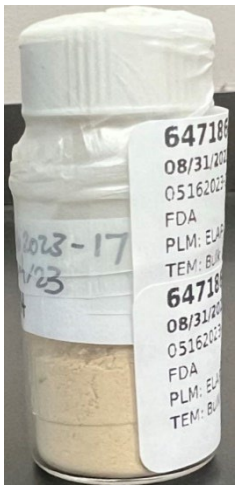
647186-17, 17A, 17B/05162023-17

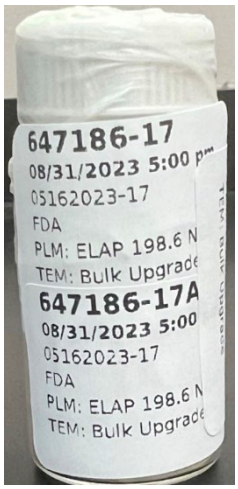


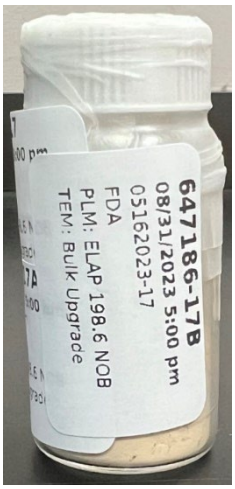


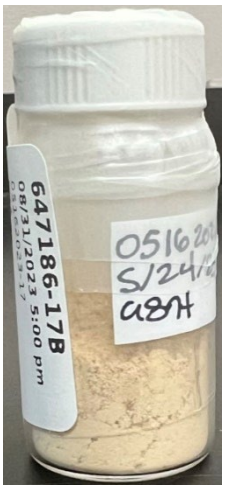


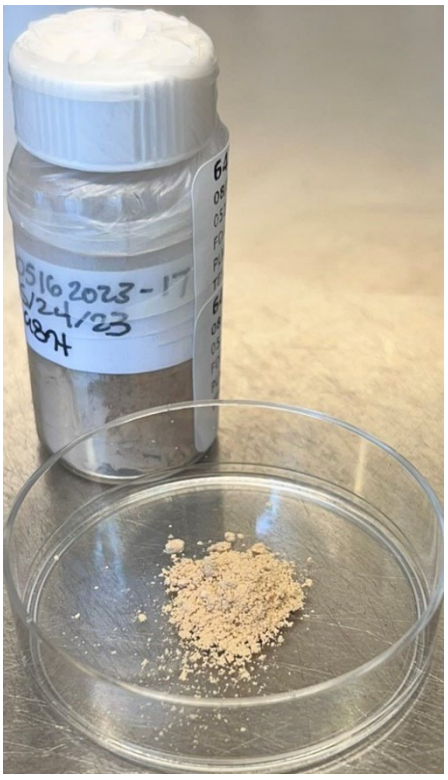


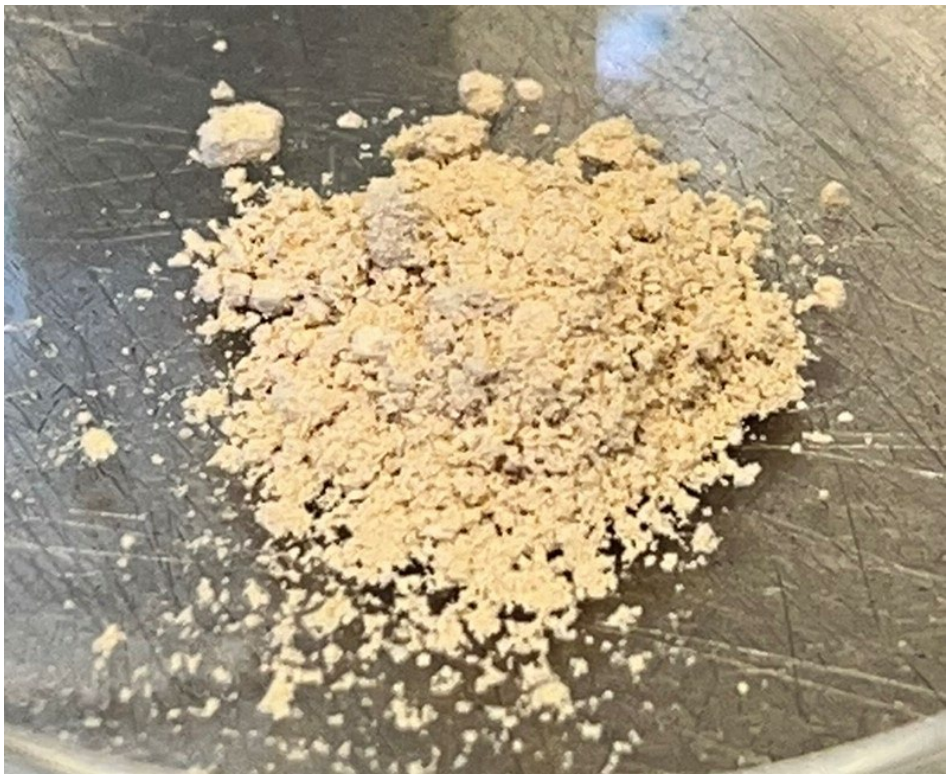




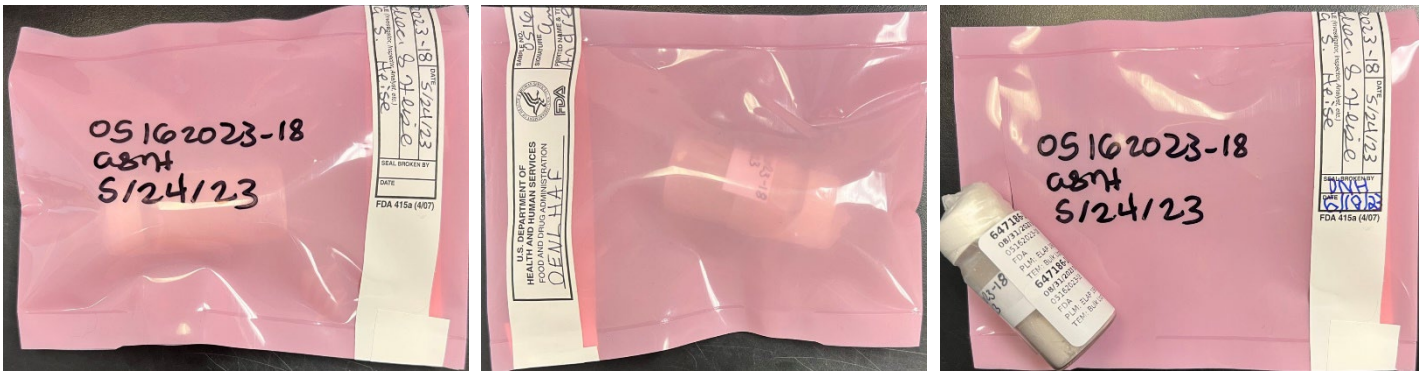


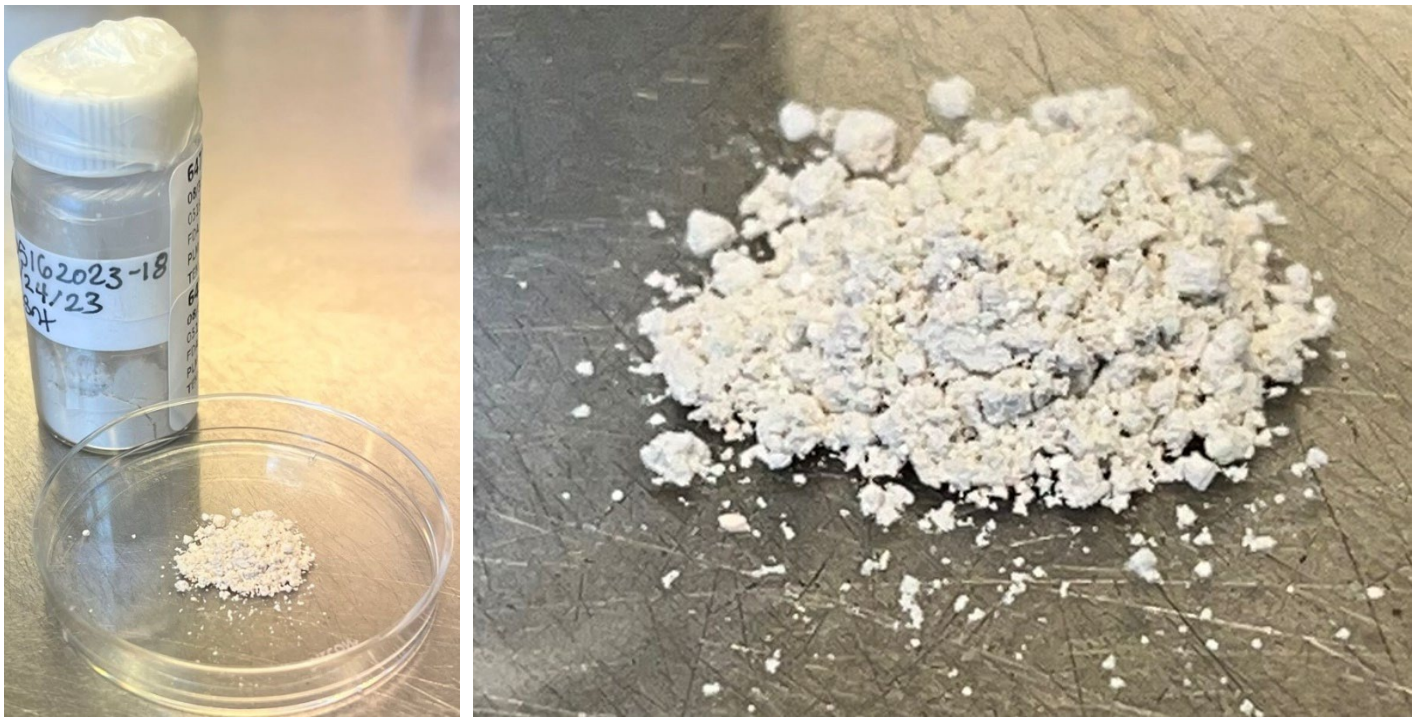






647186-18, 18A, 18B//05162023-18





647186-19, 19A,19B/05162023-19

Sample Preparation

Samples were gravimetrically reduced and filtered by (b) (6) on: August 8, 2023 through August 11, 2023 for 647186-1 through 647186-4B, and NB23-439/440; August 14, 2023 through August 16, 2023 for 647186-5 through 647186-8B, 647186-22RQC, and NB23-448/449; August 17, 2023 through August 21, 2023 for 647186-9 through 647186-12B, and NB23-452/453; August 22, 2023 through August 23, 2023 for 647186-13 through 647186-16B, and NB23-391/392; and August 19, 2023 through August 21, 2023 for 647186-14 through 647186-17B, 647186-22RQC, and NB23-458/459; August 23, 2023 through August 29, 2023 for 647186-17 through 647186-19B, 647186-20DQC, and NB23-467/468; and August 28, 2023 through August 29, 2023 for 647186-21RQC and NB23-470/471. PLM slide preparations were made by (b) (6) on: August 9, 2023 for 647186-1 through 647186-4B, and NB23-440; August 15, 2023 for 647186-5 through 647186-8B, 647186-22RQC, and NB23-449; August 18, 2023 for 647186-9 through 647186-12B, and NB23-453; August 23, 2023 for 647186-13 through 647186-16B, and NB23-459; August 28, 2023 for 647186-17 through 647186-19B, 647186-20DQC, and NB23-468; and August 29, 2023 for 647186-21RQC and NB23-471. TEM grid preparations were made by: (b) (6) on August 11, 2023 for 647186-1 through 647186-4B, and NB23-439; (b) (6) on August 17, 2023 for 647186-5 through 647186-8B, 647186-22RQC, and NB23-448; (b) (6) on August 22, 2023, for 647186-9 through 647186-12B, and NB23-452; (b) (6) on August 24, 2023 for 647186-13 through 647186-16B, and NB23-458; (b) (6) on August 29, 2023 for 647186-17 through 647186-19B; and (b) (6) on August 30, 2023 for 647186-20DQC, 647186-21RQC, NB23-467, and NB23-471. Sample preparation consisted of the following steps:

1) Label and weigh two 8mL glass vials for each sample in the set – one vial for the PLM preparation and one vial for the TEM preparation.
2) Weigh out 0.1 to 0.8-grams of material and place in the corresponding 8mL glass vial. Record weight.
3) Burn samples at 480° C for at least 12-hours.
4) Record Post-Ash weight.
5) Treat ashed sample with reagent grade hydrochloric acid.
6) Filter acid reduced material with a pre-weighed disposable filtration apparatus onto a 47mm 0.4µm PolyCarbonate filter.
7) Place disposable filtration apparatus with filter into drying oven for 3 hours and then record Post-Acid Reduced weight.
8) Make four PLM slide preparations from the PLM residue for each sample in 1.550 dispersion oil. Make additional preparations in 1.605, 1.625, 1.680 and 1.700 dispersion oil(s) as necessary for particle identification.
9) Weigh a portion of the material from the TEM residue and place it into the corresponding pre-weighed 100mL jar.
10) Fill the 100mL jar with deionized water.
11) Sonicate the jar for ~5-minutes.
12) Filter 0.1mL to 2mL of the solution onto a 47mm 0.22µm MCE filter.
13) Dry the filter for ~10-minutes then collapse, carbon coat, and place on a 3 TEM grids.

TEM grid preparations were examined prior to analysis and were rejected if they met the following criteria:

1) Less than 50% of the carbon coating was intact.
2) The grid was too dark due to incomplete dissolution of the filter.
3) Heavy particulate loading in excess of 25%
4) Light particulate loading below 10%
5) Uneven distribution of particulate

<u>Problems Encountered During Preparation & Resolutions:</u>
No problems were encountered during preparation. All gravimetric data was consistent among each group of aliquots and all TEM grid preparations were deemed acceptable for analysis.

PLM Analysis

Analysis was performed in accordance with NY ELAP 198.6 protocols. The analysis was conducted using an Olympus BH-2 polarized light microscope (PLM) equipped with a dispersion staining objective. All four slide preparations for each aliquot were examined; each slide preparation consisted of two (2) coverslips for a total of eight (8) coverslips. 400-point count was performed for those samples on which asbestos was observed. If no asbestos was detected on any of the slides, the percentage of fibrous components was determined by visual estimation. The results of this analysis are detailed below in the section for each individual sample.

Point Counting

If asbestos was observed on the slide preparations, the amount of asbestos was quantified using point count techniques. Point counting is a form of quantifying PLM samples. One of the oculars of each PLM microscope is etched with a crosshair. When point counting, whatever is under the crosshair is counted as one point of whatever the material is. Four (4) slide preparations with a total of eight (8) coverslips are prepared for each sample. The microscope mechanical stage is used to randomly move the slide. After each movement, whatever is under the crosshair, provided the point is not empty, is counted. Fifty (50) non-empty points are counted on each of the eight (8) coverslips for a total of four hundred (400) points. The total asbestos points counted are divided by the total points counted to calculate the percentage.

Example:

11 points of asbestos were counted out of the 400 total points

Slide percentage = (11pts/400pts) * 100%
Slide percentage = 2.75%

This number is not the final asbestos percentage. To calculate the final percentage, this number must be corrected to account for the material lost during gravimetric reduction preparation. See the *Calculations* section below for additional details.

TEM Analysis

Analysis was performed in accordance with modified NY ELAP Method 198.4 protocols. The analysis was performed using either a JEOL JEM-100CX II transmission electron microscope (TEM) equipped with ThermoFisher NSS System 7 Energy Dispersive X-Ray Analyzer (EDXA) or a JEOL 1400 Flash equipped with ThermoFisher Pathfinder Energy Dispersive X-Ray Analyzer (EDXA), at magnifications of 19,000x or 20,000x. All TEM scopes are equipped with a Selective Area Electron Diffraction (SAED) setting that allows the operator to view the diffraction pattern of any mineral substance. Twenty (20) grid openings over two (2) grids were examined for each aliquot.

Modifications to the NY ELAP 198.4 Method were:

1) The residue was not placed in alcohol and prepared using the quick drop method. To obtain a more uniform preparation, the residue was placed in a jar and filled with 100mL of deionized water. The jar was sonicated, and a portion of the solution was filtered onto a 47mm 0.22µm MCE filter.
2) Any amphibole or chrysotile particle(s) observed were not quantified by visual estimation. The length and width of the observed particle(s) were measured, and the mass of each amphibole and chrysotile particle was calculated using the ASTM D5756 method.
3) All particles identified as amphibole were included with the counts/concentrations, regardless of size and aspect ratio.

The results of this analysis are detailed below in the *Discussion and Interpretation of Analytical Findings* section for each individual sample.

Calculations

TEM ASTM D5756 Mass:

$M = \pi/4\ L * W^2 * D * 10^{-12}$

Where: M: Mass
L: Length
W: Width
D: Density

Gravimetric Reduction Percentages:

Organic: ((W1 – W2) * 100/W1

Acid Soluble: ((W2 – W3) * 100/W1

Other* Percent: ((W3/W1) * 100) – Calculated Asbestos %

*Other is defined as the non-asbestos, inorganic, acid insoluble portion of the sample

Where: W1: Weight of sample prior to ashing/acid wash
W2: Weight of sample after ashing
W3: Weight of sample after acid treatment

Asbestos Percent Calculation:

TEM

$$\frac{EFA(mm^2) * 100ml * MA(g) * RW(g)}{VF(ml) * IW(g) * AA(mm^2) * RJ(g)}$$

(The calculated TEM value is then multiplied by 100 to convert it to percent)

Where: EFA: Effective filter area
MA: Mass of asbestos
RW: Weight of residue
VF: Volume filtered
IW: Initial weight of the sample
AA: Area analyzed
RJ: Weight of residue placed into the jar

PLM

(ASB * W3)/W1

Where: W1: Weight of sample prior to ashing/acid wash
W3: Weight of sample after acid treatment
ASB: Calculated Point Count Result

Note: All reported concentrations were calculated using the gravimetric data from the TEM preparations.

Limit of Detection and Quantification

We used the mass of a 0.5 x 0.04-micron tremolite fiber as the basis for our calculations. Limit of detection (LOD) was defined as 1 fiber and limit of quantification (LOQ) was defined as 4 fibers.

Two of the samples contained very small amounts of amphiboles that were below our four (4) fiber LOQ. For these aliquots, we defined our LOQ as follows:

6471865-8: mass of the single (1) observed tremolite particle plus the mass of three (3) tremolite fibers measuring 0.5 x 0.04 microns

647186-12: mass of the single (1) observed actinolite particle plus the mass of three (3) tremolite fibers measuring 0.5 x 0.04 microns

Discussion and Interpretation of Analytical Findings

647186-1, 1A, 1B/Client Sample: 05162023-1

PLM

All three aliquots of sample 05162023-1 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-1	No Asbestos Detected
647186-1A	No Asbestos Detected
647186-1B	No Asbestos Detected

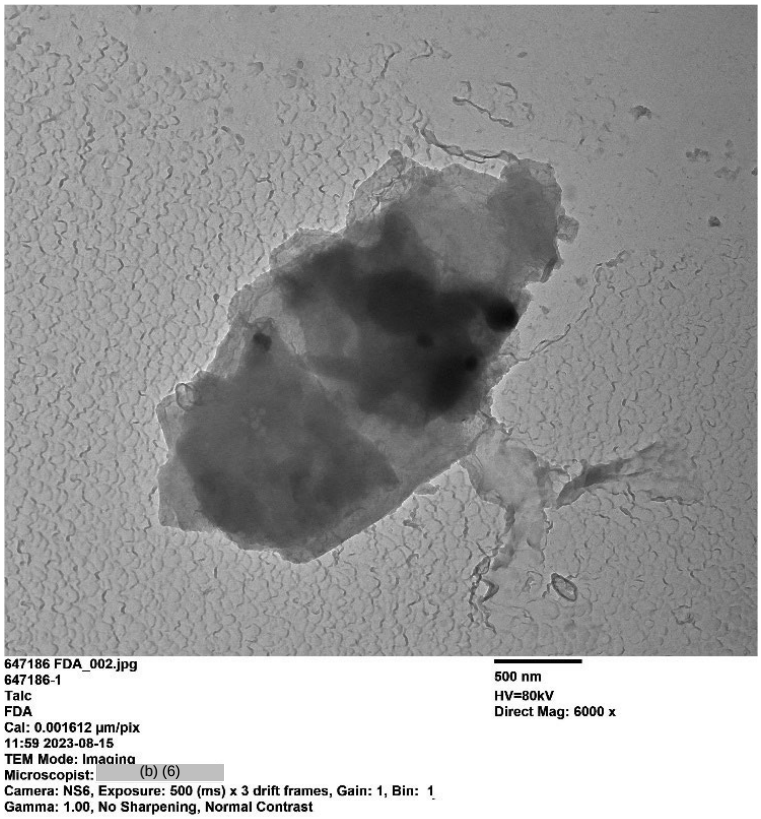
TEM

(b) (6) analyzed aliquot 1 on August 15, 2023. (b) (6) analyzed aliquot 1A on August 21, 2023, and aliquot 1B on August 22, 2023. The primary particles observed were talc and titanium; mica particles were also observed along with talc ribbons/fibers, iron particles, silica spheres, and particles containing aluminum and silicon. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

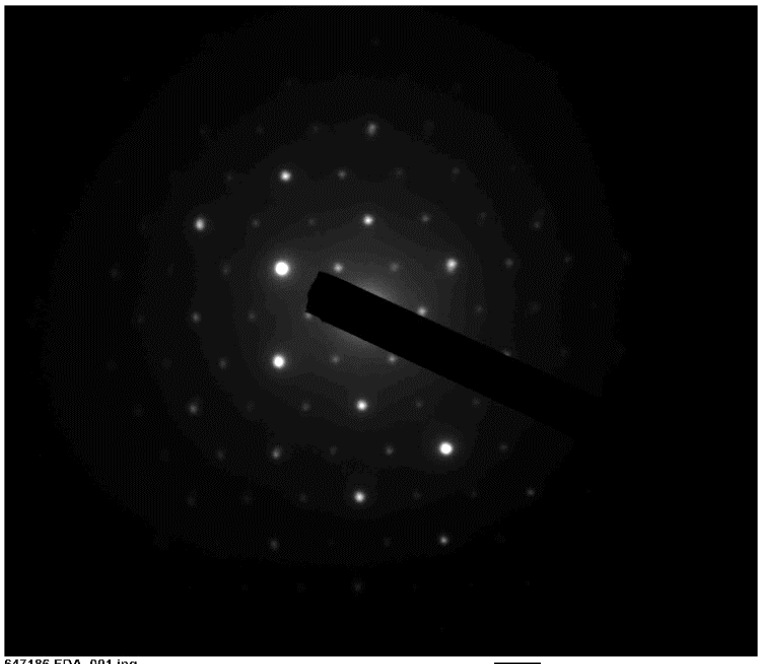
647186-1	No Asbestos Detected
647186-1A	No Asbestos Detected
647186-1B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

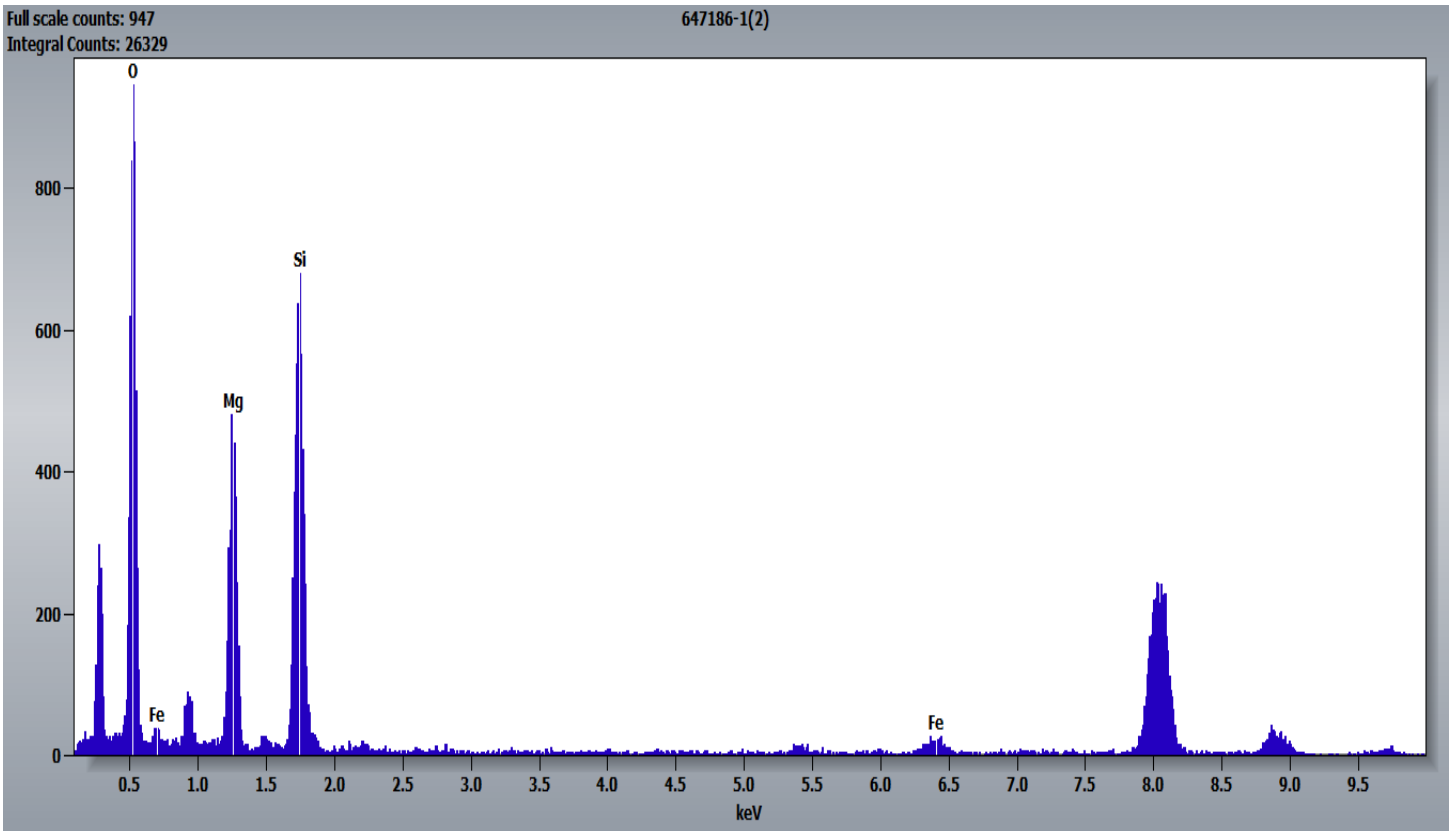
647186-1, Talc Particle



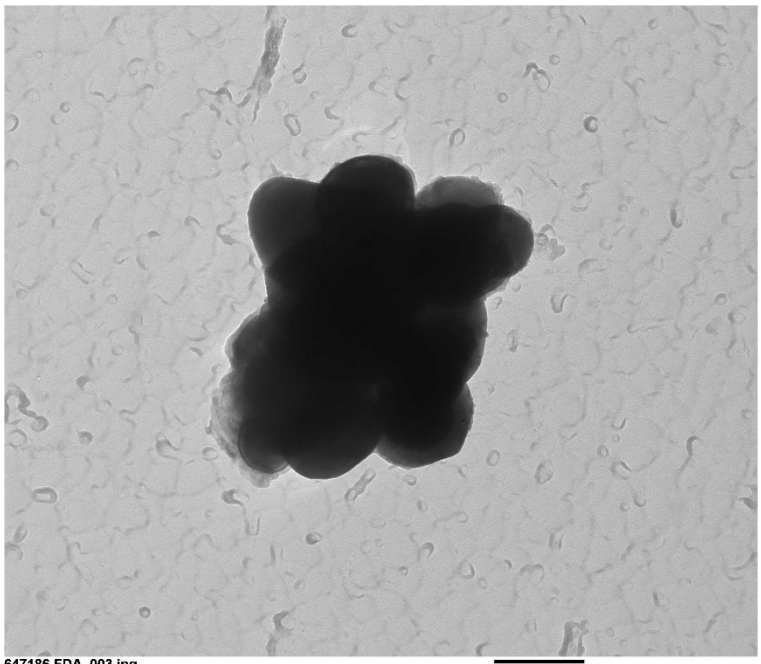
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



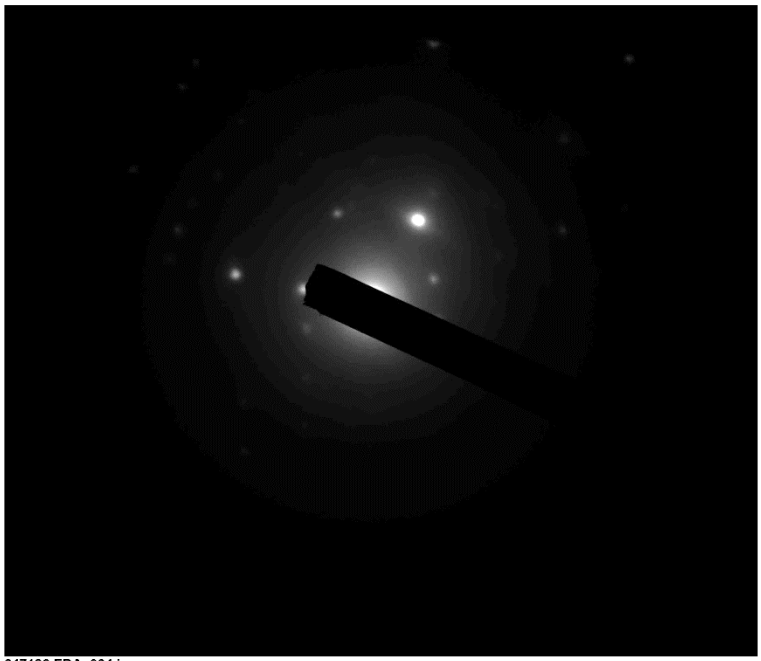
647186-1, Titanium Particles



647186 FDA_003.jpg
647186-1
Titanium particles
FDA
Cal: 0.000626 µm/pix
12:00 2023-08-15
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 15000 x

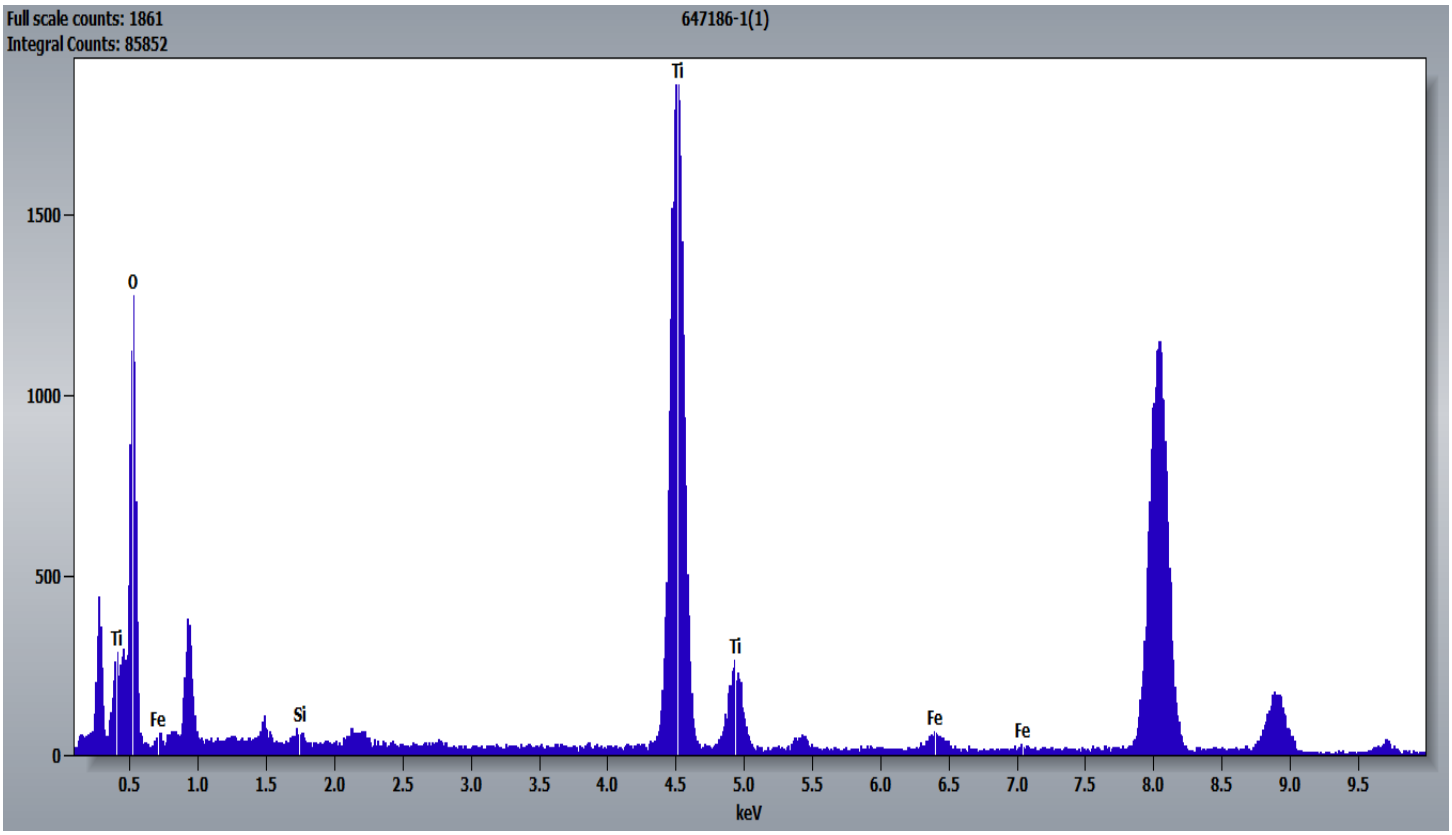
Diffraction Pattern from the Titanium Particles Pictured Above



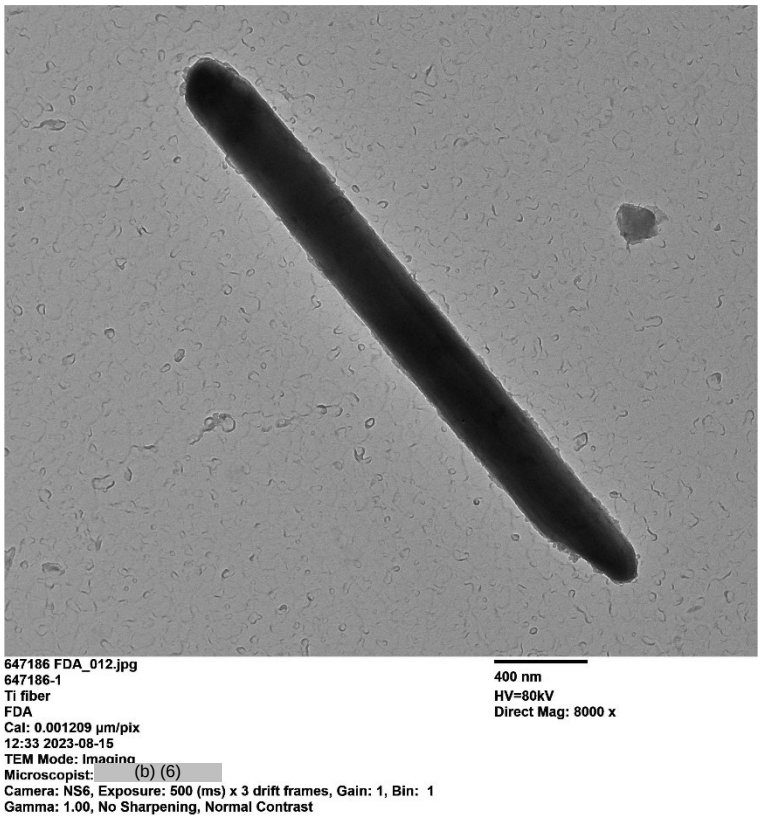
647186 FDA_004.jpg
647186-1
Titanium particles
FDA
Cal: 0.000626 µm/pix
12:01 2023-08-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Titanium Particles Pictured Above

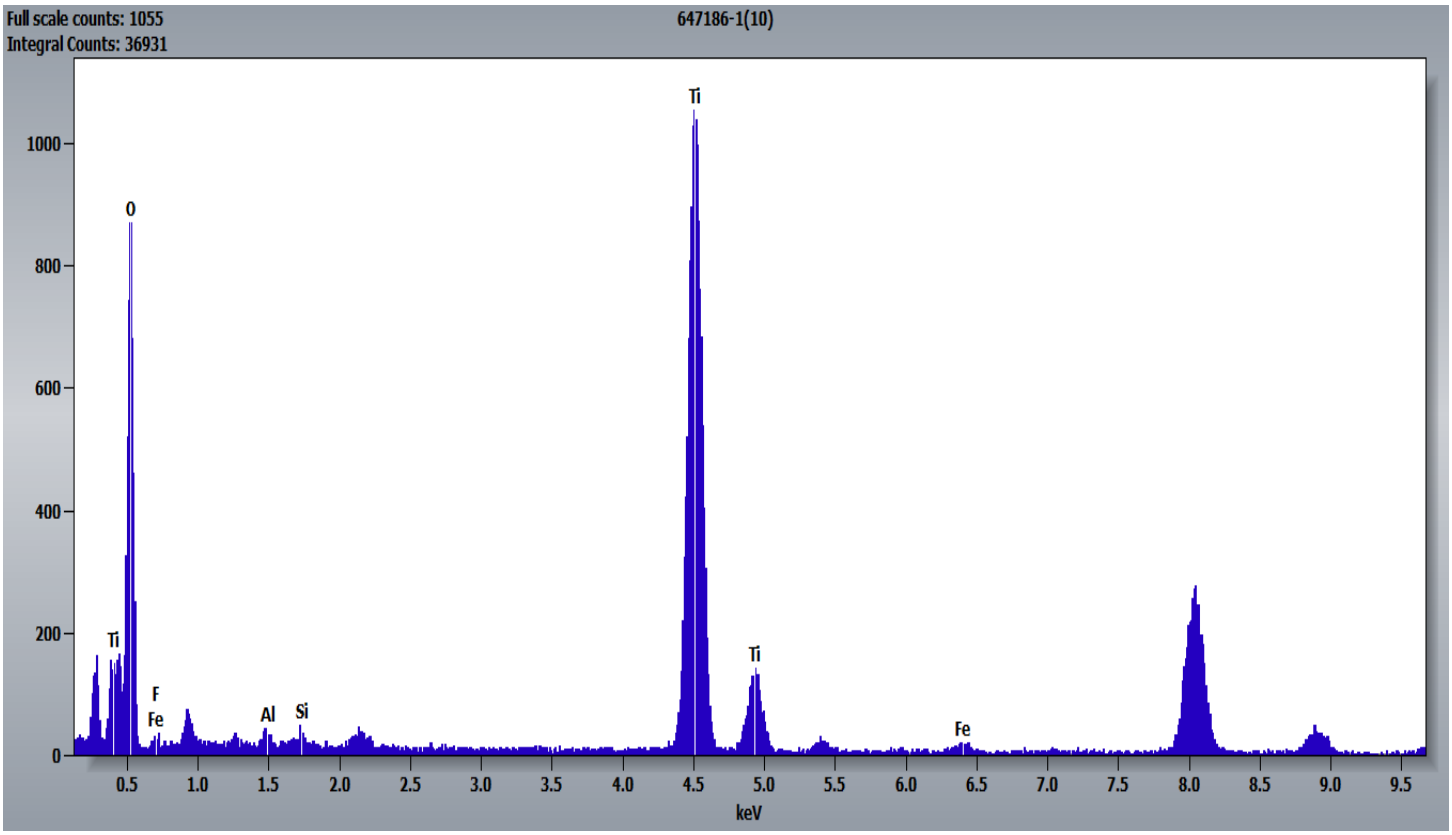


647186-1, Elongated Titanium Particle

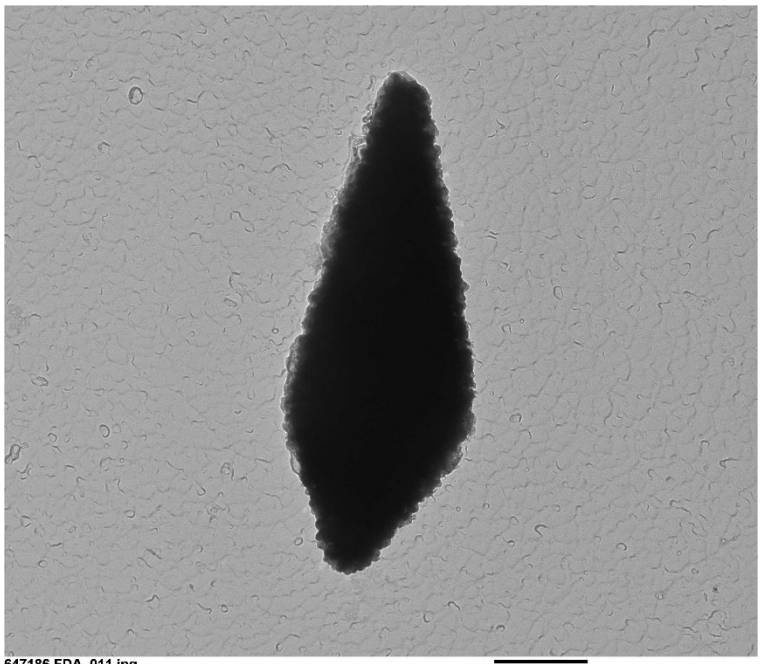


Diffraction Pattern from the Elongated Titanium Particle Pictured Above

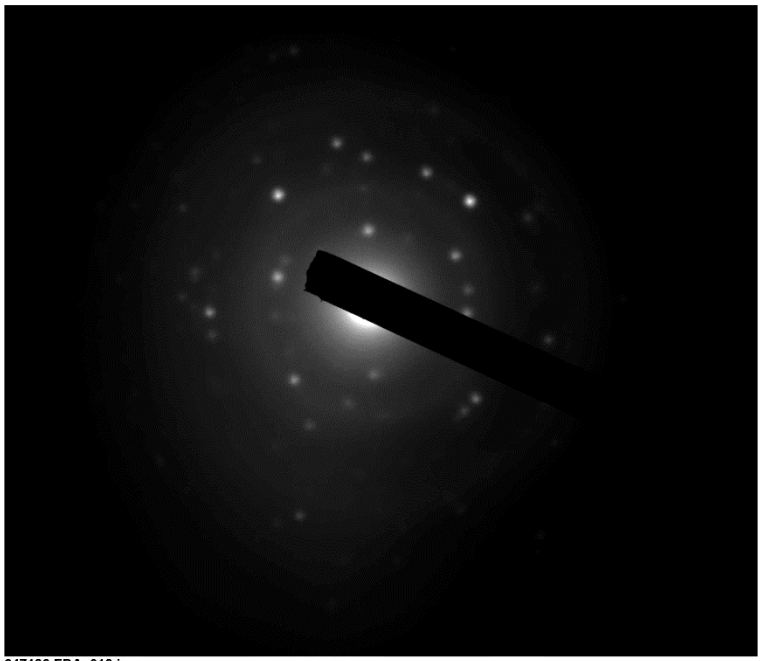
Chemistry from the Elongated Titanium Particle Pictured Above



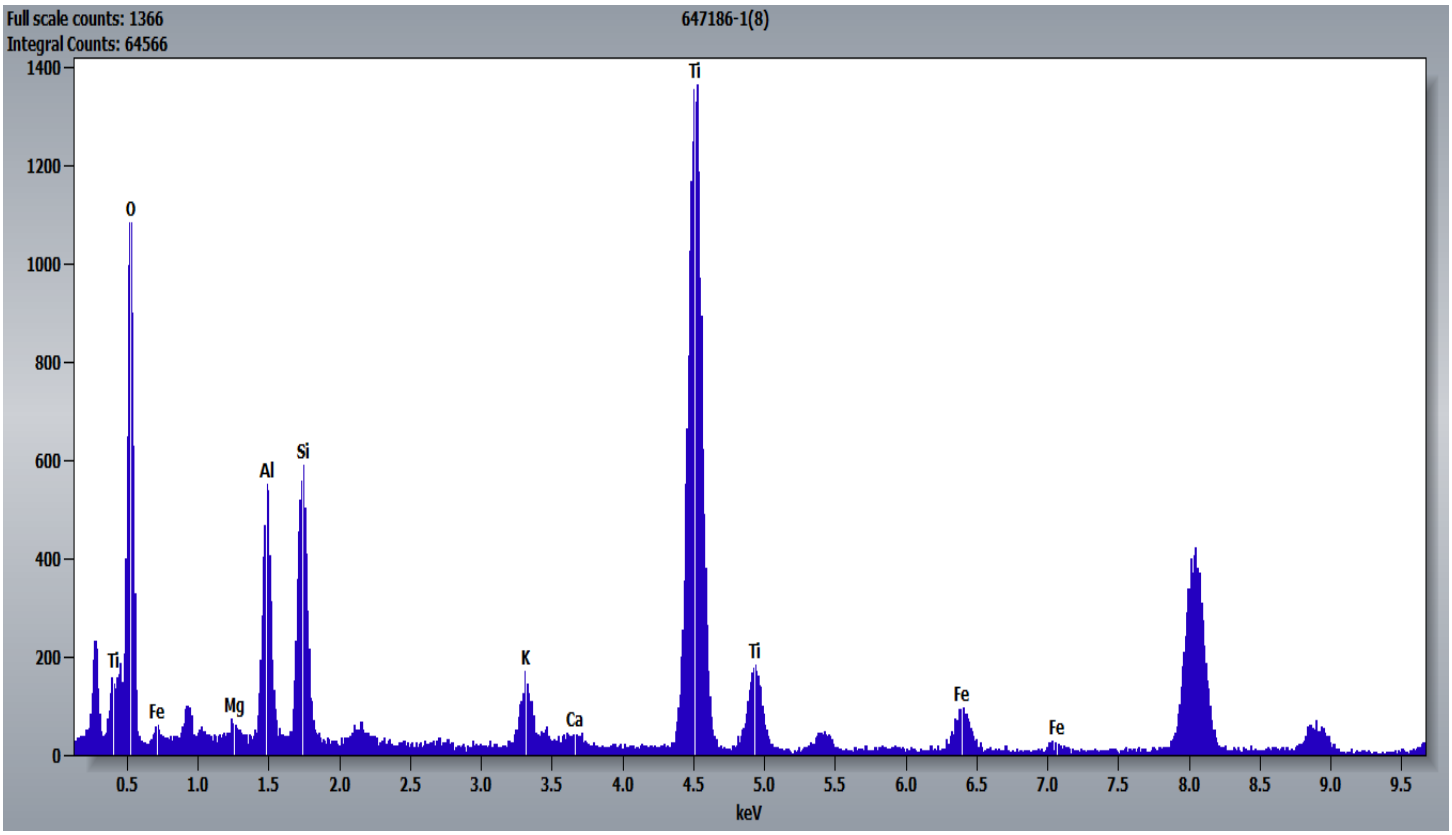
647186-1, Mica Particle with Titanium



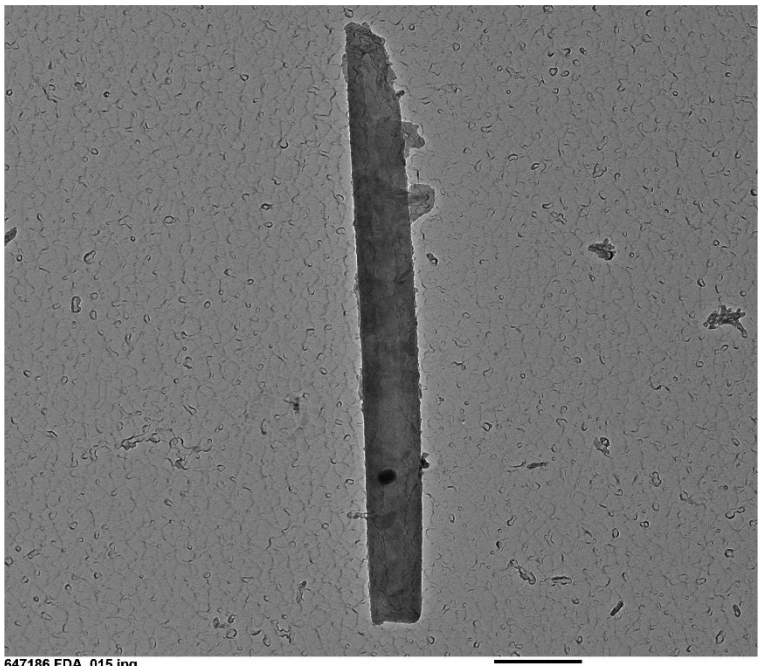
Diffraction Pattern from the Mica Particle with Titanium Pictured Above



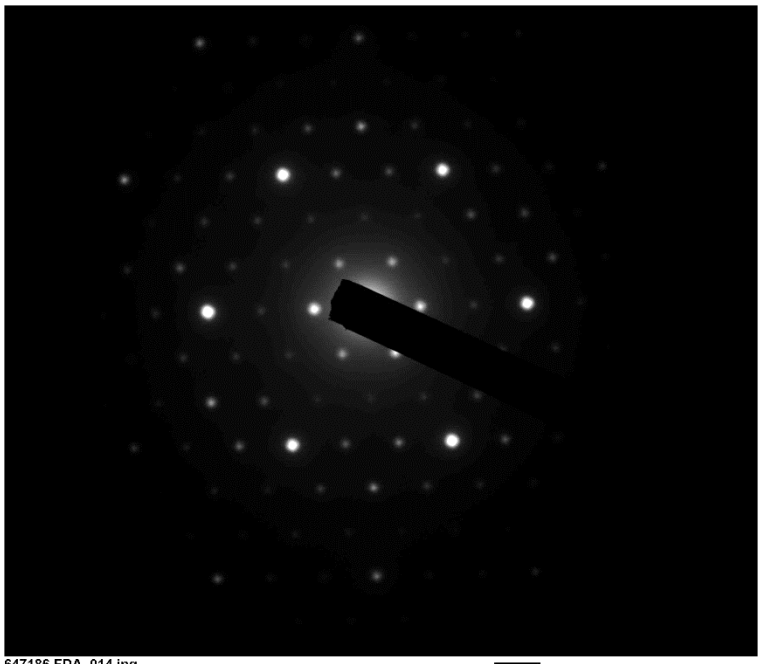
Chemistry from the Mica Particle with Titanium Pictured Above



647186-1, Elongated Talc Particle



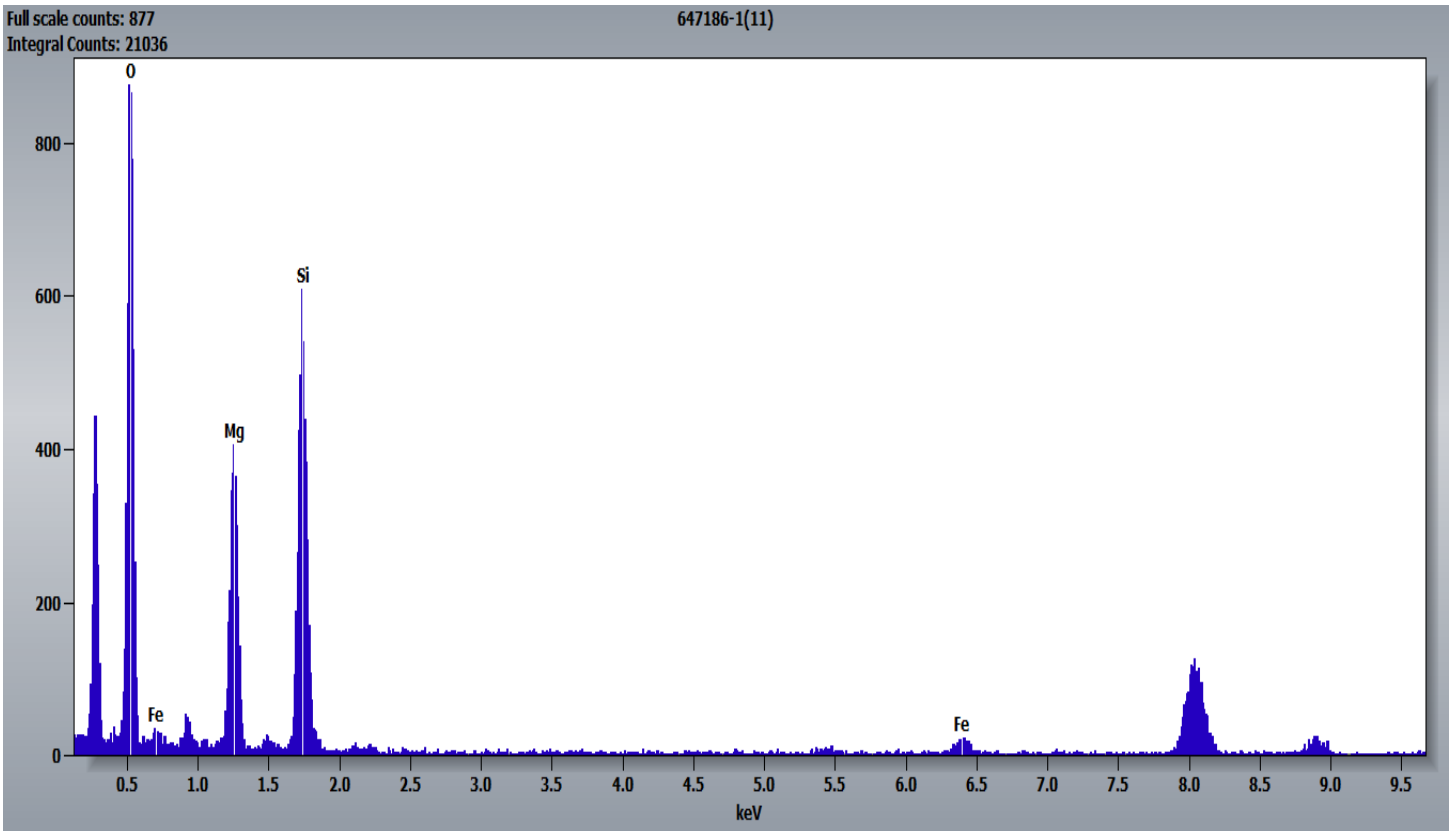
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



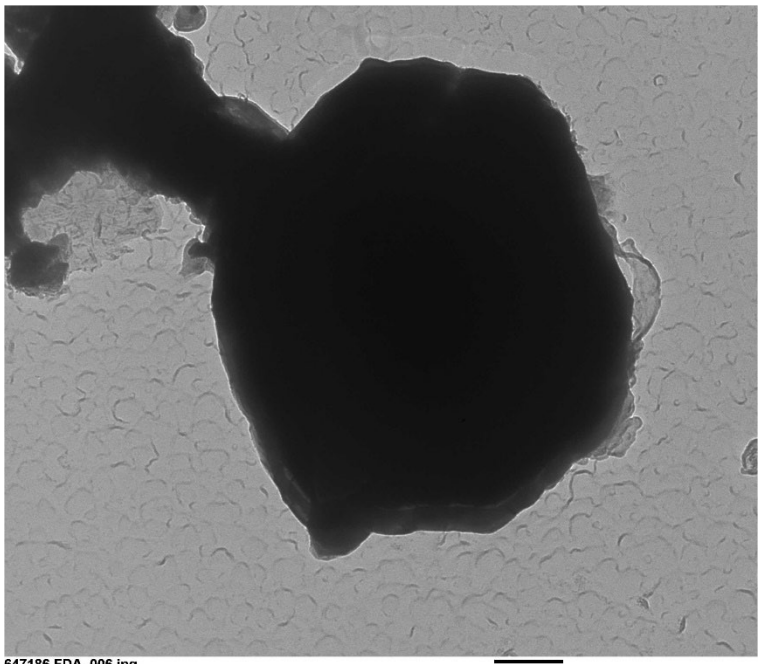
647186 FDA_014.jpg
647186-1
Talc Fiber
FDA
Cal: 0.001209 µm/pix
12:45 2023-08-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Talc Pictured Above



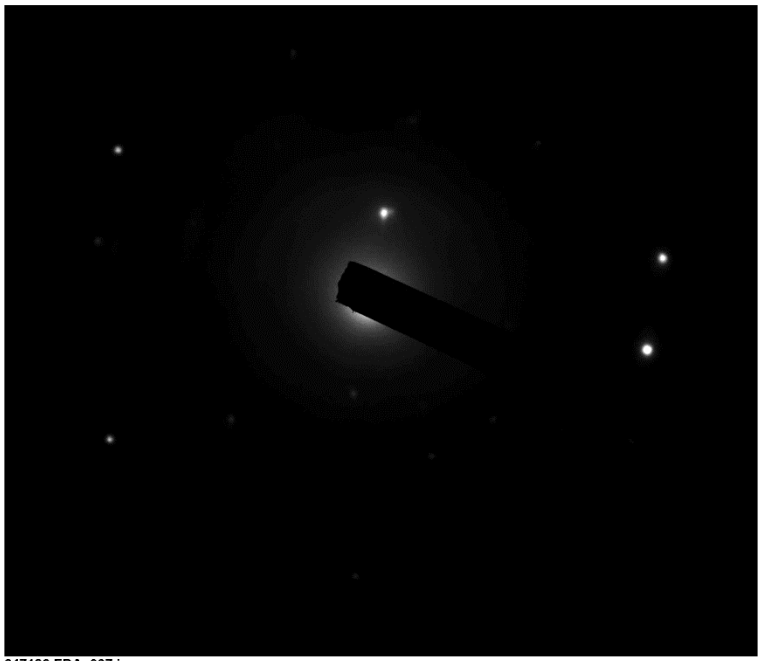
647186-1, Iron Particle



647186 FDA_006.jpg
647186-1
Fe particle
FDA
Cal: 0.000817 µm/pix
12:11 2023-08-15
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 12000 x

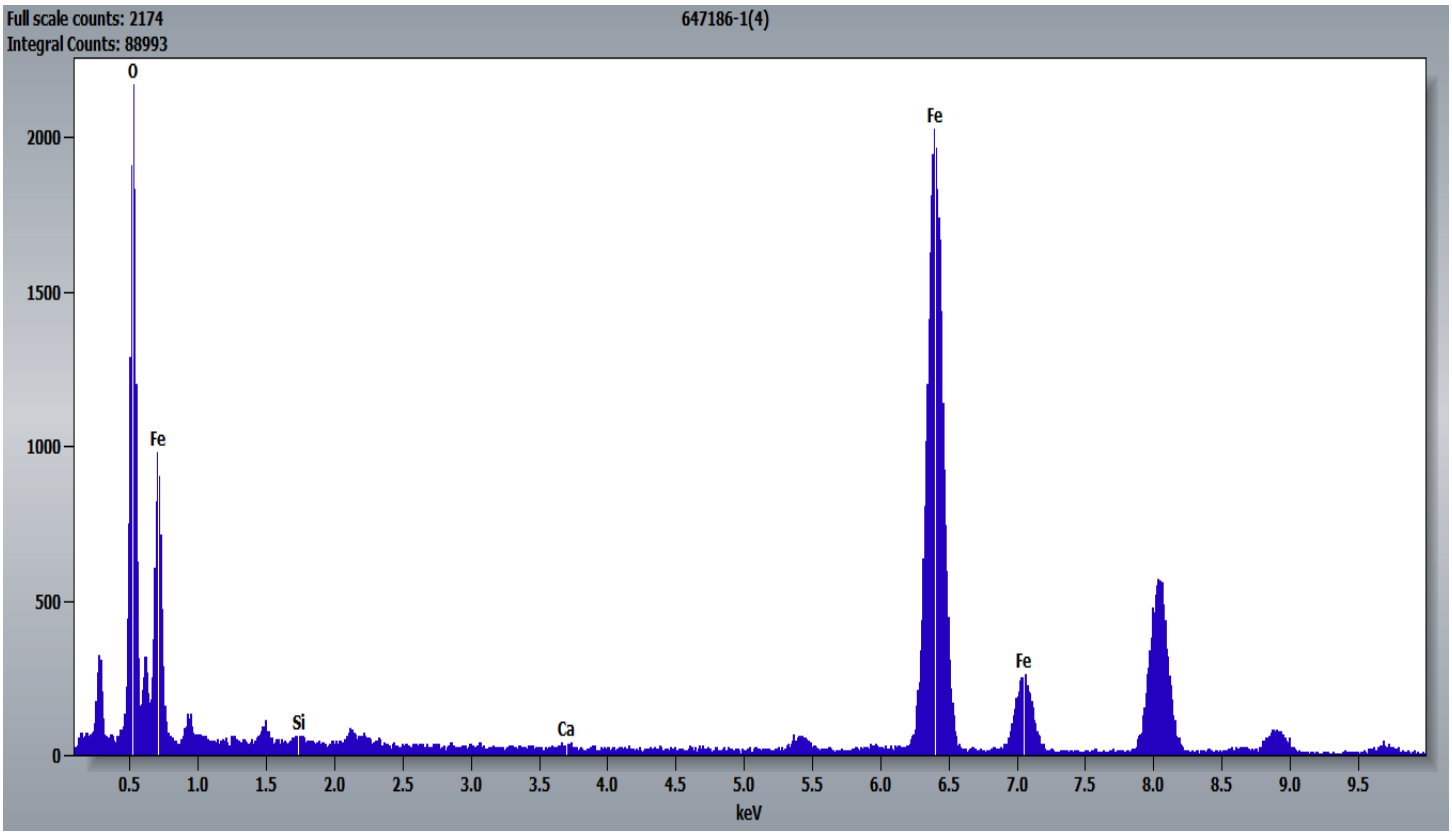
Diffraction Pattern from the Iron Particle Pictured Above



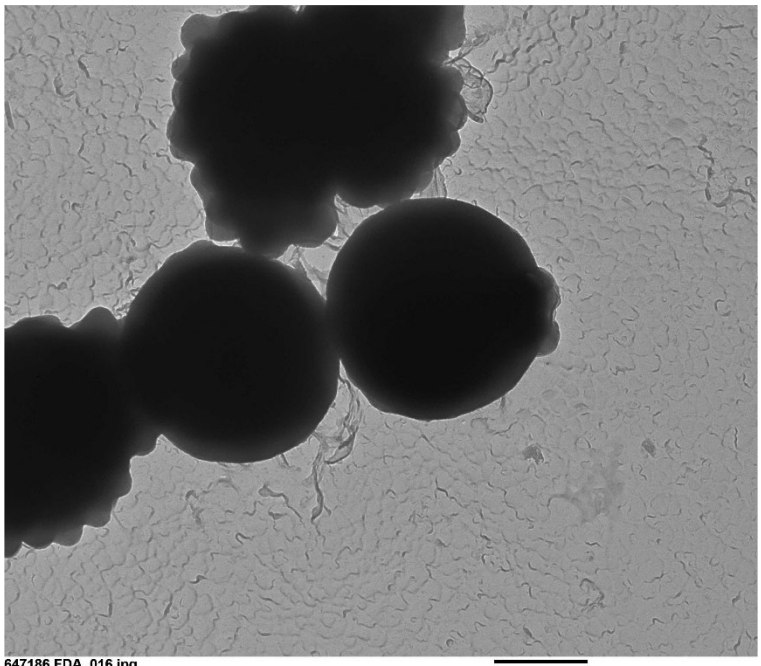
647186 FDA_007.jpg
647186-1
Fe particle
FDA
Cal: 0.000817 µm/pix
12:12 2023-08-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

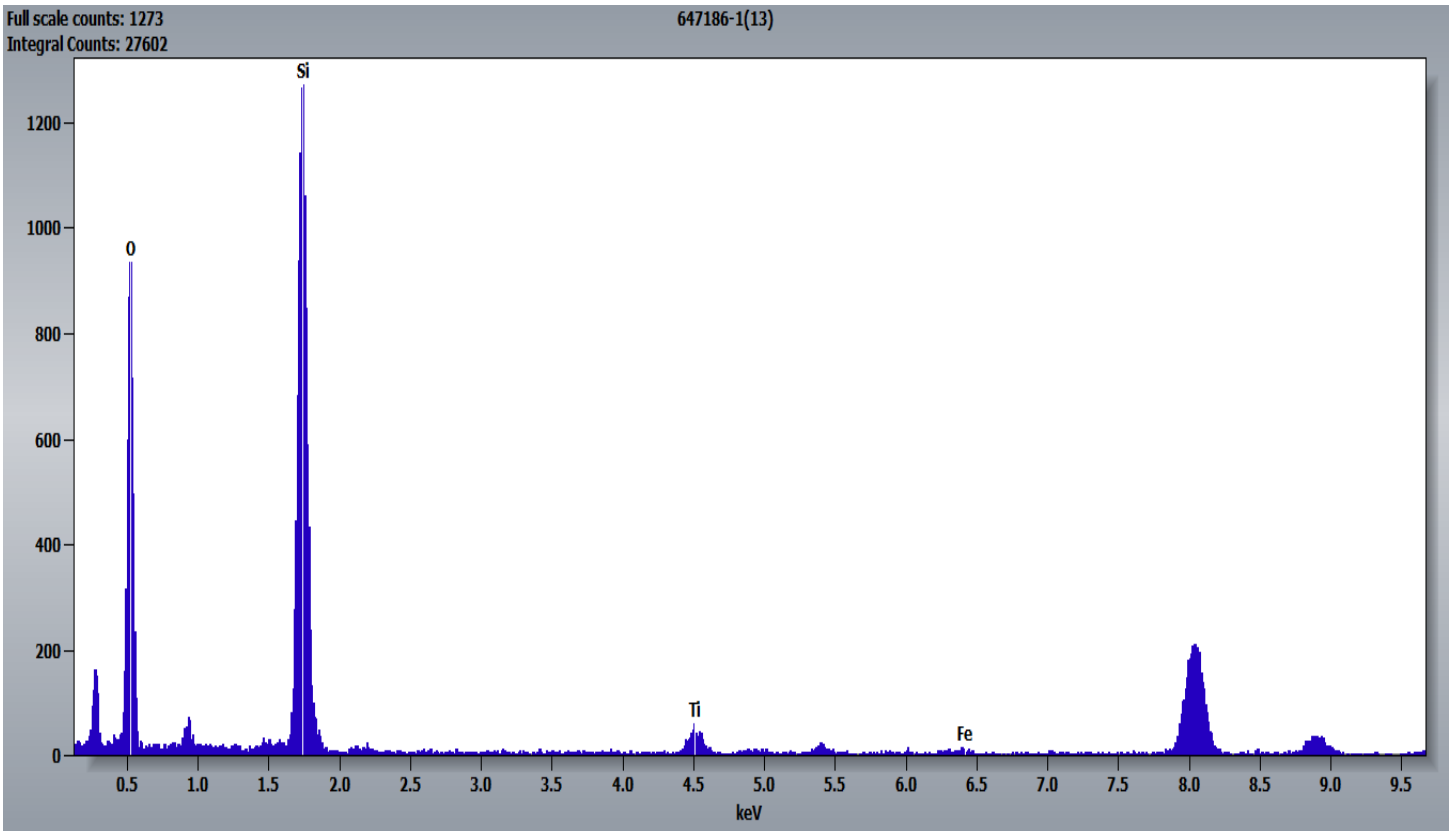
Chemistry from the Iron Particle Pictured Above



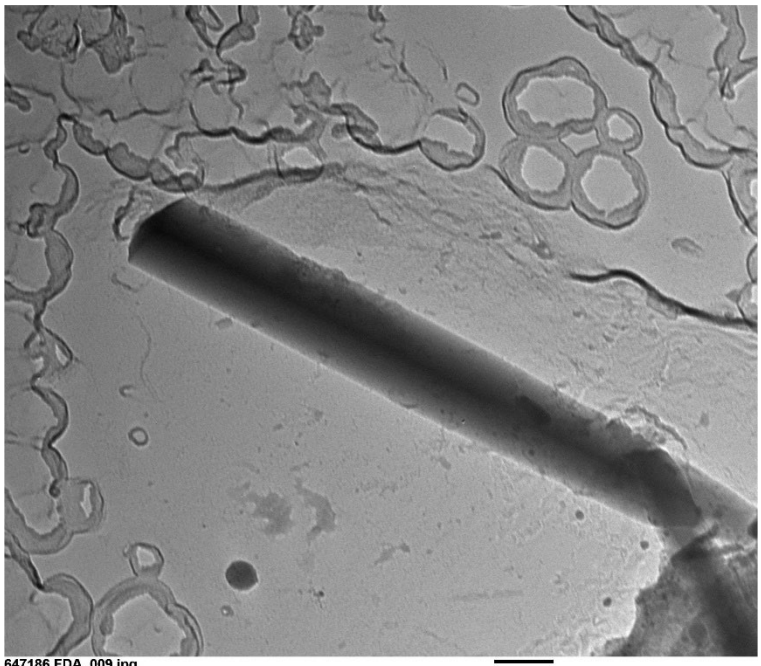
647186-1, Silica Spheres



Chemistry from the Silica Spheres Pictured Above

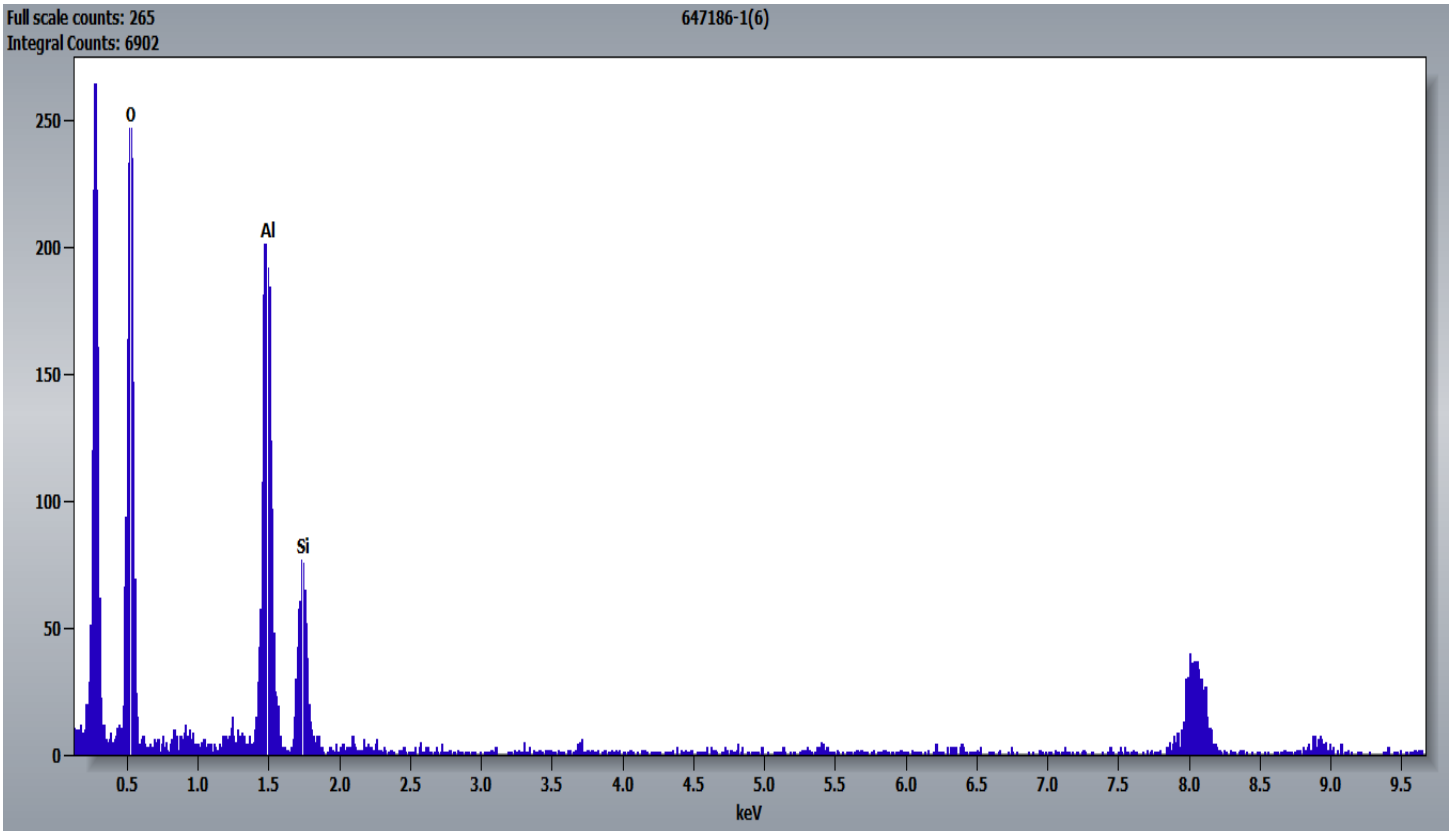


647186-1, Fiber Containing Aluminum and Silicon



Diffraction Pattern from the Fiber Containing Aluminum and Silicon Pictured Above

Chemistry from the Fiber Containing Aluminum and Silicon Pictured Above



647186-2, 2A, 2B/Client Sample: 05162023-2

PLM

All three aliquots of sample 05162023-2 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-2	No Asbestos Detected
647186-2A	No Asbestos Detected
647186-2B	No Asbestos Detected

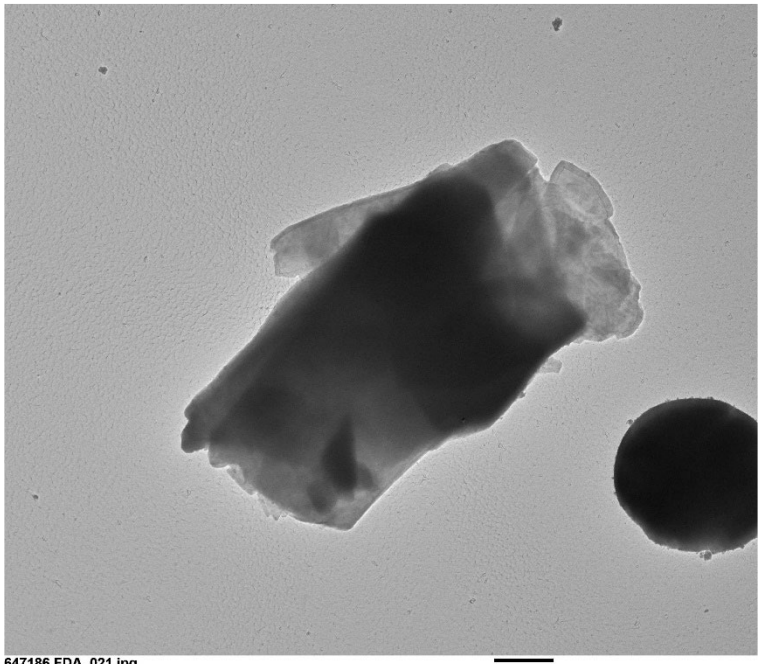
TEM

(b) (6) analyzed aliquot 2 on August 15, 2023. (b) (6) analyzed aliquots 2A and 2B on August 21, 2023. The primary particle observed was talc; silica spheres were also observed along with talc ribbons/fibers and particles containing magnesium, aluminum, and silicon. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

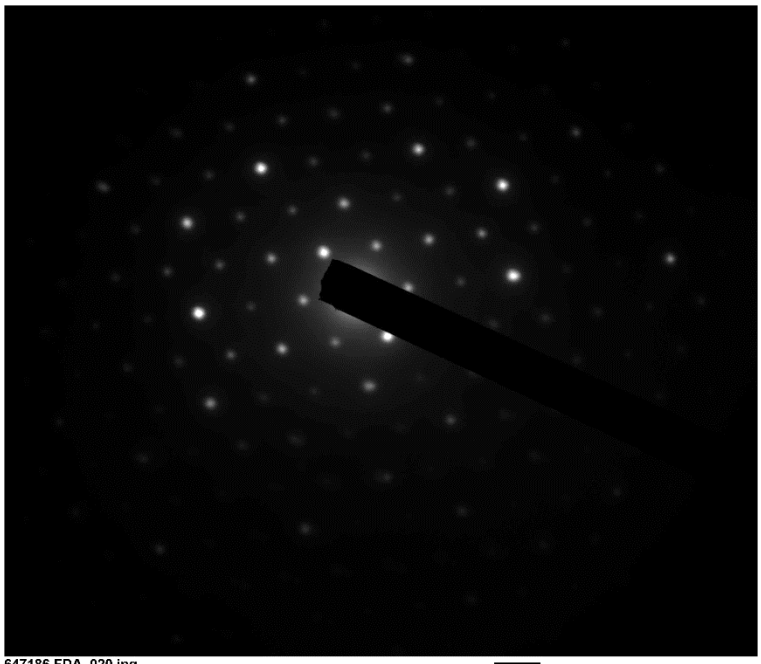
647186-2	No Asbestos Detected
647186-2A	No Asbestos Detected
647186-2B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

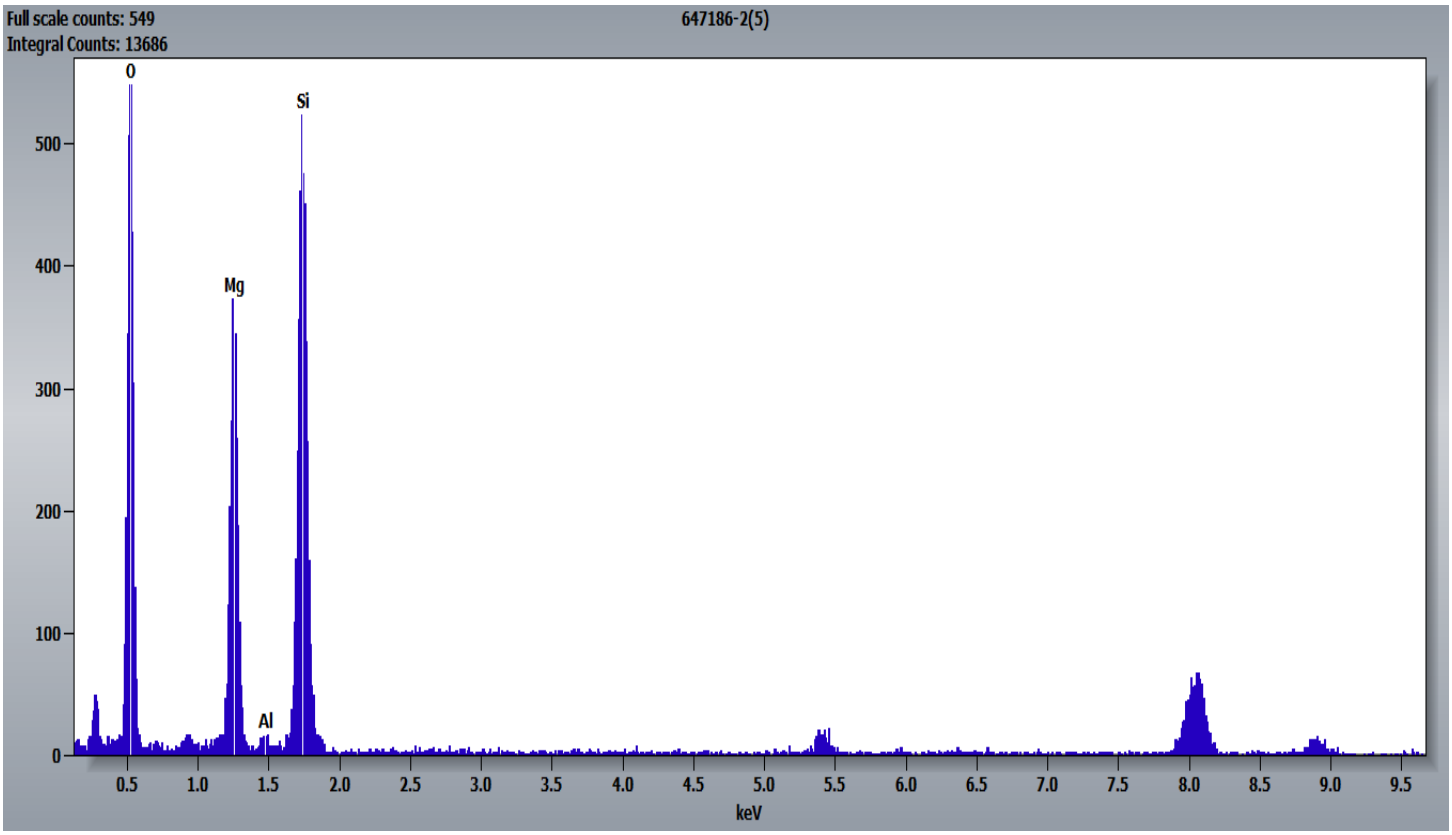
647186-2, Talc Particle



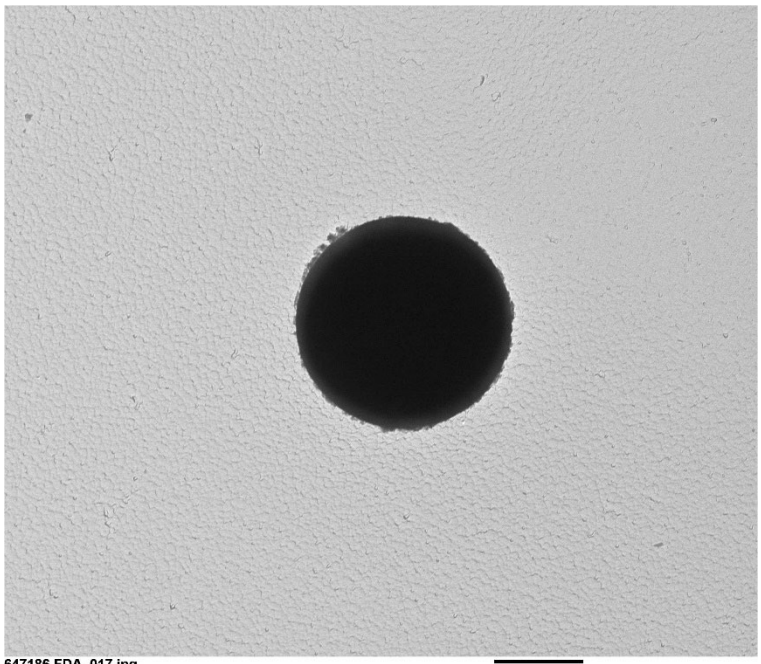
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



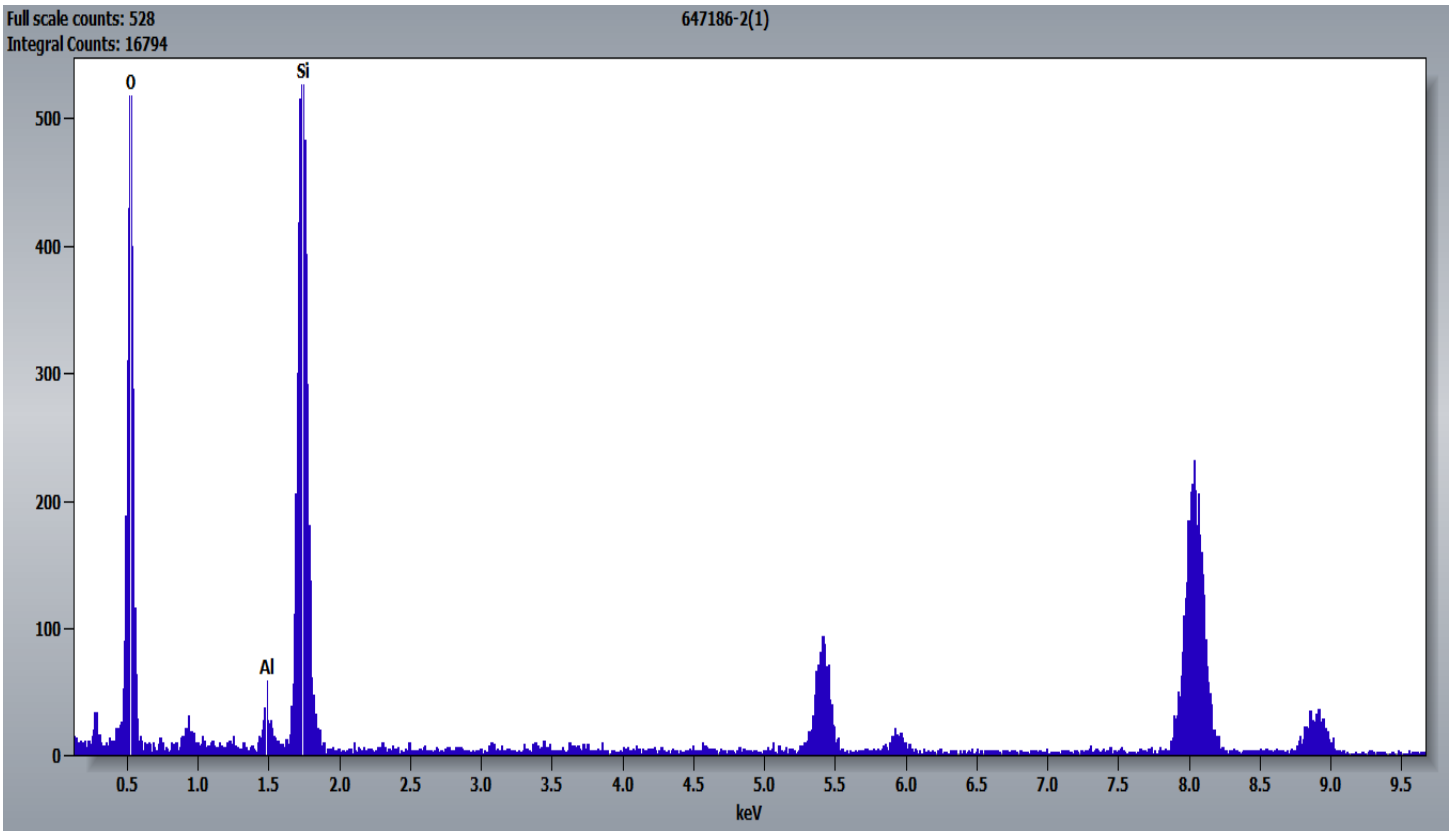
Chemistry from the Talc Particle Pictured Above



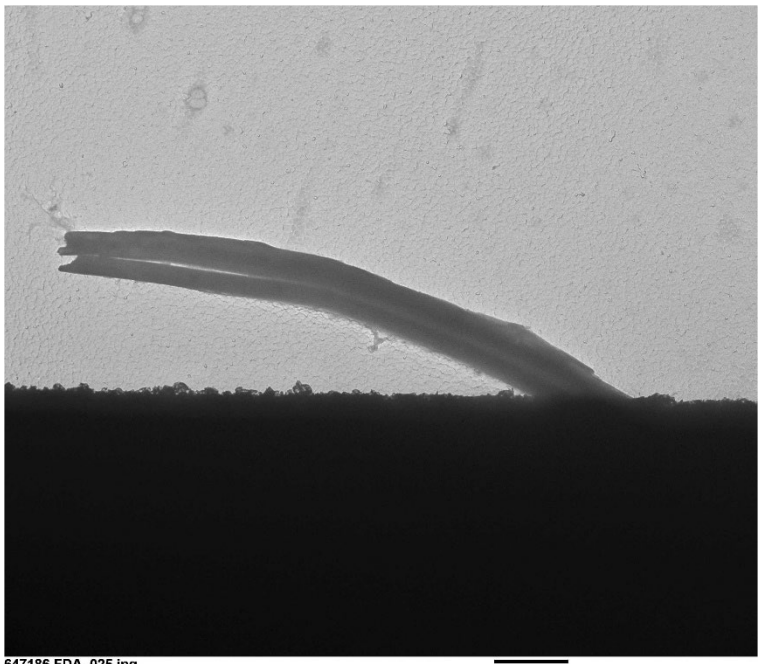
647186-2, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-2, Talc Ribbon

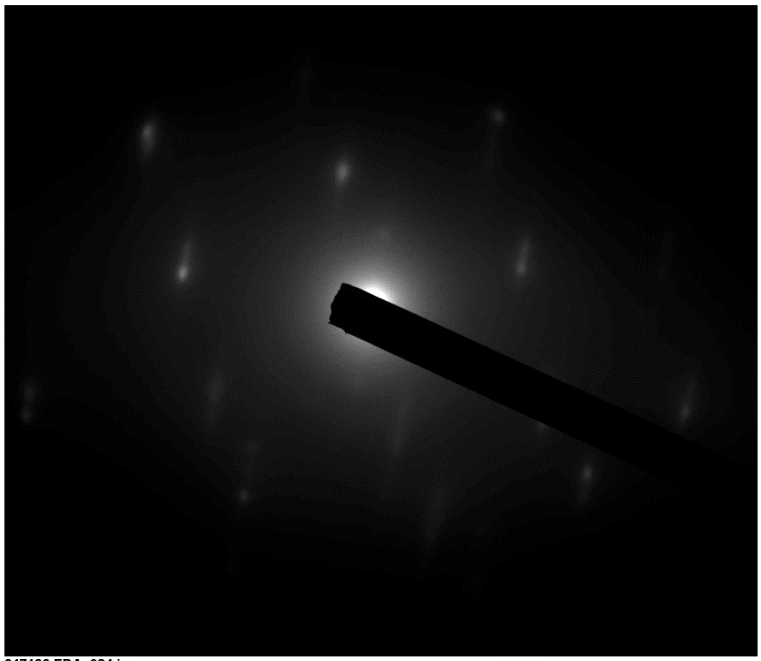


647186 FDA_025.jpg
647186-2
talc ribbon

Cal: 0.003819 µm/pix
15:16 2023-08-15
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

Diffraction Pattern from the Talc Ribbon Pictured Above

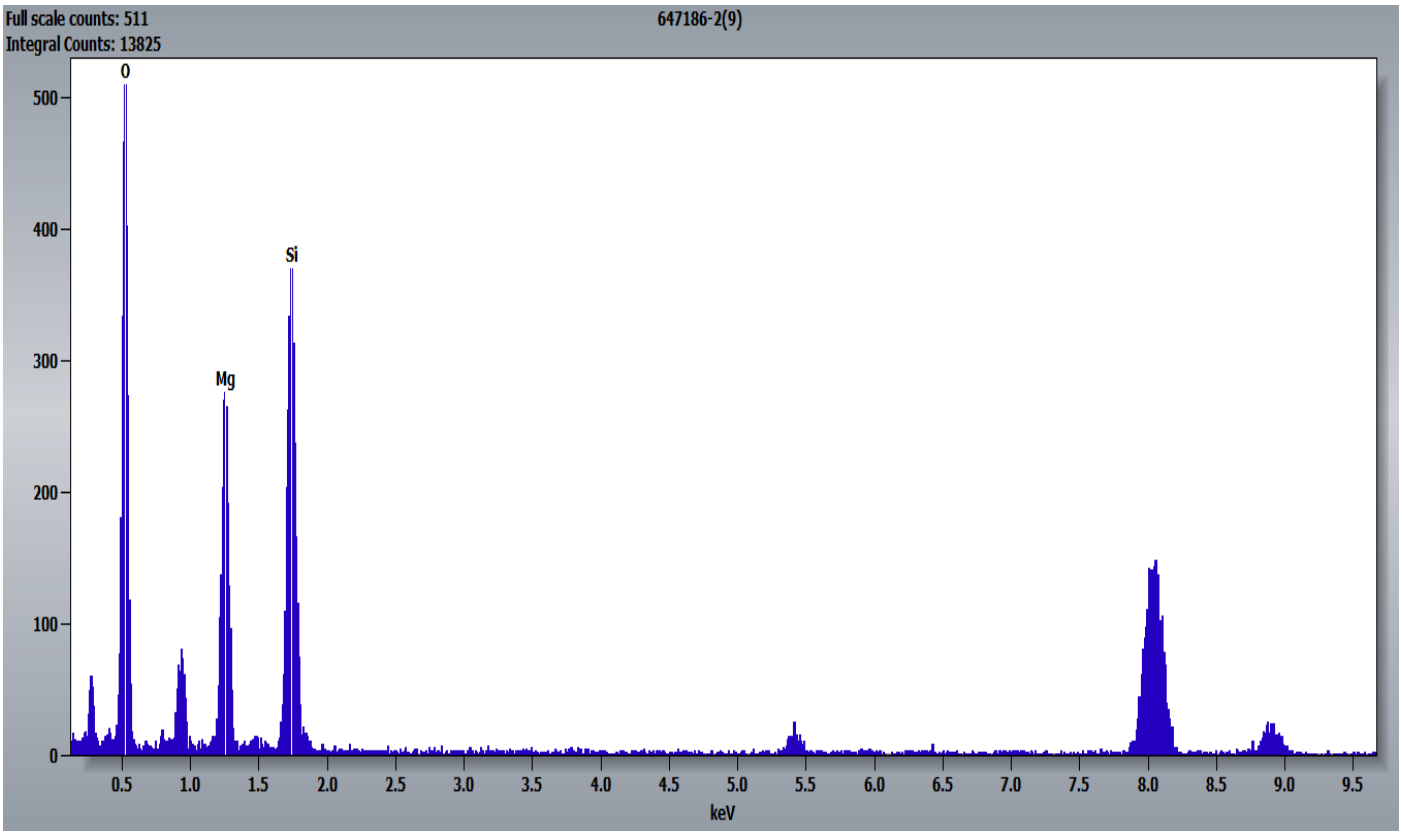


647186 FDA_024.jpg
647186-2
talc ribbon

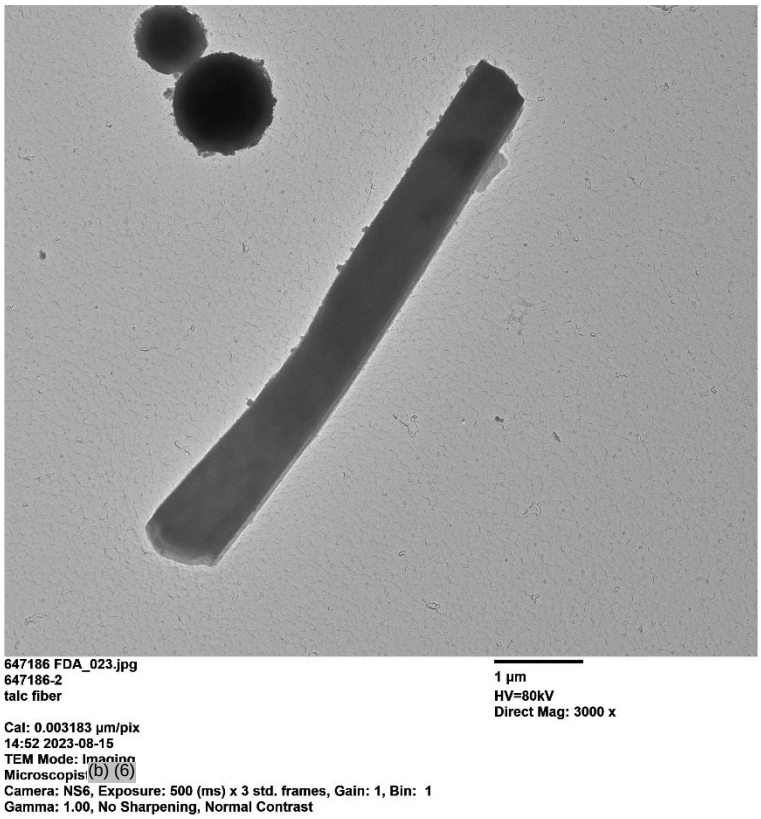
Cal: 0.003183 µm/pix
15:15 2023-08-15
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

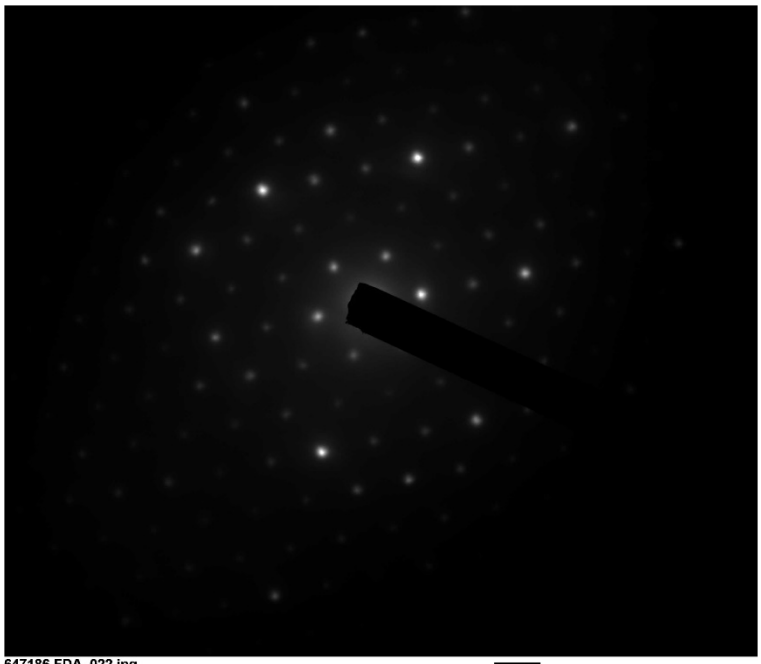
Chemistry from the Talc Ribbon Pictured Above



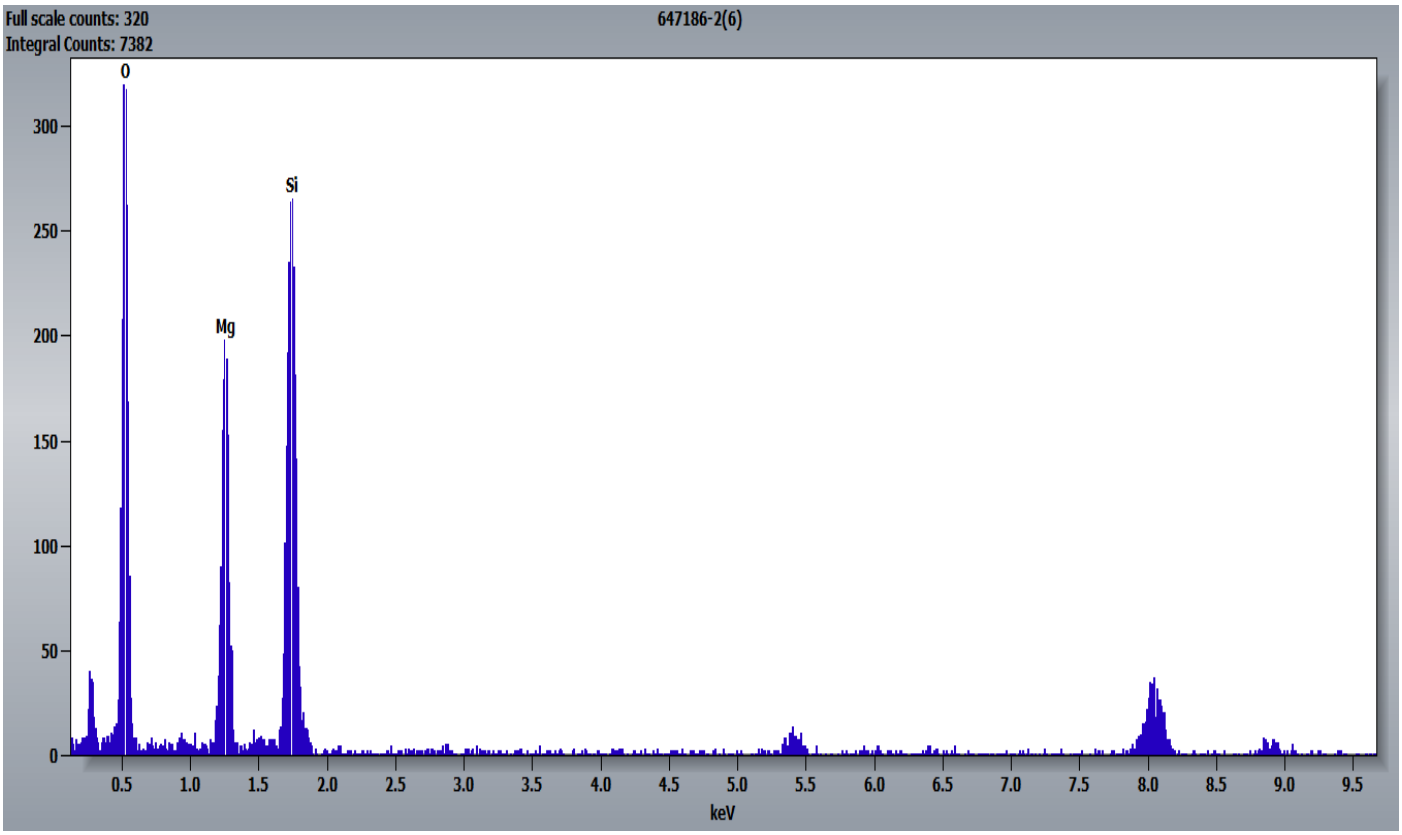
647186-2, Talc Fiber



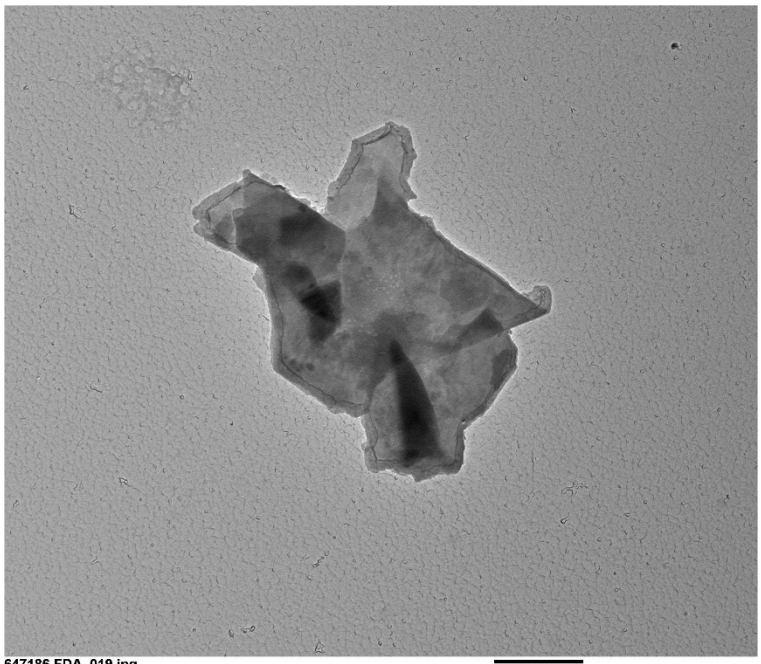
Hexagonal Diffraction Pattern from the Talc Fiber Pictured Above



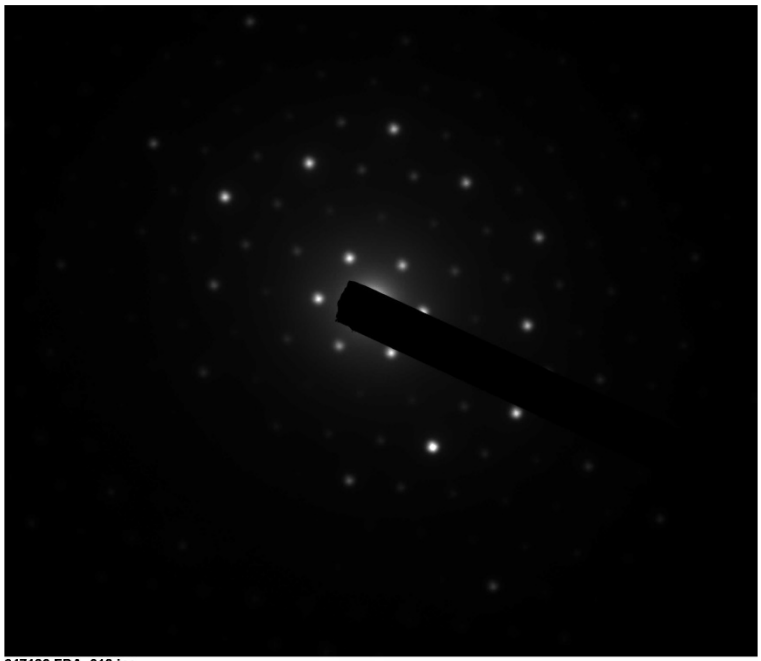
Chemistry from the Talc Fiber Pictured Above



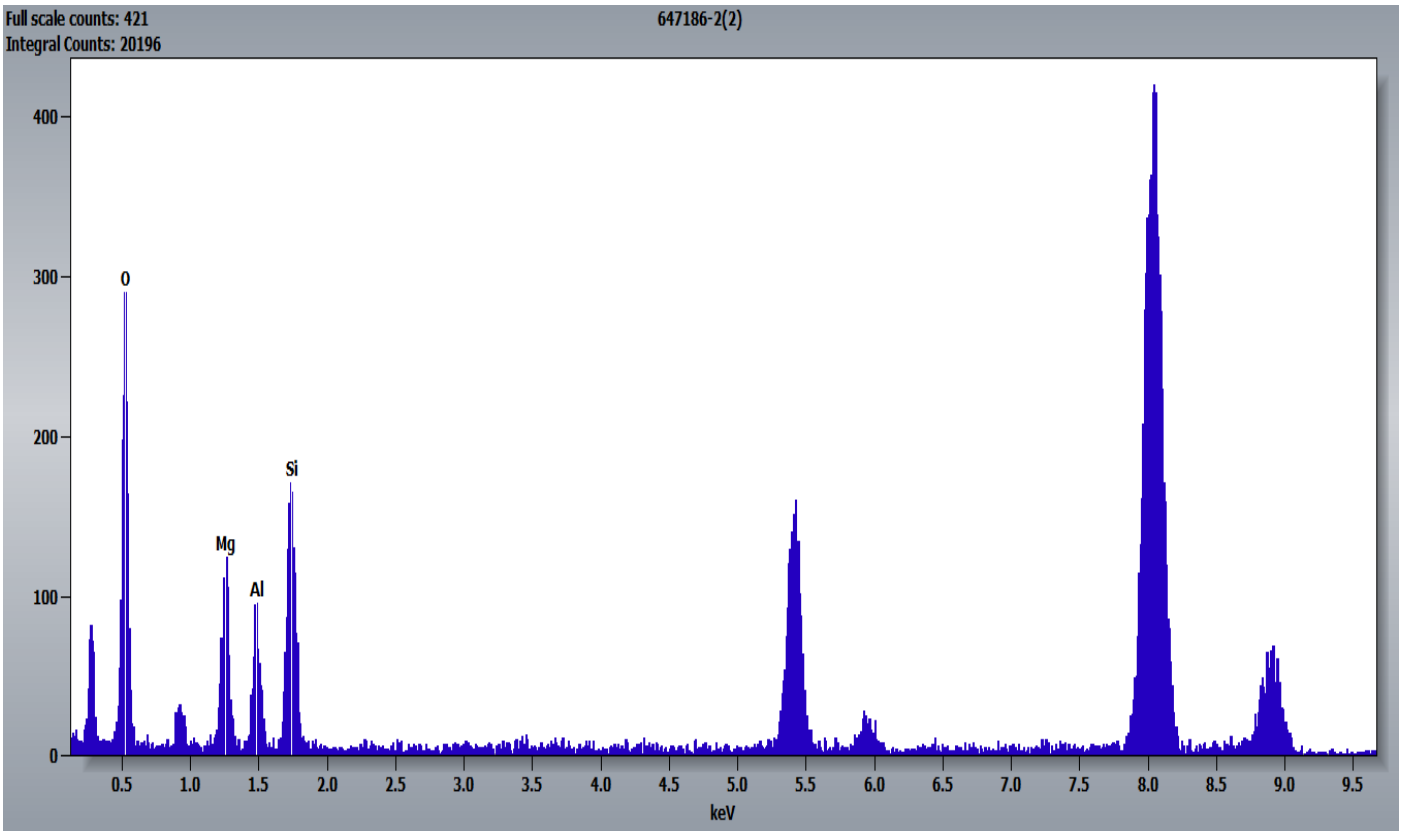
647186-2, Particle Containing Magnesium, Aluminum, and Silicon



Hexagonal Diffraction Pattern from the Particle Containing Magnesium, Aluminum, and Silicon Pictured Above



Chemistry from the Particle Containing Magnesium, Aluminum, and Silicon Pictured Above



647186-3, 3A, 3B/Client Sample: 05162023-3

PLM
All three aliquots of sample 05162023-3 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

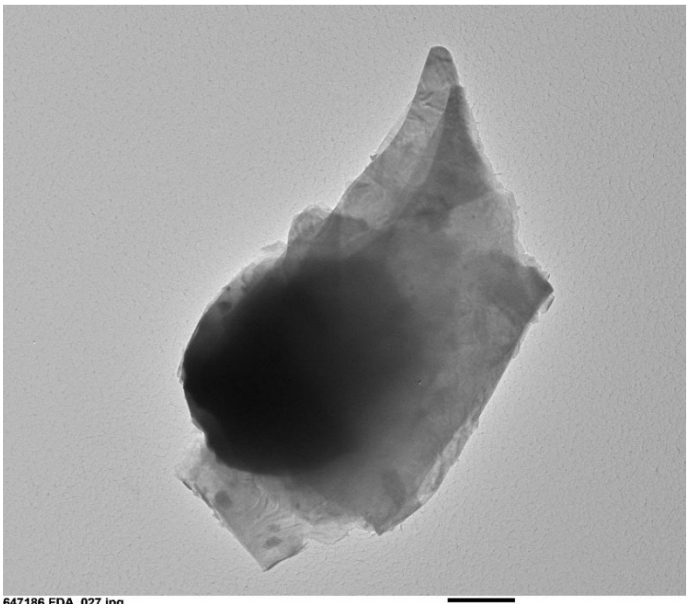
647186-3	No Asbestos Detected
647186-3A	No Asbestos Detected
647186-3B	No Asbestos Detected

TEM
(b) (6) analyzed aliquot 3 on August 16, 2023. (b) (6) analyzed aliquot 3A on August 21, 2023, and aliquot 3B on August 22, 2023. The primary particle observed was mica; titanium and silicon particles were also observed along with particles containing sodium, aluminum, and silicon. No talc and no asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

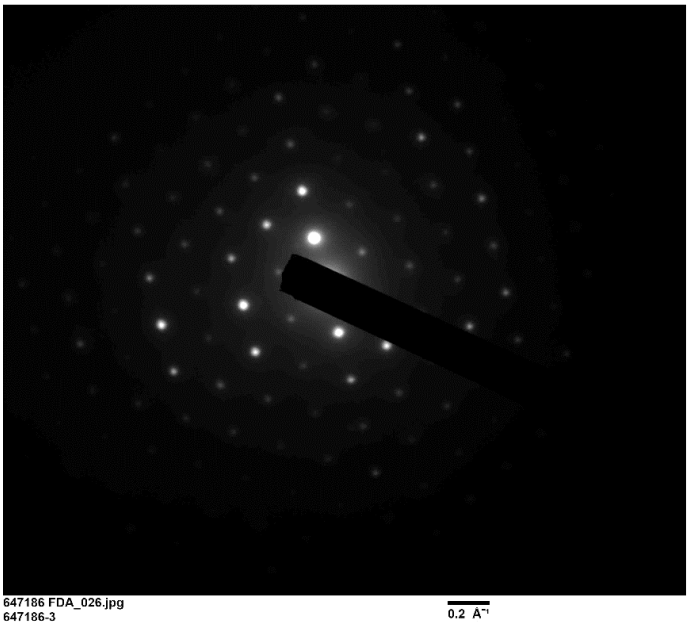
647186-3	No Asbestos Detected
647186-3A	No Asbestos Detected
647186-3B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

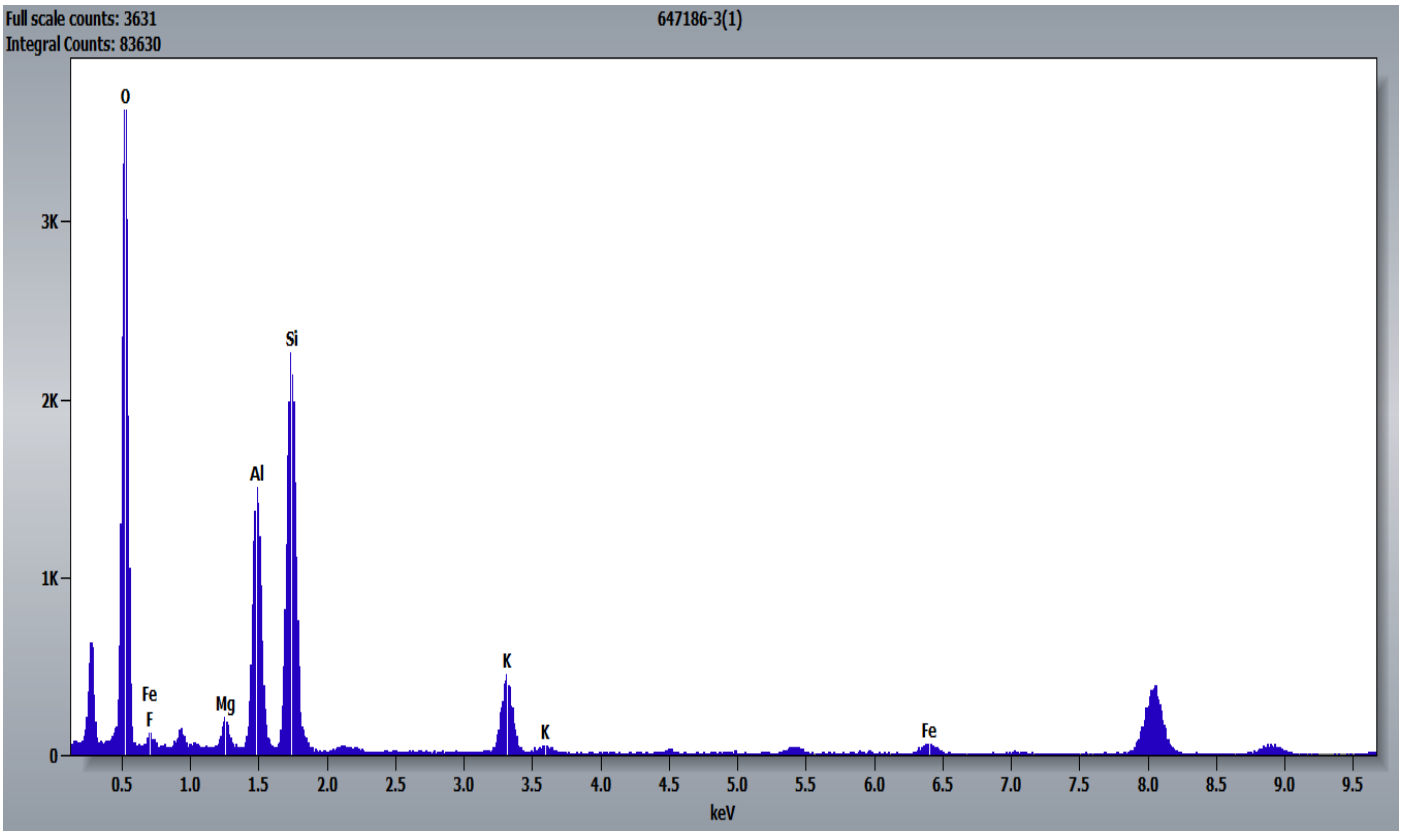
647186-3, Mica Particle



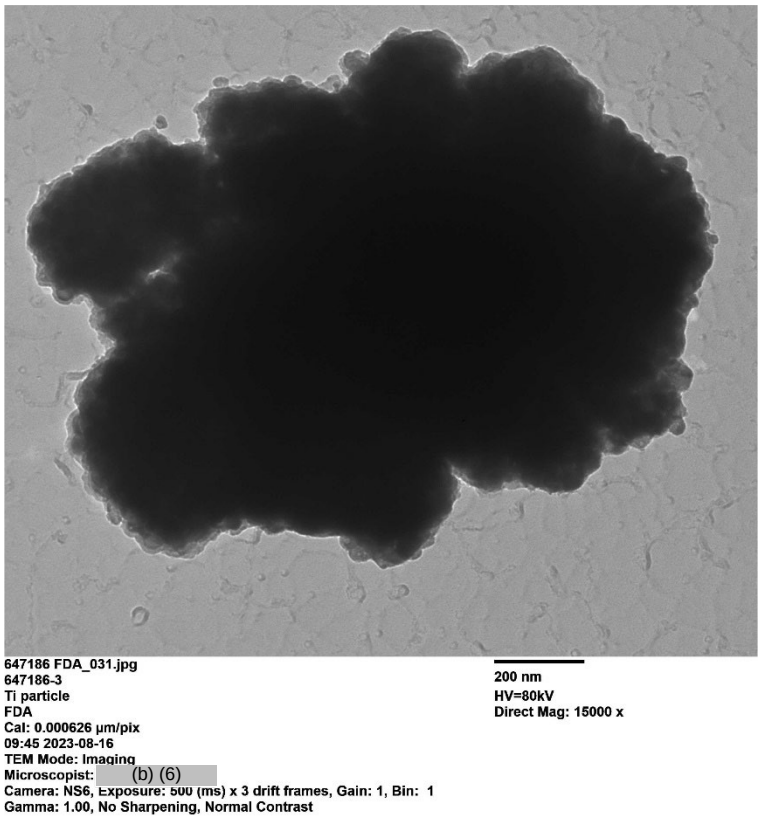
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above



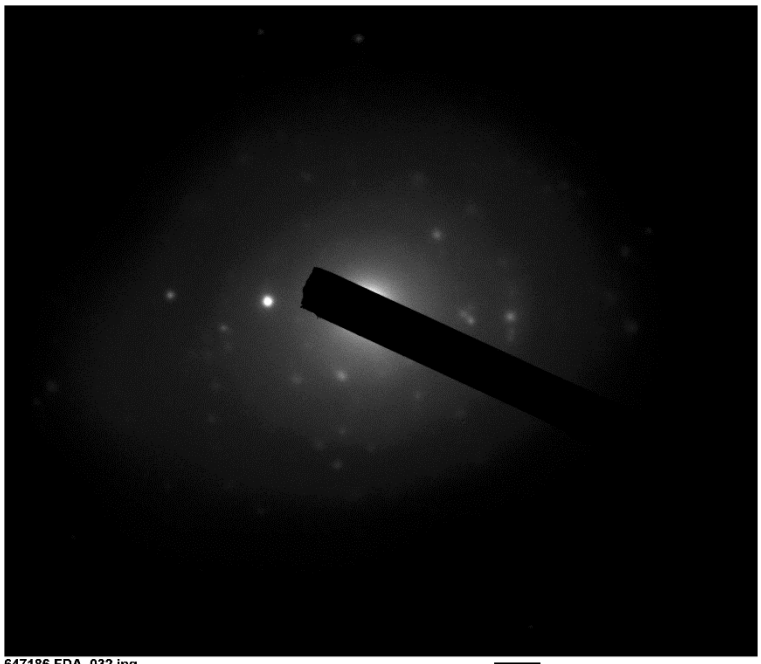
Chemistry from the Mica Particle Pictured Above



647186-3, Titanium Particle



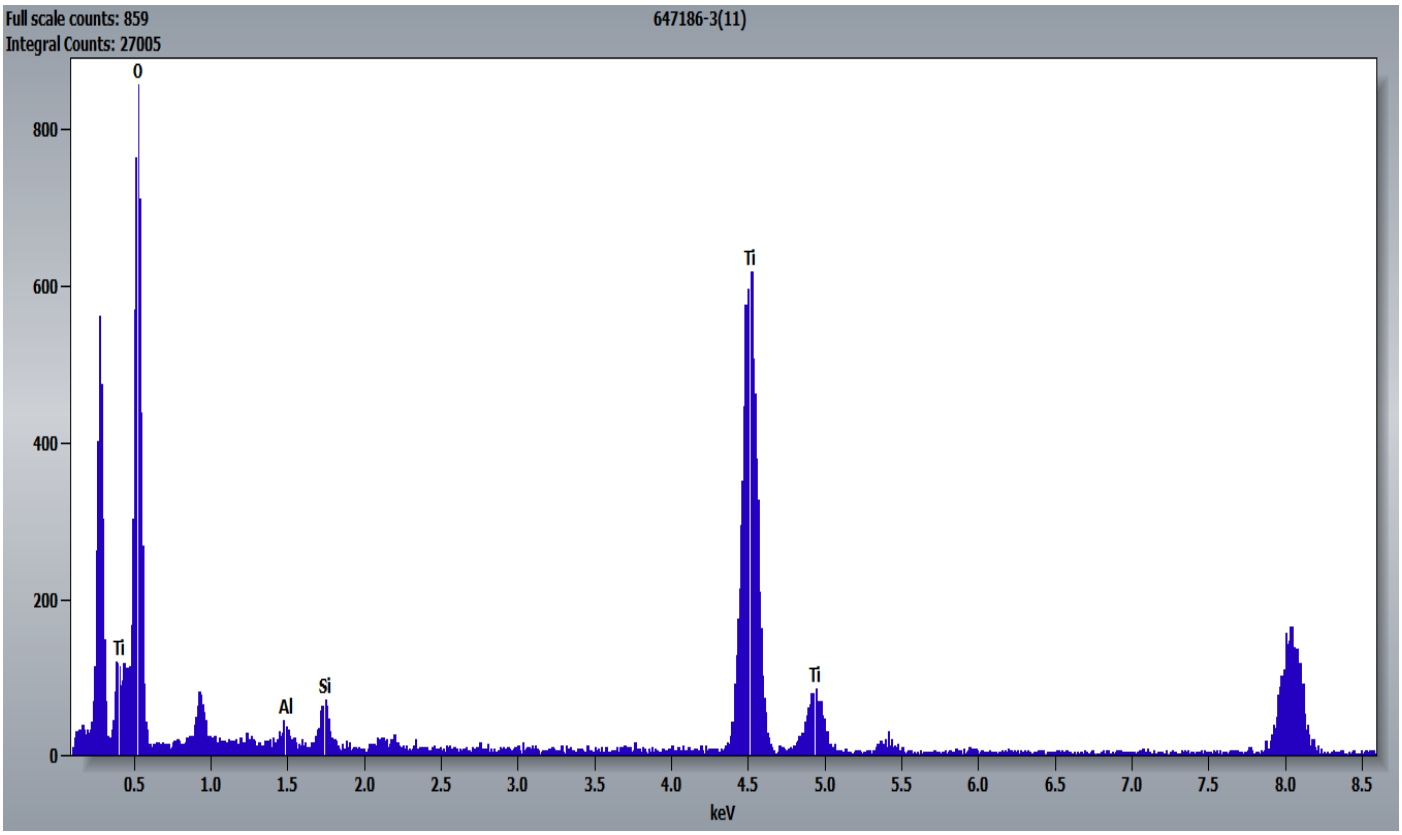
Diffraction Pattern from the Titanium Particle Pictured Above



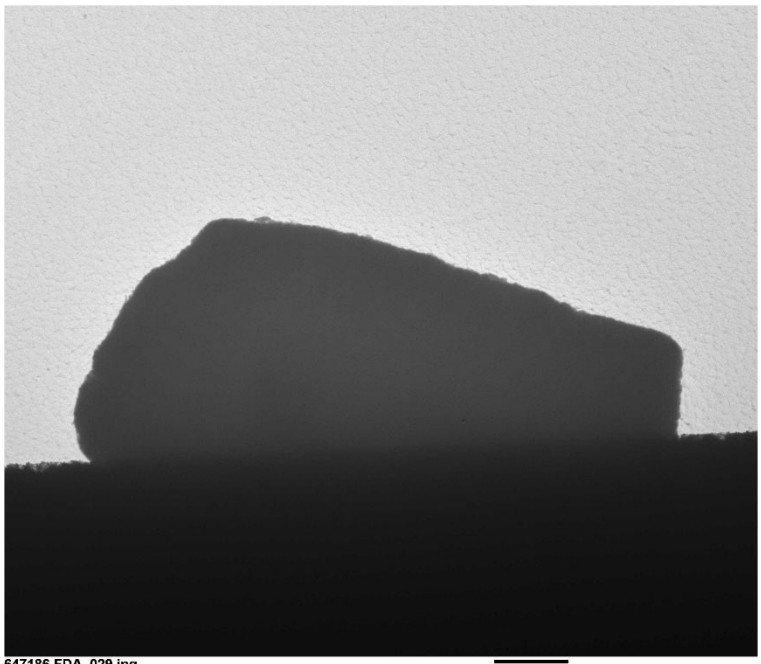
647186 FDA_032.jpg
647186-3
Ti particle
FDA
Cal: 0.000626 µm/pix
09:46 2023-08-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 A⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Titanium Particle Pictured Above



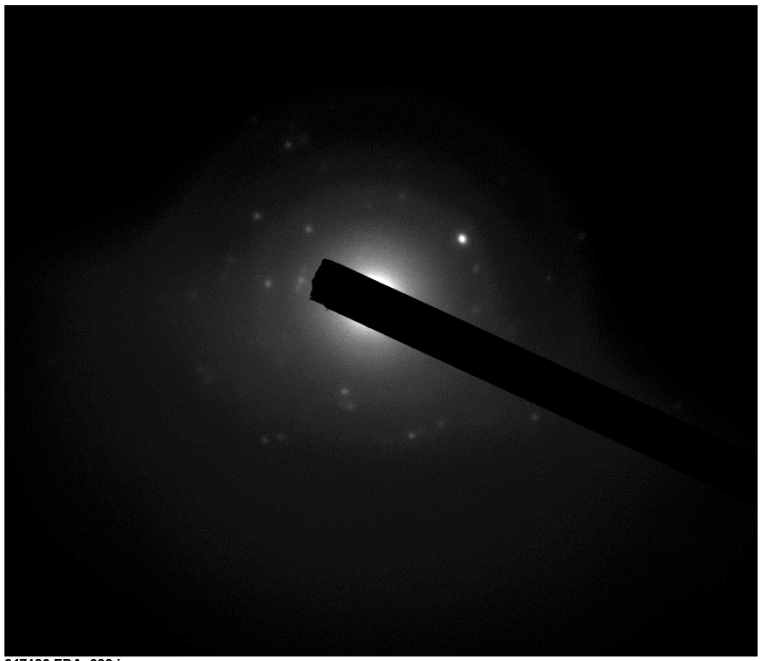
647186-3, Mica Particle with Titanium



647186 FDA_029.jpg
647186-3
Ti, mica mix
FDA
Cal: 0.003819 µm/pix
09:25 2023-08-16
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

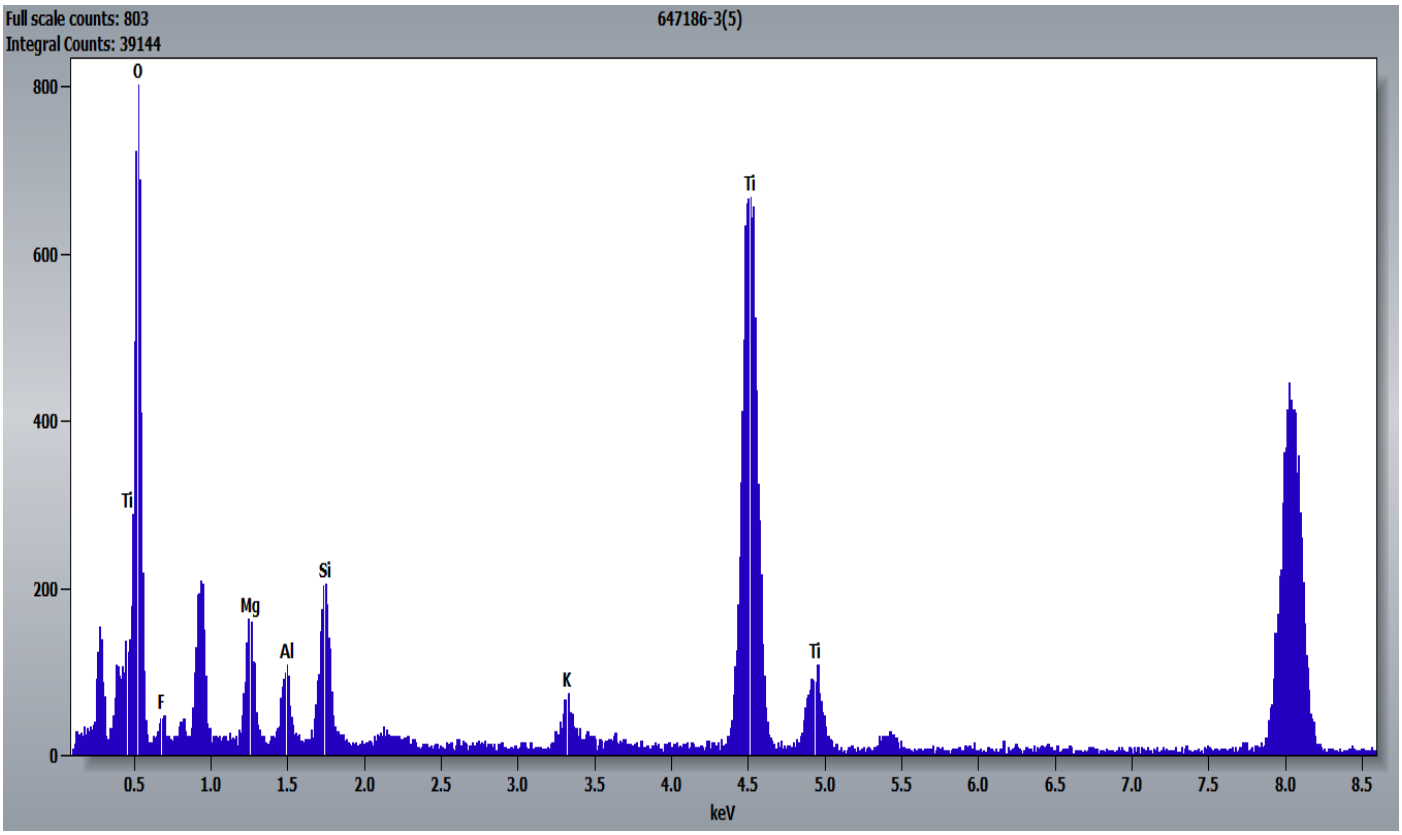
Diffraction Pattern from the Mica Particle with Titanium Pictured Above



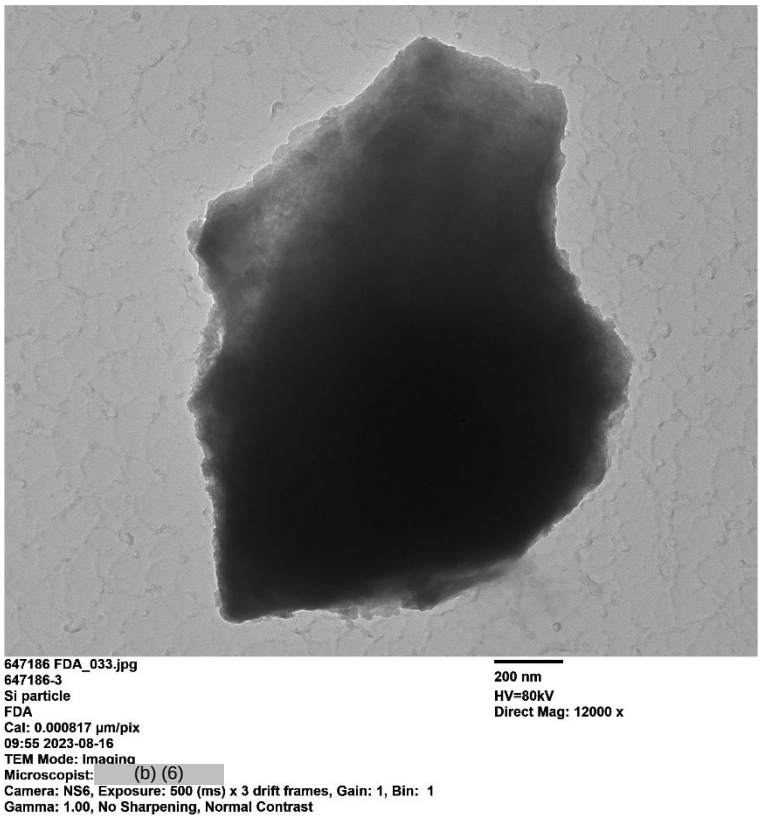
647186 FDA_030.jpg
647186-3
Ti, mica mix
FDA
Cal: 0.003819 µm/pix
09:27 2023-08-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

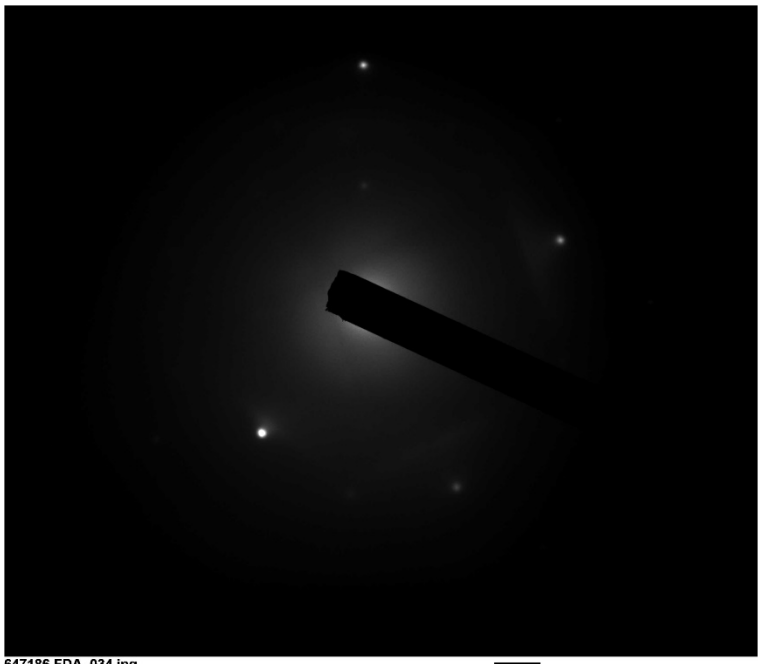
Chemistry from the Mica Particle with Titanium Pictured Above



647186-3, Silicon Particle



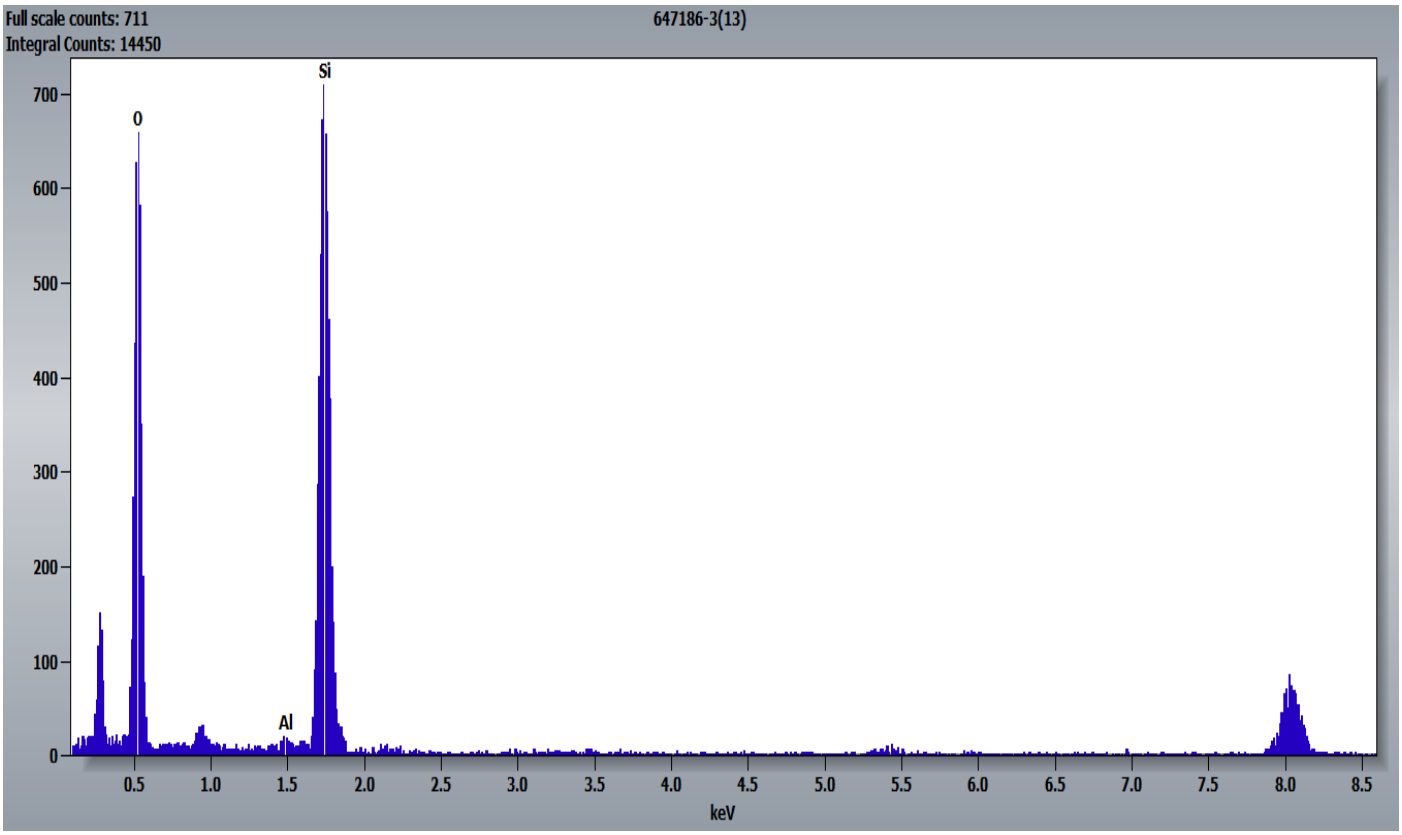
Diffraction Pattern from the Silicon Particle Pictured Above



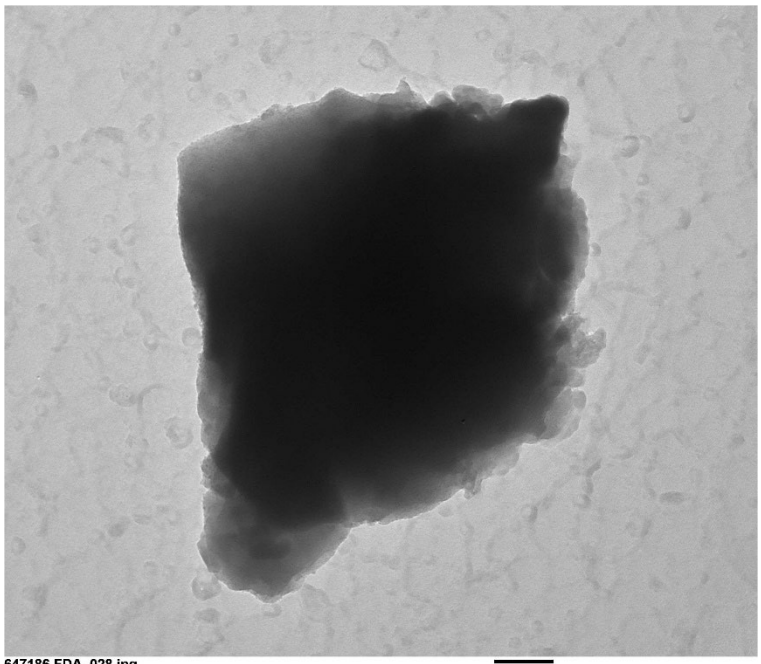
647186 FDA_034.jpg
647186-3
Si particle
FDA
Cal: 0.000817 µm/pix
09:57 2023-08-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

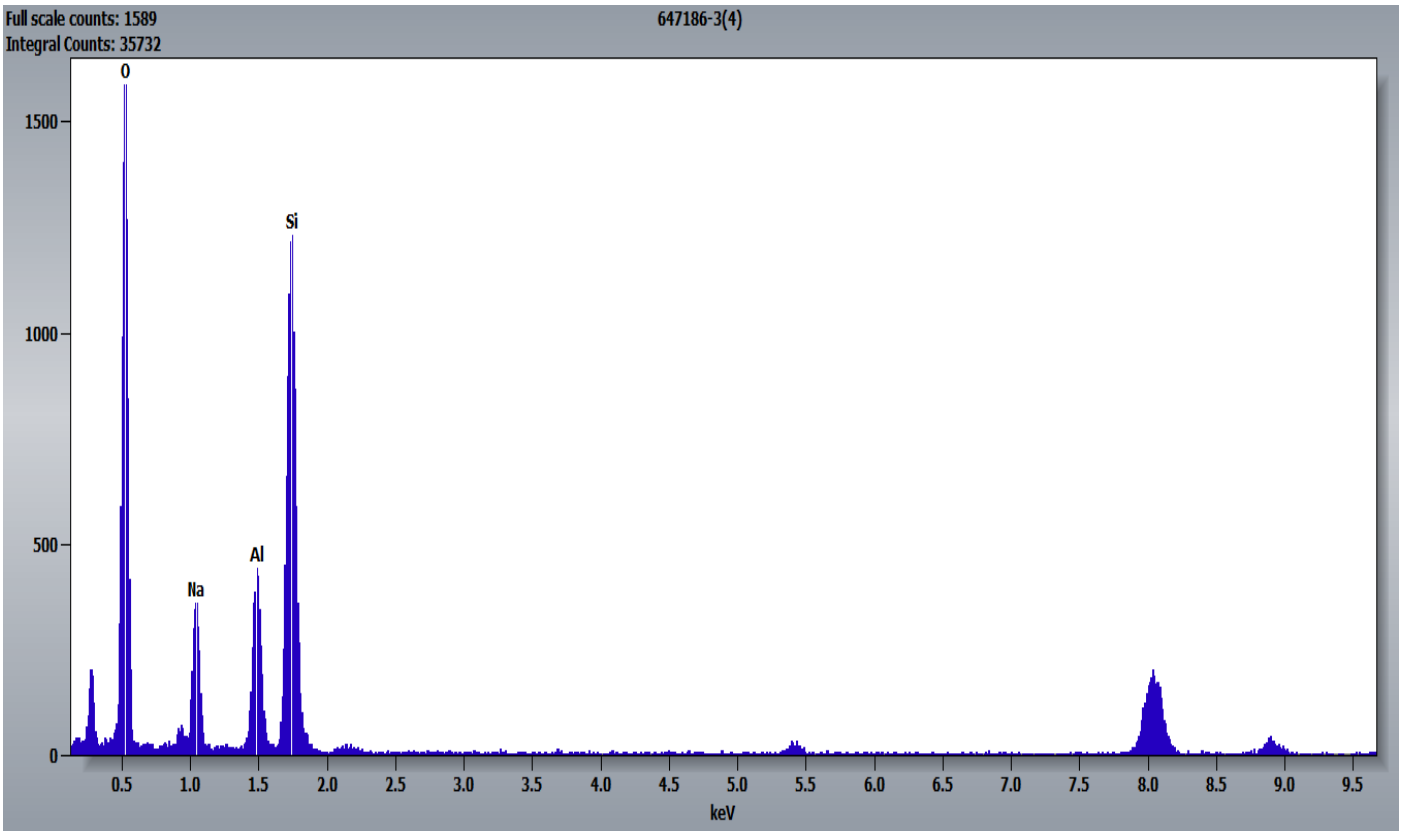
Chemistry from the Silicon Particle Pictured Above



647186-3, Particle Containing Sodium, Aluminum, and Silicon



Chemistry from the Particle Containing Sodium, Aluminum, and Silicon Pictured Above



647186-4, 4A, 4B/Client Sample: 05162023-4

PLM

All three aliquots of sample 05162023-4 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-4	No Asbestos Detected
647186-4A	No Asbestos Detected
647186-4B	No Asbestos Detected

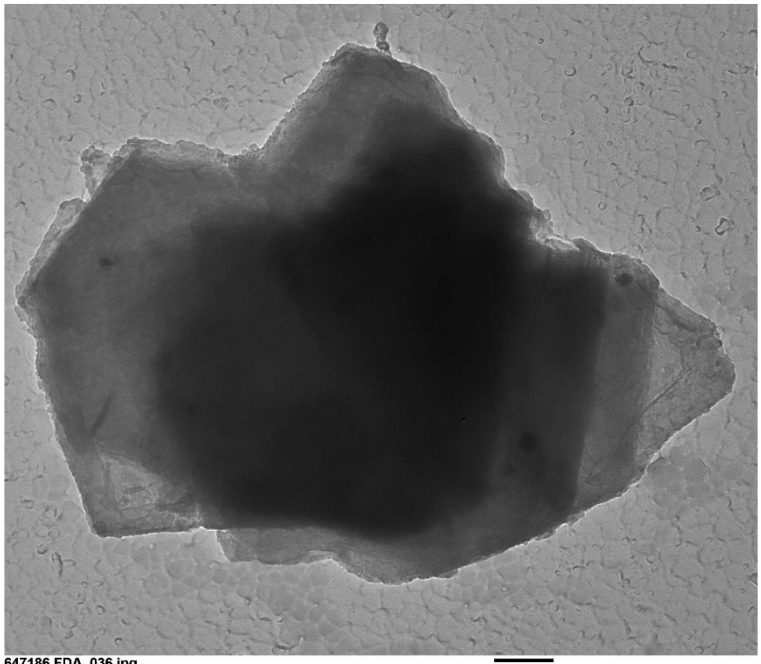
TEM

(b) (6) analyzed aliquot 4 on August 16, 2023. (b) (6) analyzed aliquot 4A on August 22, 2023, and aliquot 4B on August 22, 2023 through August 23, 2023. The primary particles observed were talc and iron; talc ribbons/fibers were also observed. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

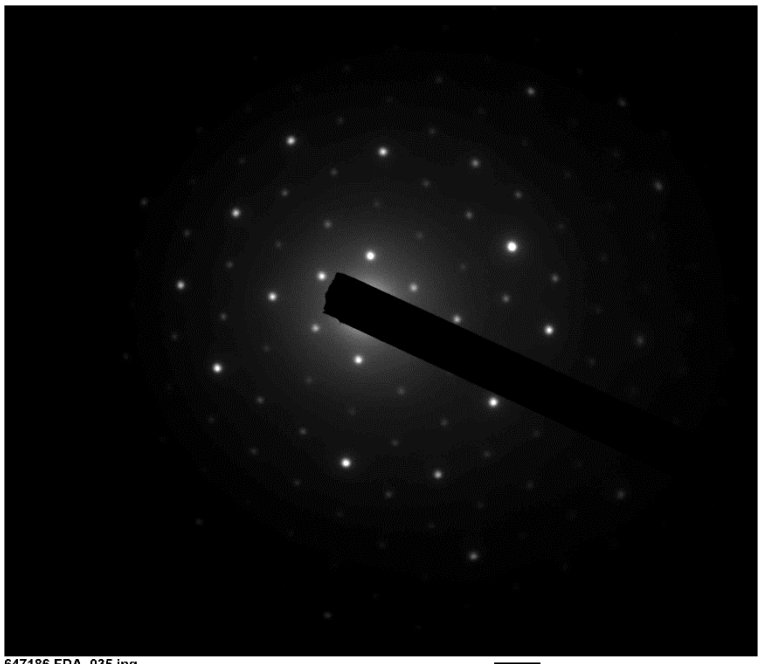
647186-4	No Asbestos Detected
647186-4A	No Asbestos Detected
647186-4B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-4, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

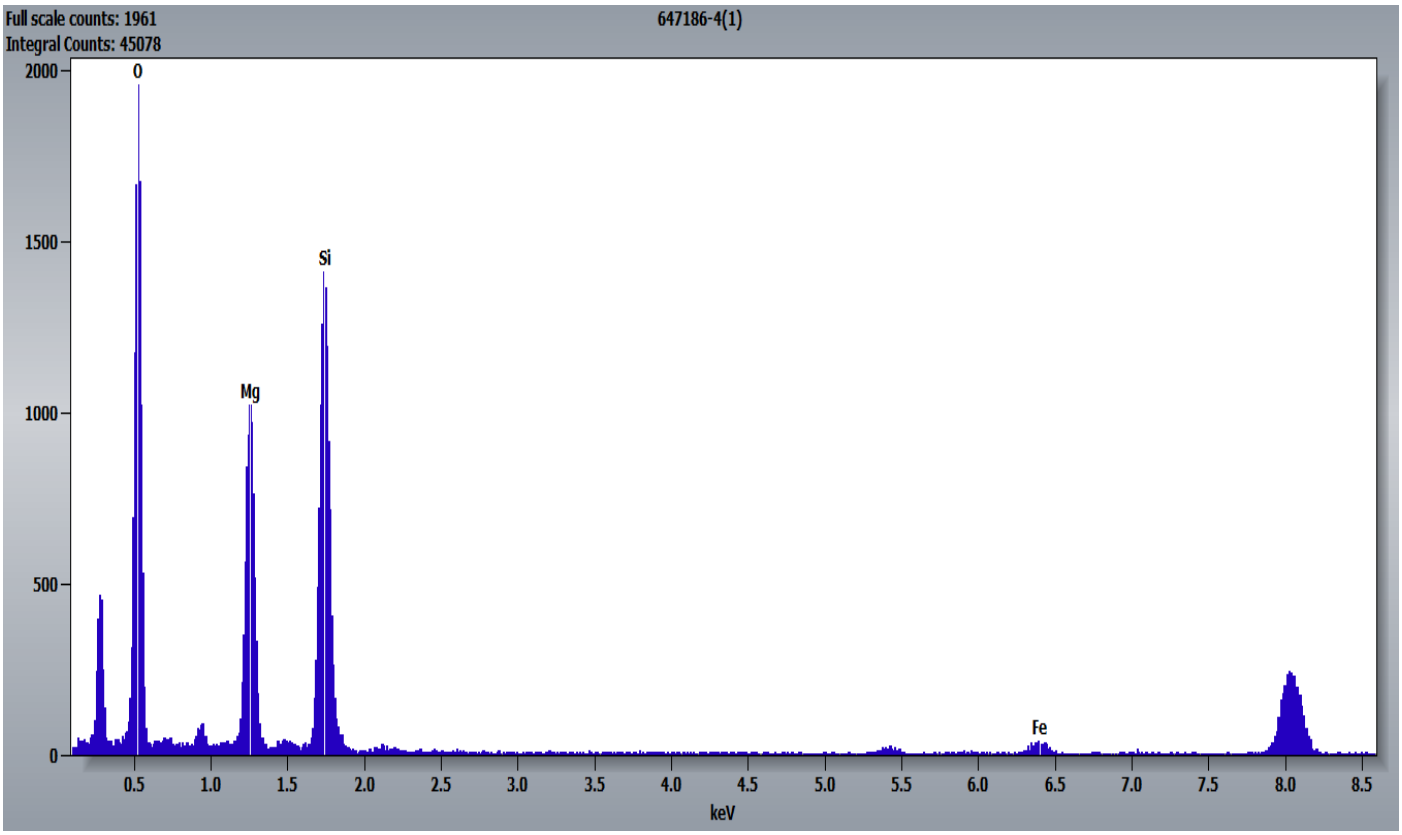


647186 FDA_035.jpg
647186-4
Talc
FDA

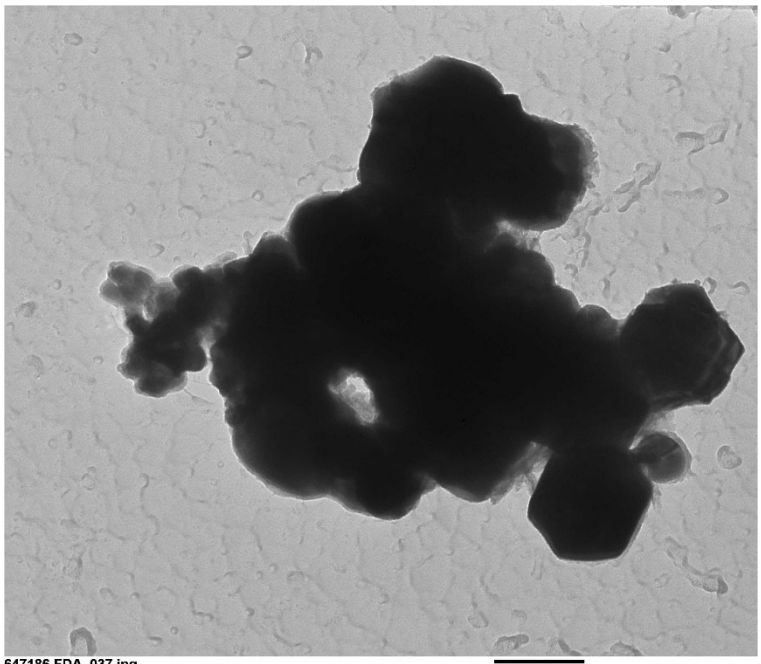
14:22 2023-08-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle Pictured Above



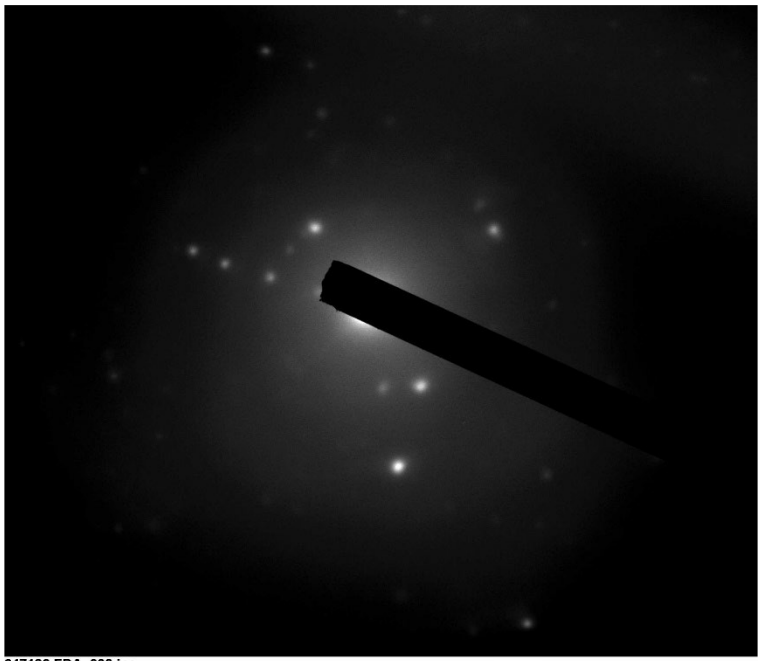
647186-4, Iron Particle



647186 FDA_037.jpg
647186-4
Fe particles
FDA
Cal: 0.000626 µm/pix
14:27 2023-08-16
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 15000 x

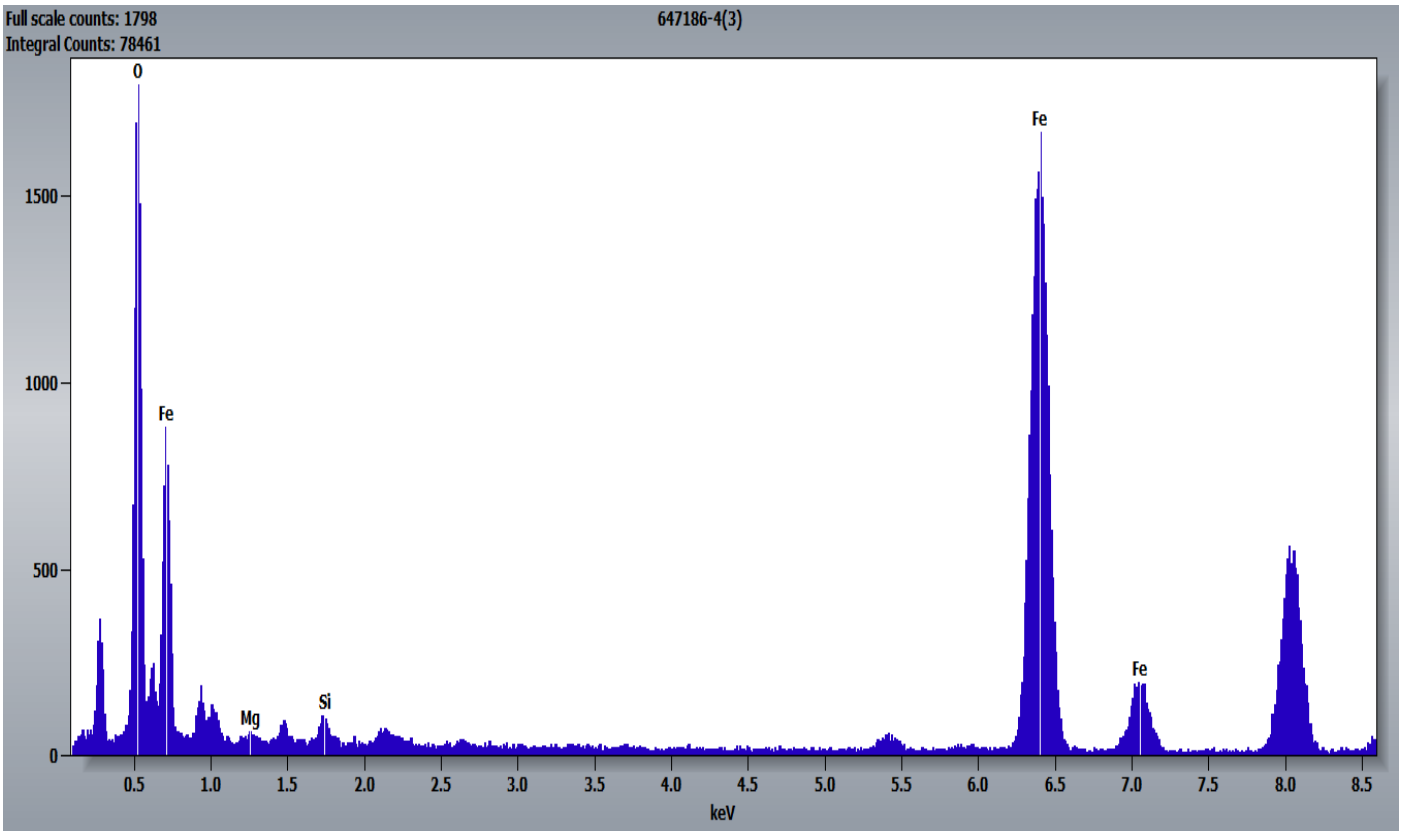
Diffraction Pattern from the Iron Particles Pictured Above



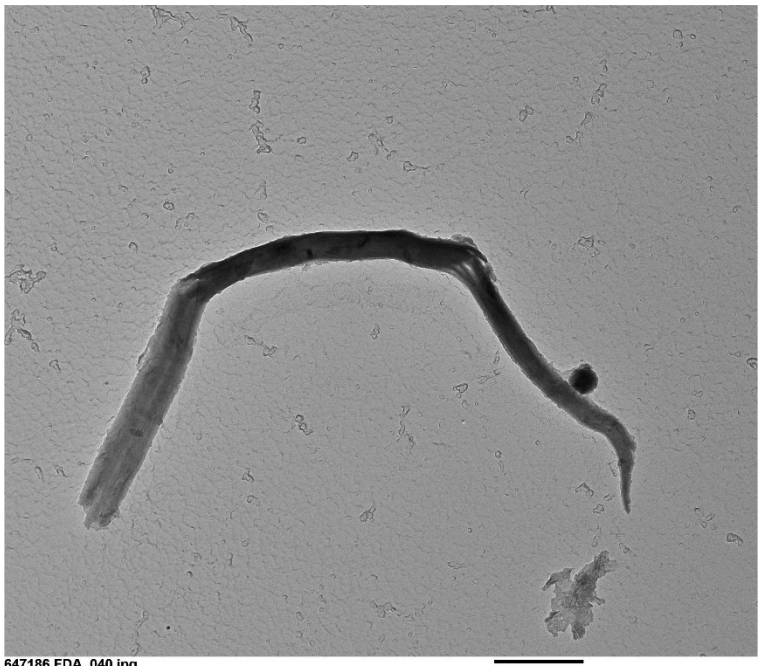
647186 FDA_038.jpg
647186-4
Fe particles
FDA
Cal: 0.000626 µm/pix
14:29 2023-08-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Iron Particles Pictured Above



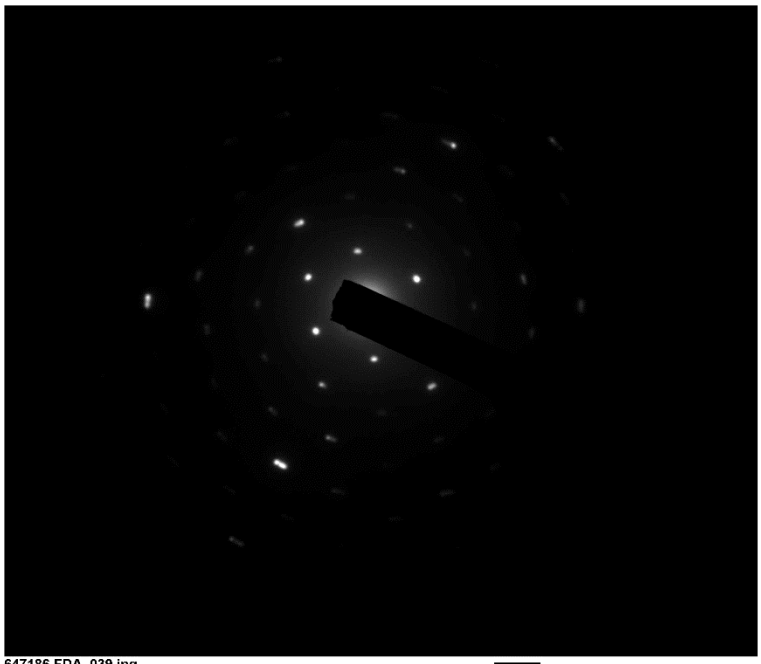
647186-4, Talc Ribbon



647186 FDA_040.jpg
647186-4
Talc ribbon
FDA
Cal: 0.001905 µm/pix
14:34 2023-08-16
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 5000 x

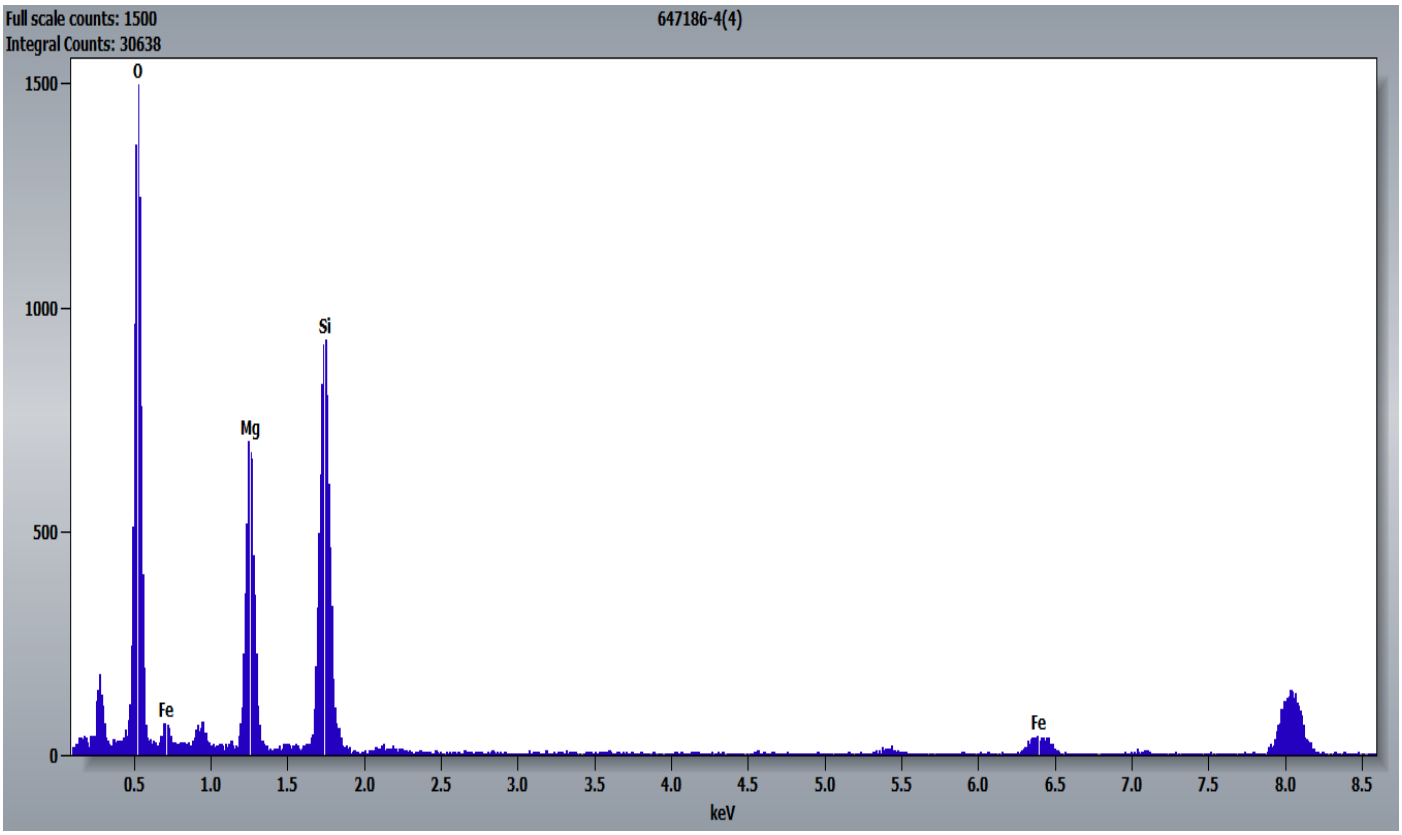
Diffraction Pattern from the Talc Ribbon Pictured Above



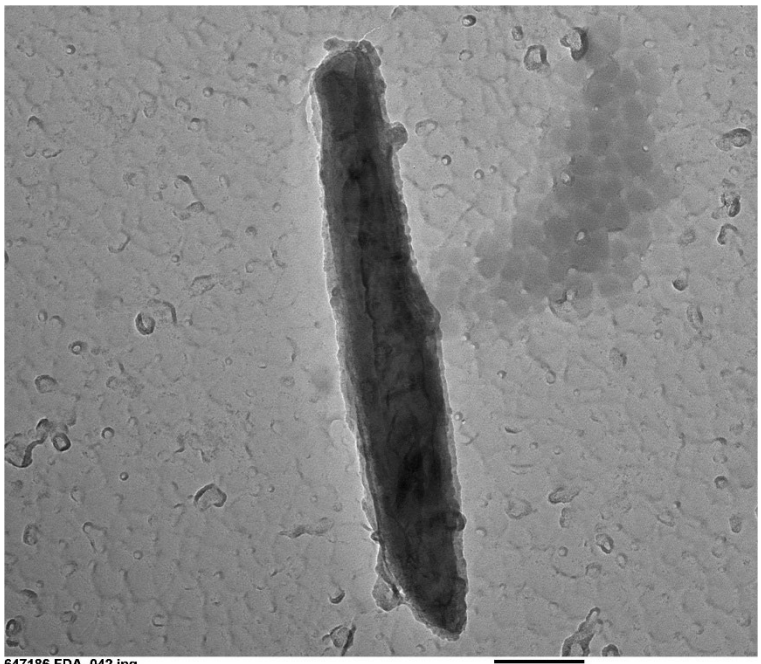
647186 FDA_039.jpg
647186-4
Talc ribbon
FDA
Cal: 0.000626 µm/pix
14:33 2023-08-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



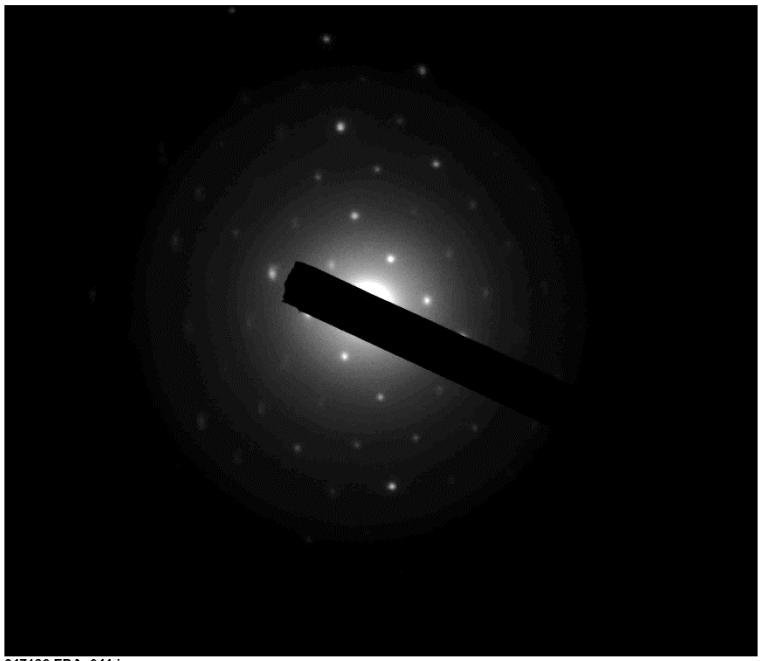
647186-4, Talc Fiber



647186 FDA_042.jpg
647186-4
Talc fiber
FDA
Cal: 0.000626 µm/pix
14:54 2023-08-16
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 15000 x

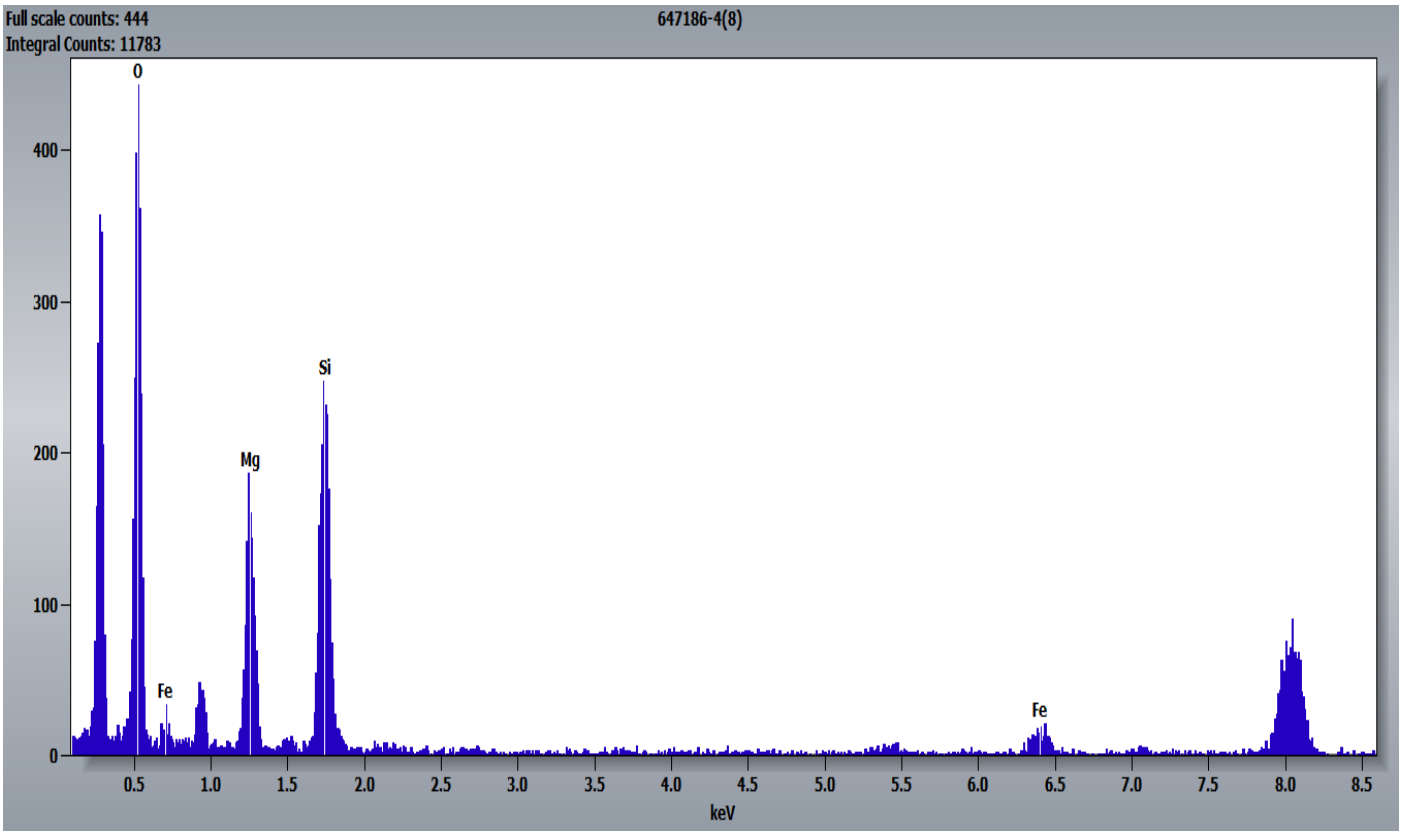
Diffraction Pattern from the Talc Fiber Pictured Above



647186 FDA_041.jpg
647186-4
Talc fiber
FDA
Cal: 0.001905 µm/pix
14:53 2023-08-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Fiber Pictured Above



647186-5, 5A, 5B/Client Sample: 05162023-5

PLM

All three aliquots of sample 05162023-5 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-5	No Asbestos Detected
647186-5A	No Asbestos Detected
647186-5B	No Asbestos Detected

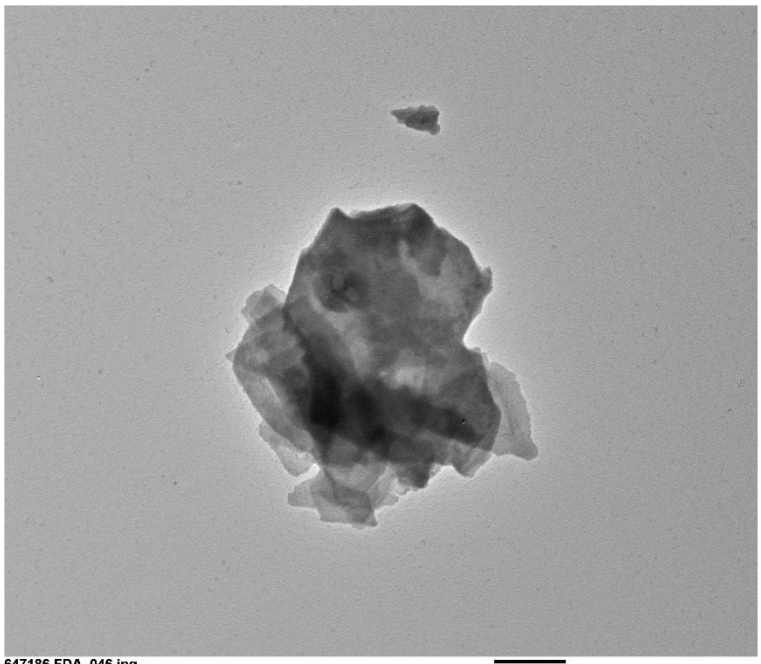
TEM

(b) (6) analyzed aliquot 5 on August 17, 2023. (b) (6) analyzed aliquot 5A on August 17, 2023, and aliquot 5B on August 23, 2023. The primary particles observed were talc and titanium; mica particles were also observed along with talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-5	No Asbestos Detected
647186-5A	No Asbestos Detected
647186-5B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-5, Talc Particle

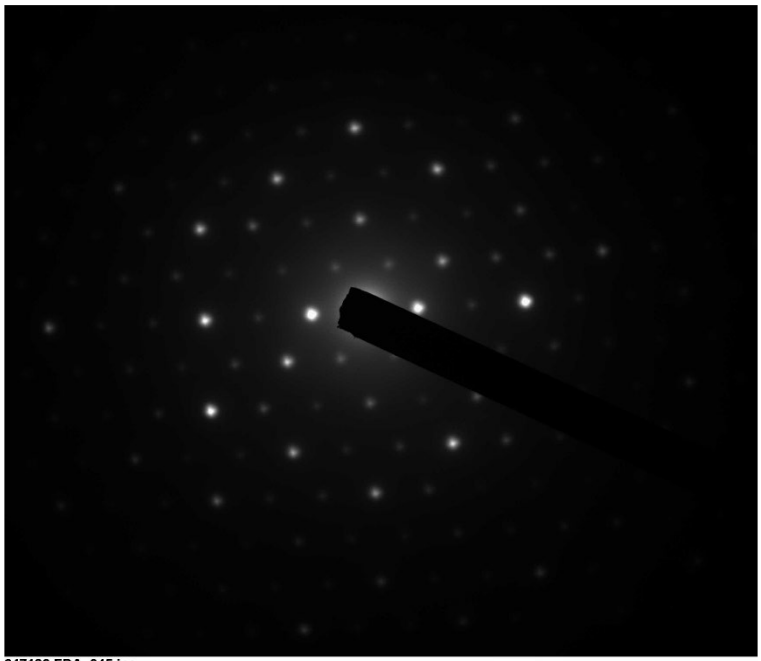


647186 FDA_046.jpg
647186-5
Talc particle

Cal: 0.002387 µm/pix
15:07 2023-08-17
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

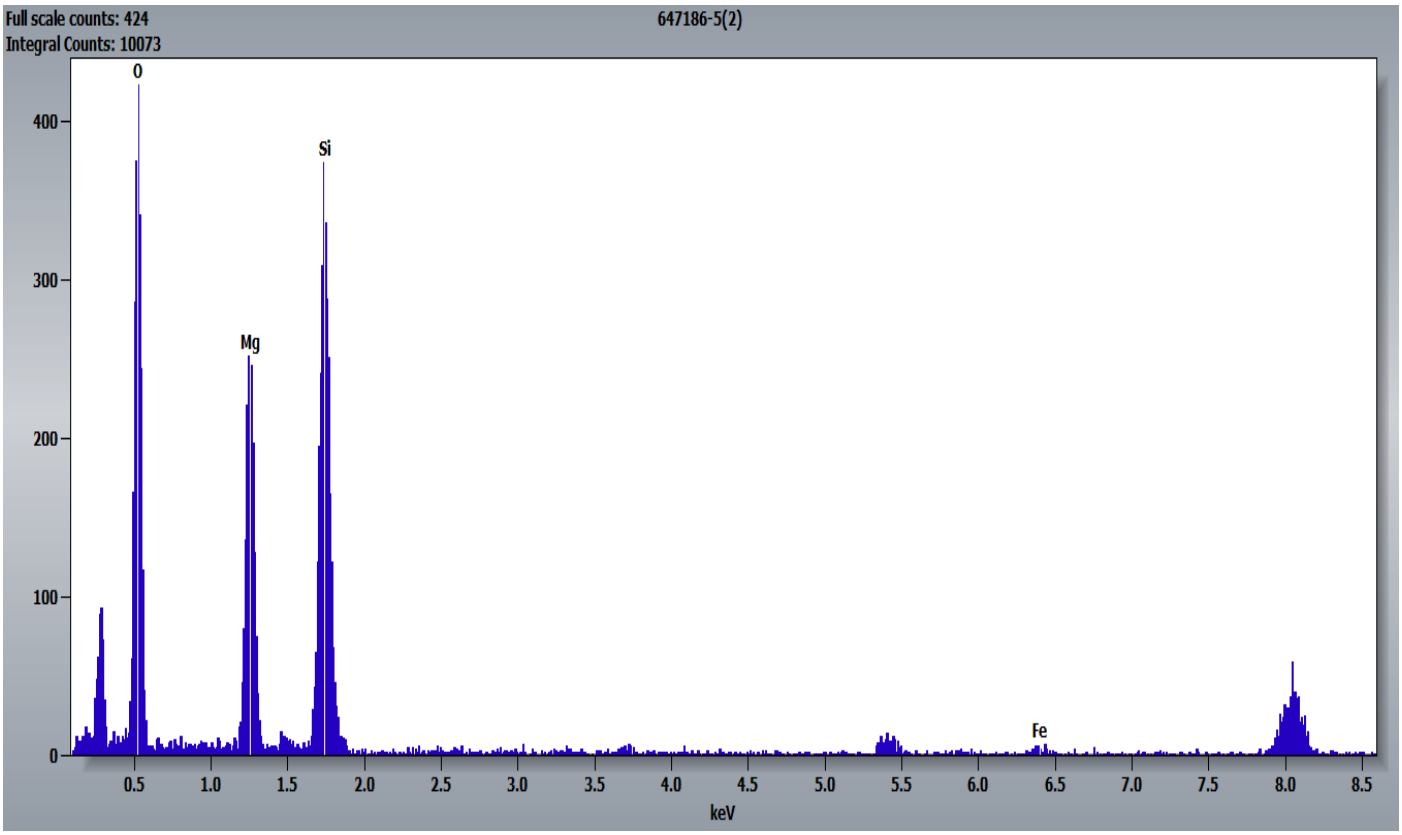


647186 FDA_045.jpg
647186-5
Talc particle

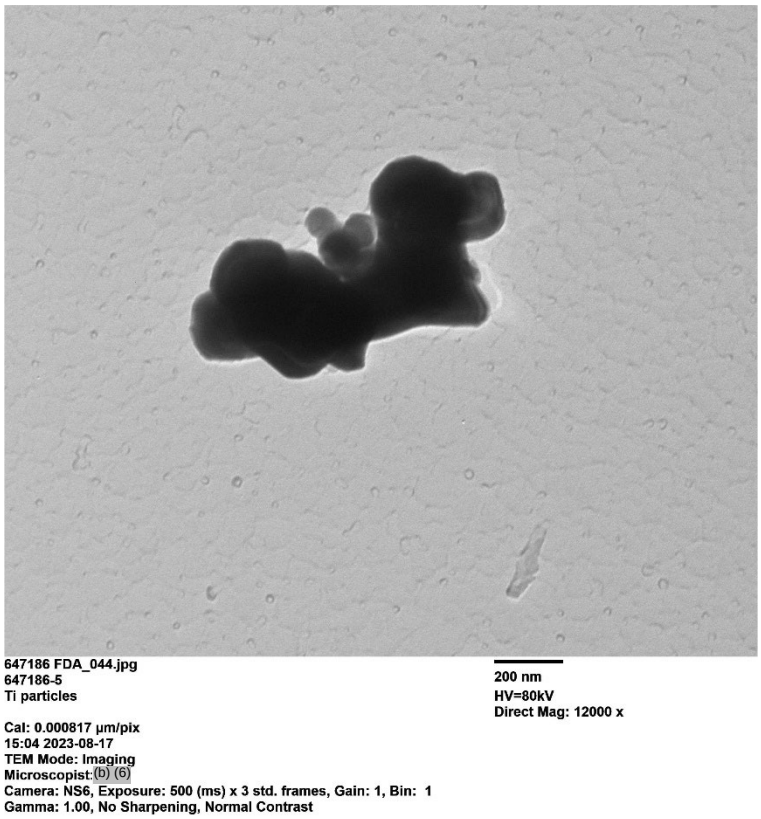
Cal: 0.000817 µm/pix
15:06 2023-08-17
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

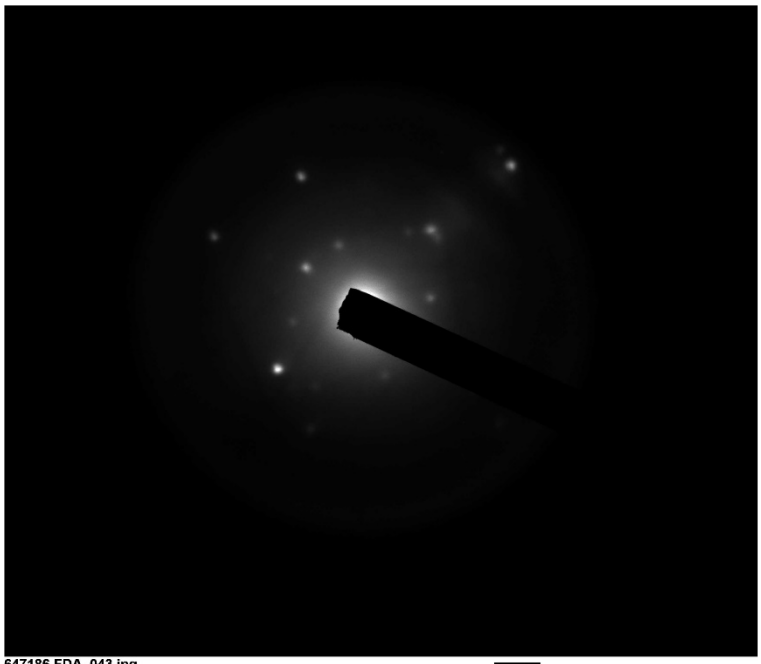
Chemistry from the Talc Particle Pictured Above



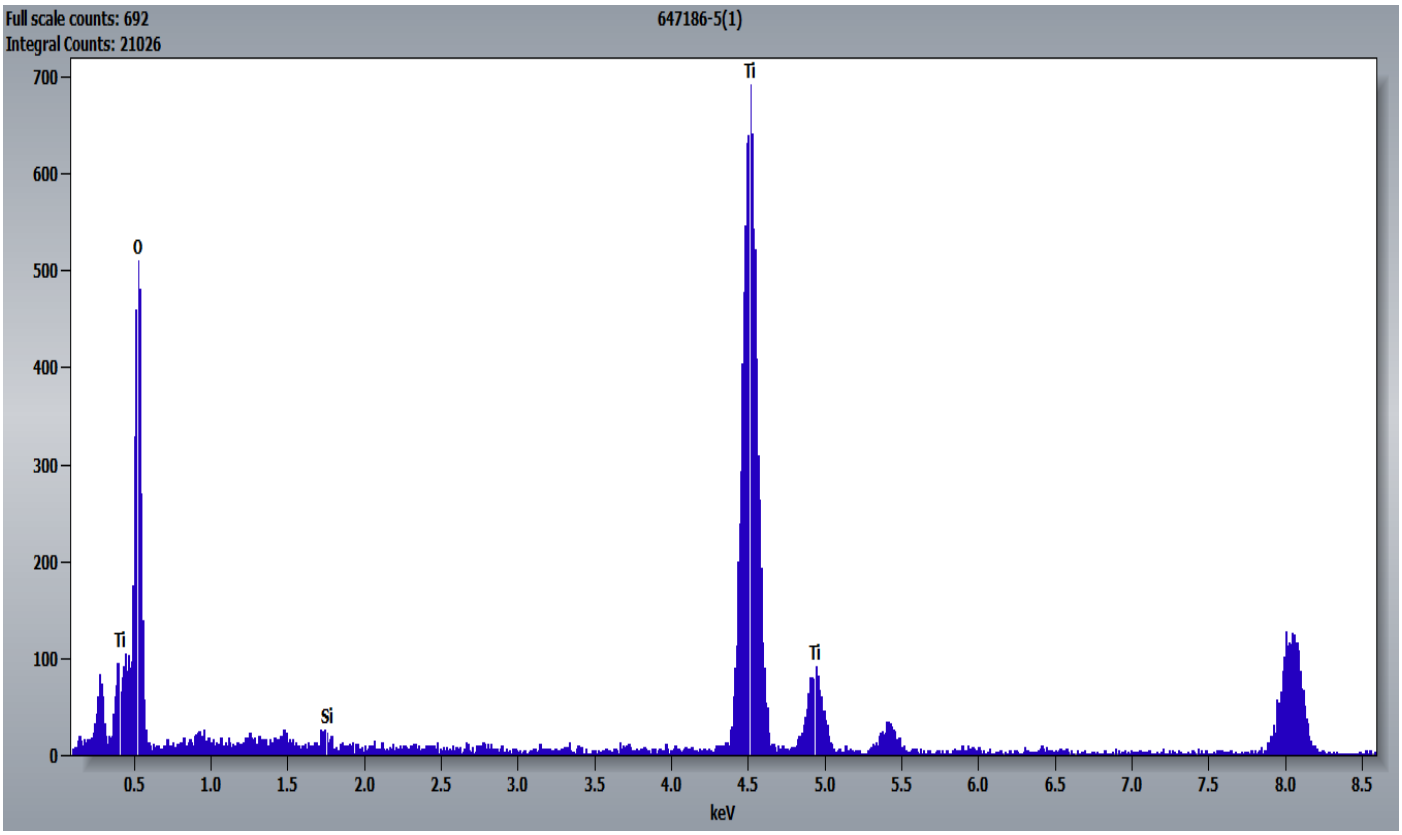
647186-5, Titanium Particles



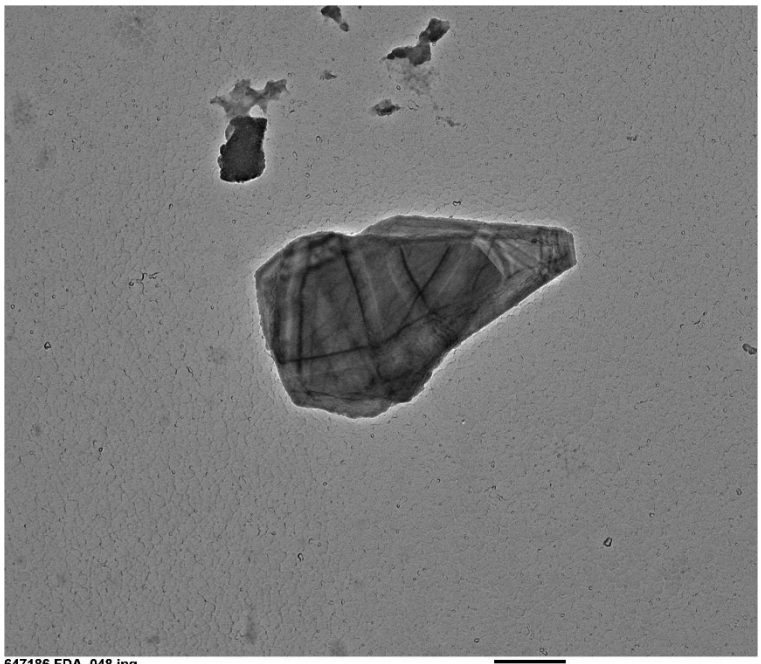
Diffraction Pattern from the Titanium Particles Pictured Above



Chemistry from the Titanium Particles Pictured Above



647186-5, Mica Particle

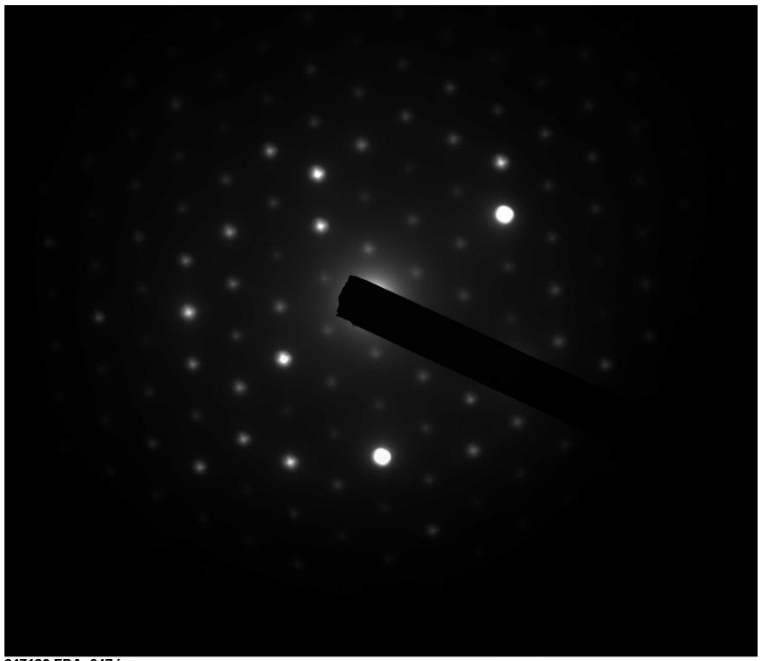


647186 FDA_048.jpg
647186-5
Mica particle

Cal: 0.002387 µm/pix
15:15 2023-08-17
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

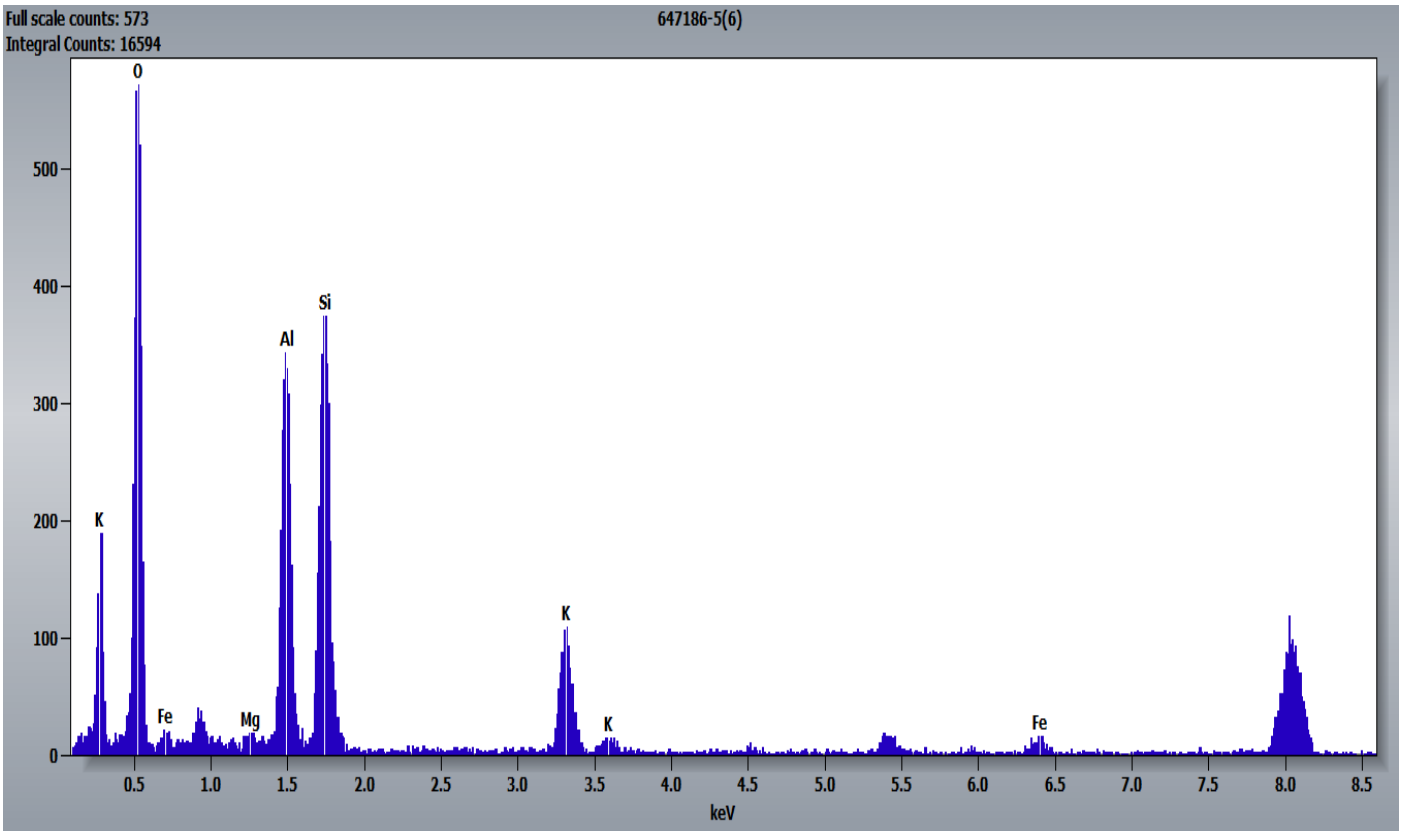


647186 FDA_047.jpg
647186-5
Mica particle

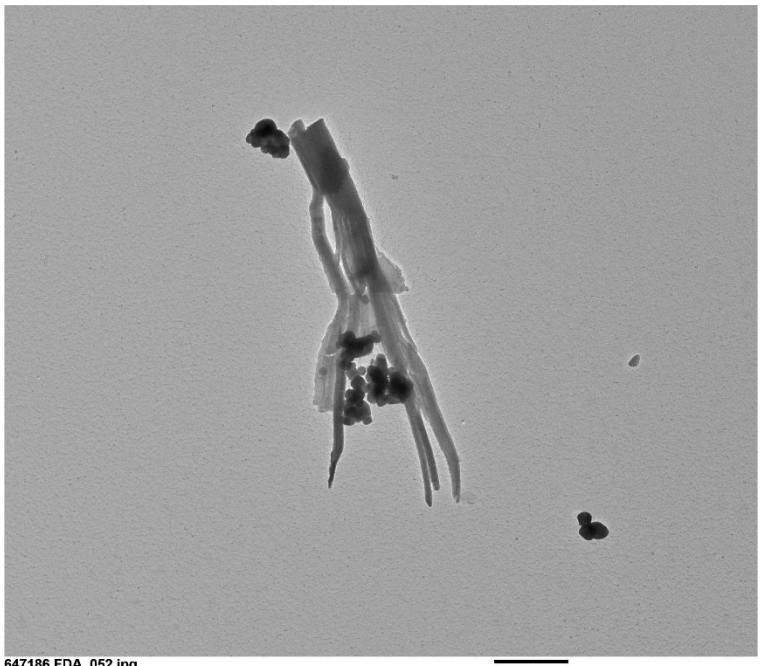
Cal: 0.002387 µm/pix
15:14 2023-08-17
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

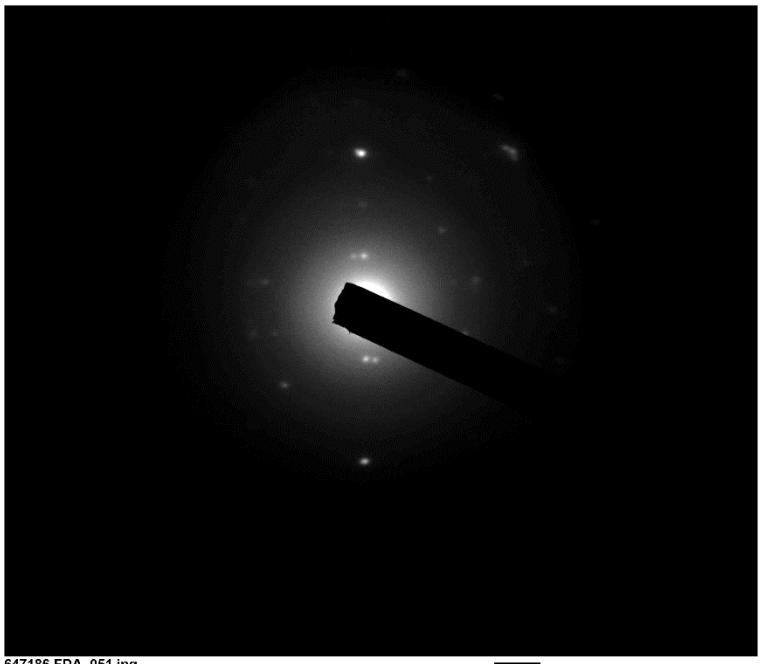
Chemistry from the Mica Particle Pictured Above



647186-5, Talc Ribbon



Diffraction Pattern from the Talc Ribbon Pictured Above

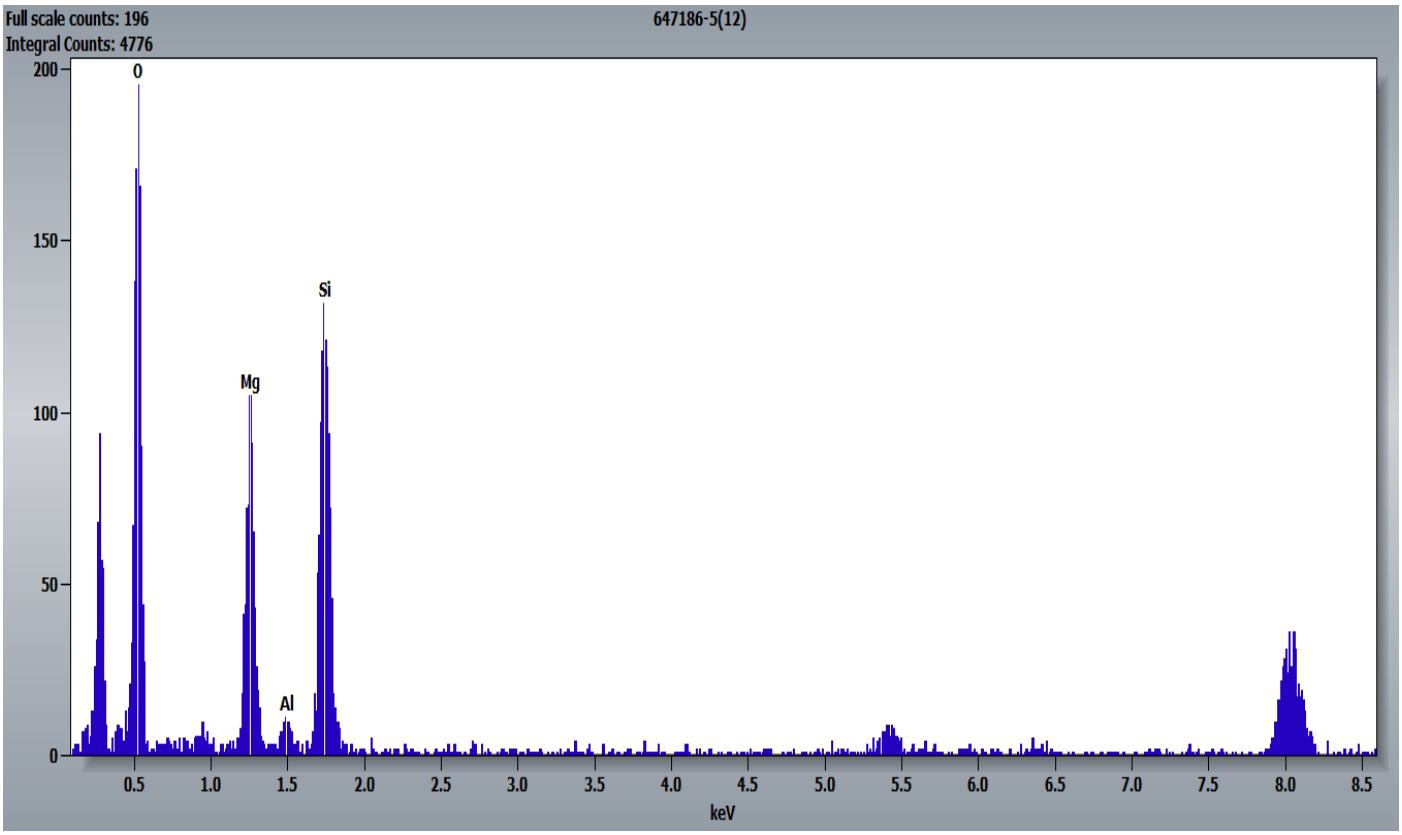


647186 FDA_051.jpg
647186-5
Talc ribbon

Cal: 0.003819 µm/pix
15:56 2023-08-17
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



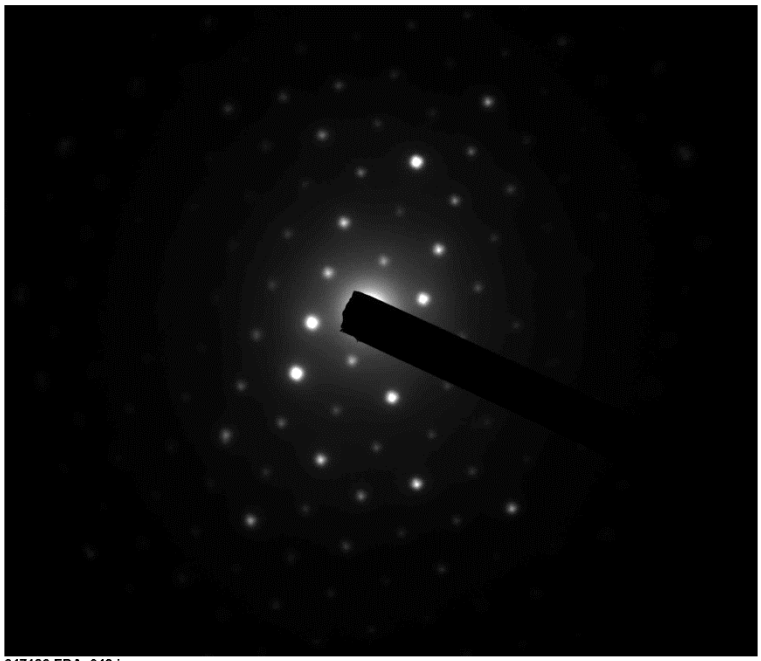
647186-5, Elongated Talc Particle

647186 FDA_050.jpg
647186-5
Talc fiber

Cal: 0.003819 µm/pix
15:45 2023-08-17
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

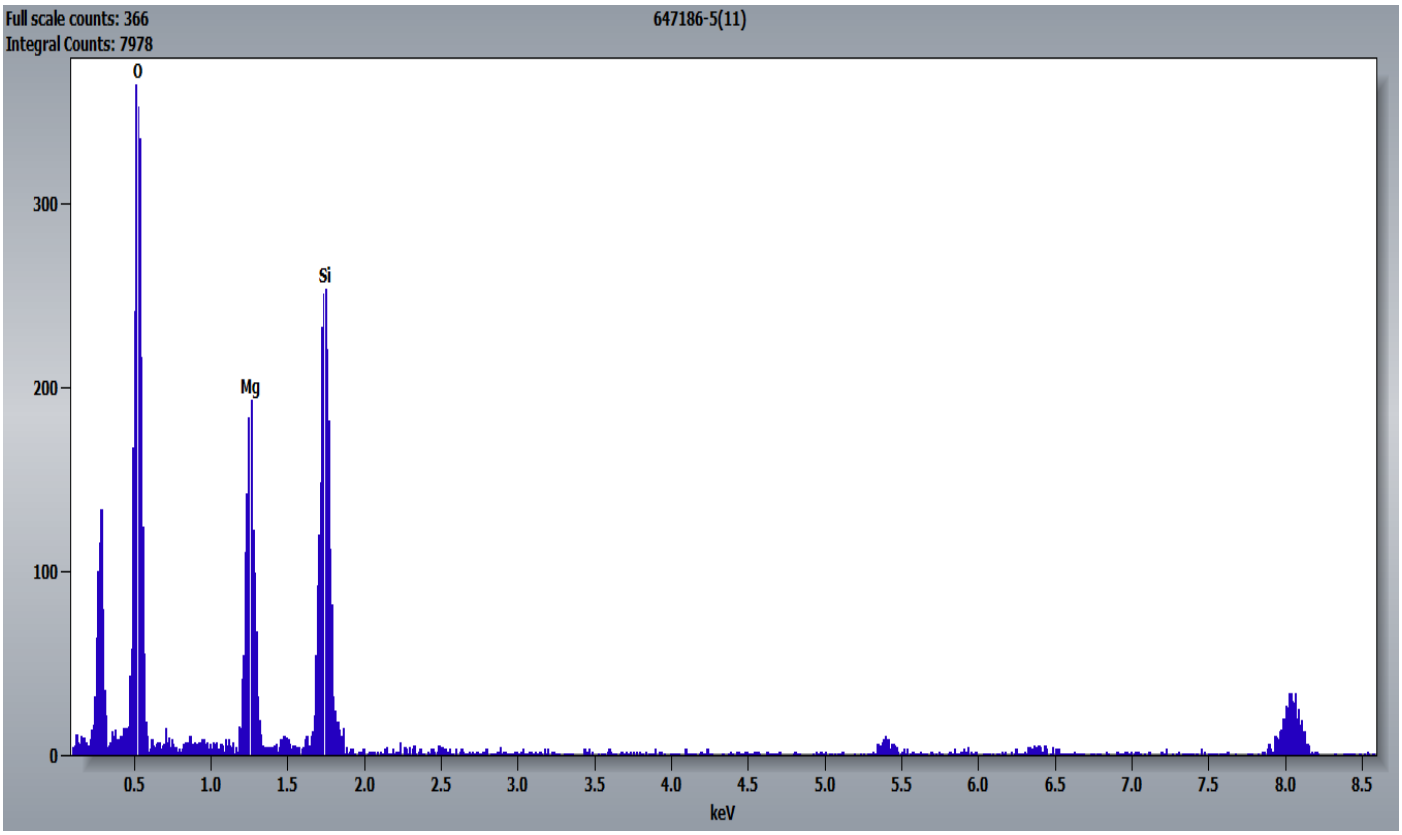


647186 FDA_049.jpg
647186-5
Talc fiber

Cal: 0.002387 µm/pix
15:45 2023-08-17
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Talc Particle Pictured Above



647186-6, 6A, 6B/Client Sample: 05162023-6

PLM

All three aliquots of sample 05162023-6 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-6	No Asbestos Detected
647186-6A	No Asbestos Detected
647186-6B	No Asbestos Detected

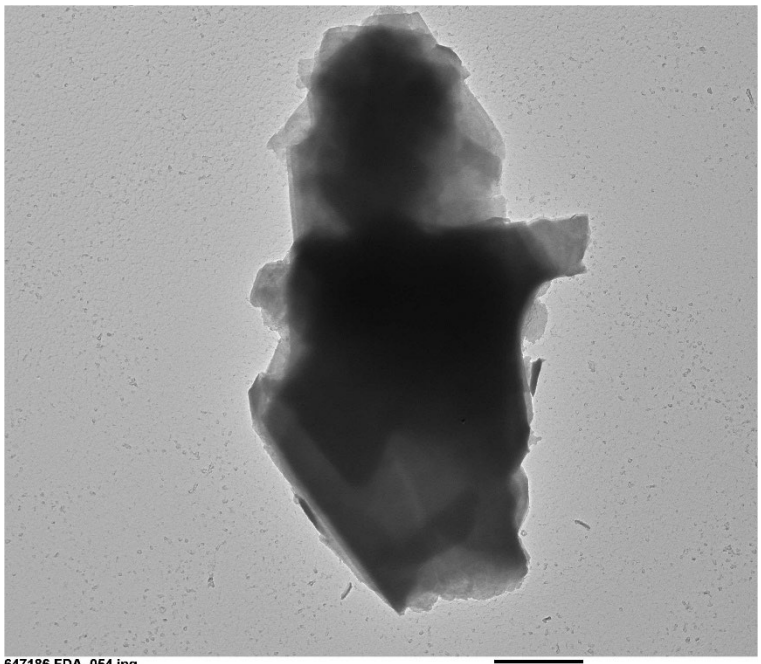
TEM

(b) (6) analyzed aliquot 6 August 21, 2023. (b) (6) analyzed aliquots 6A and 6B on August 23, 2023. The primary particle observed was talc; silica spheres and elongated silicon particles were also observed along with talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-6	No Asbestos Detected
647186-6A	No Asbestos Detected
647186-6B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

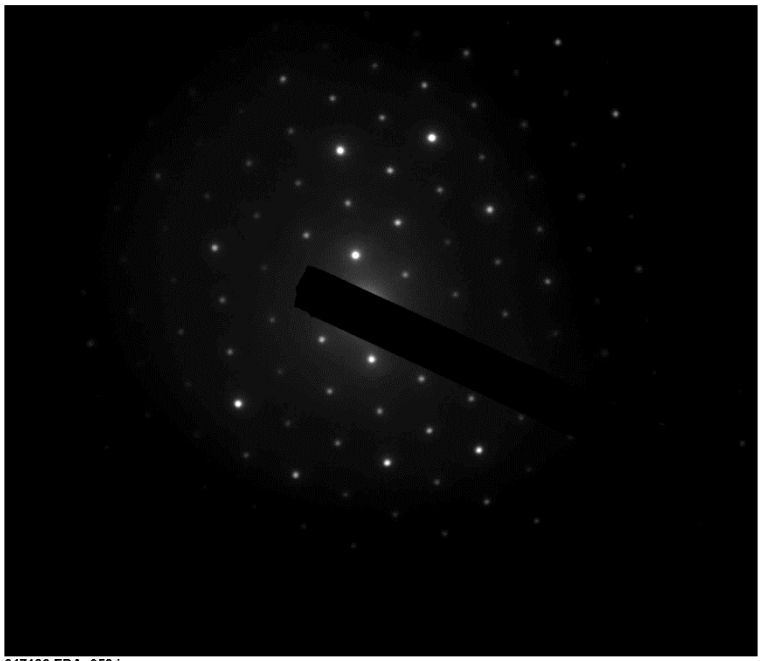
647186-6, Talc Particle



647186 FDA_054.jpg
647186-6
Talc
FDA
Cal: 0.003183 µm/pix
11:38 2023-08-21
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 3000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

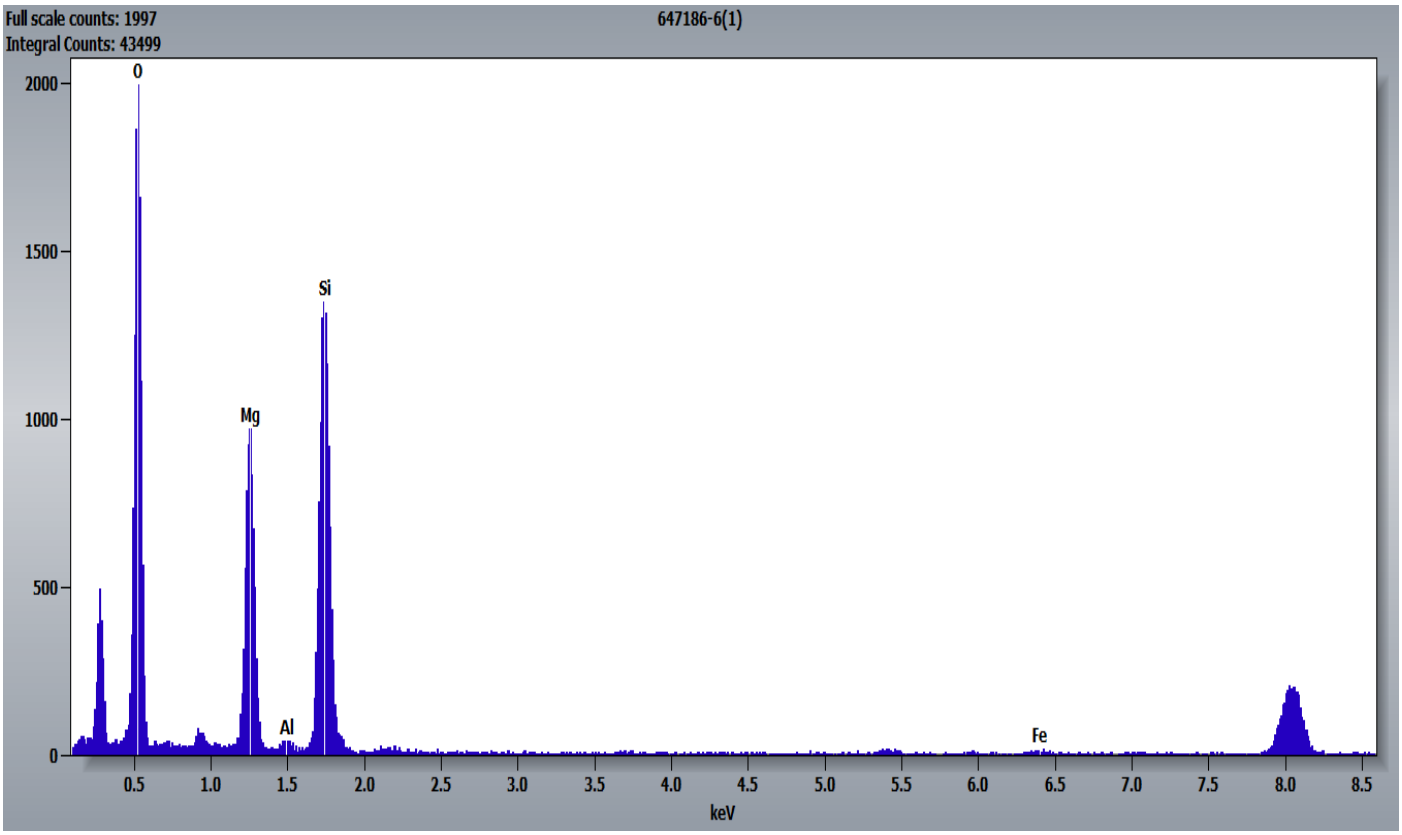


647186 FDA_053.jpg
647186-6
Talc
FDA

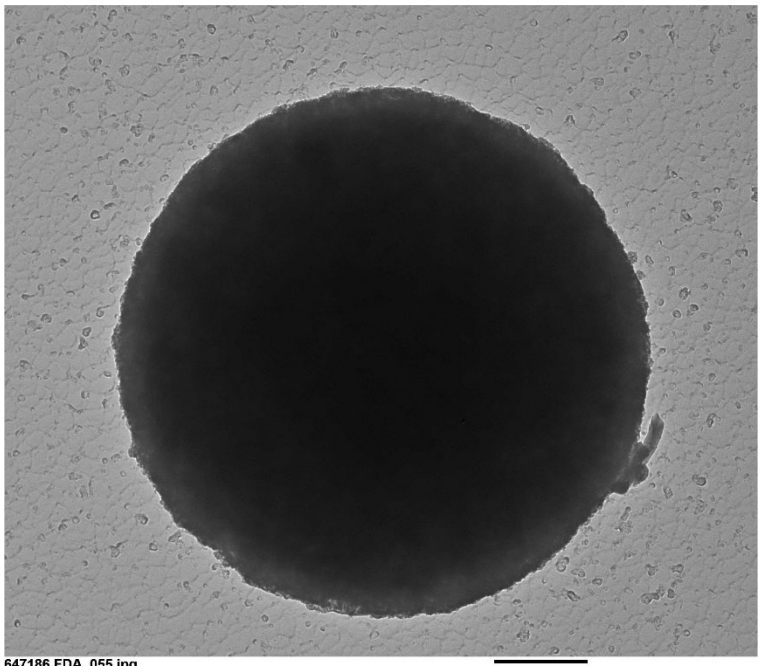
11:37 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

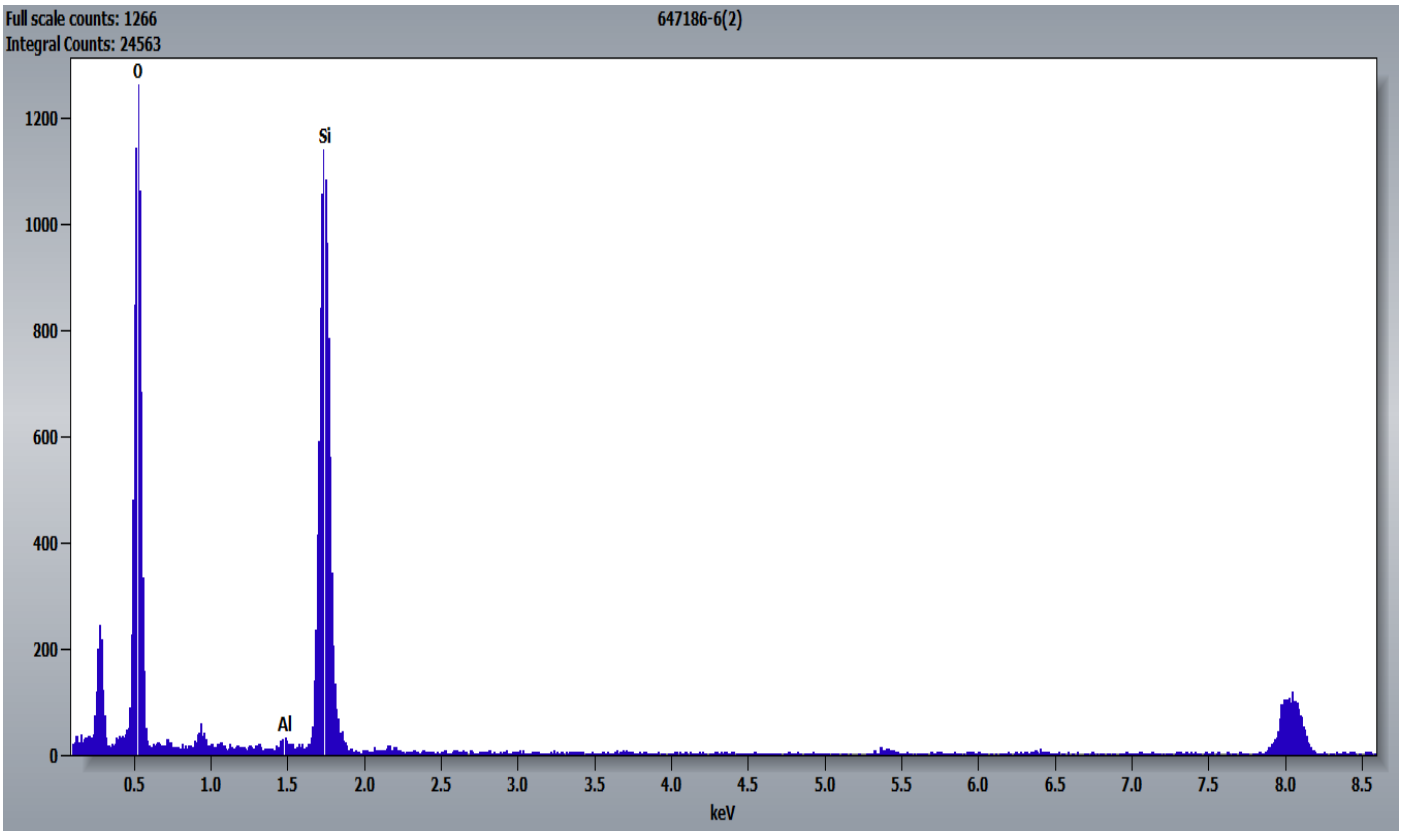
Chemistry from the Talc Particle Pictured Above



647186-6, Silica Sphere

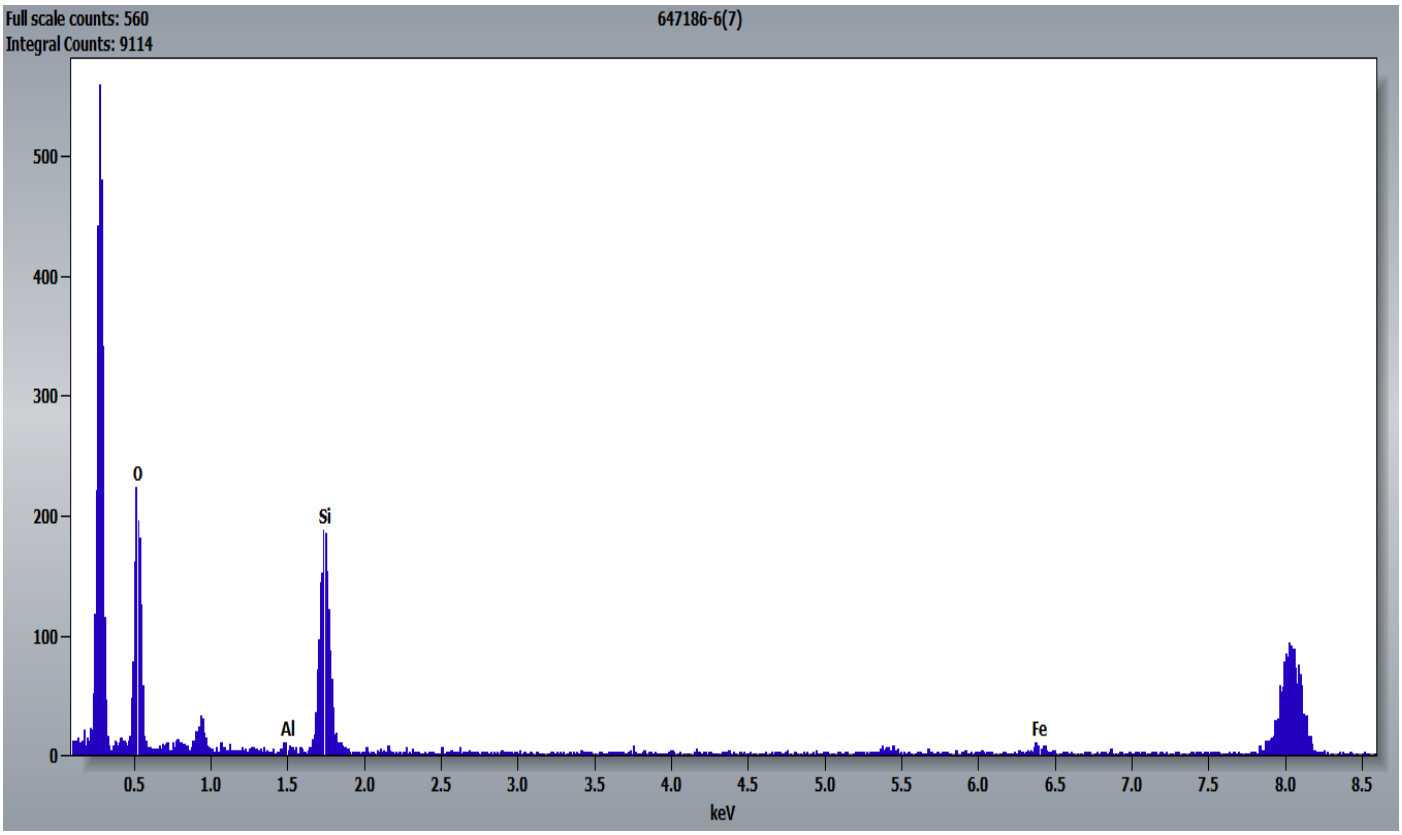


Chemistry from the Silica Sphere Pictured Above

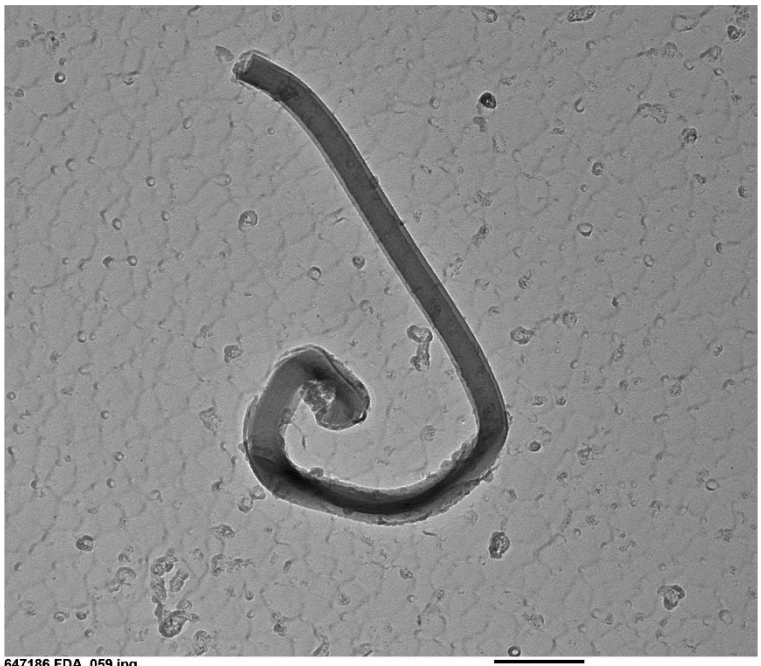


647186-6, Silicon Particle

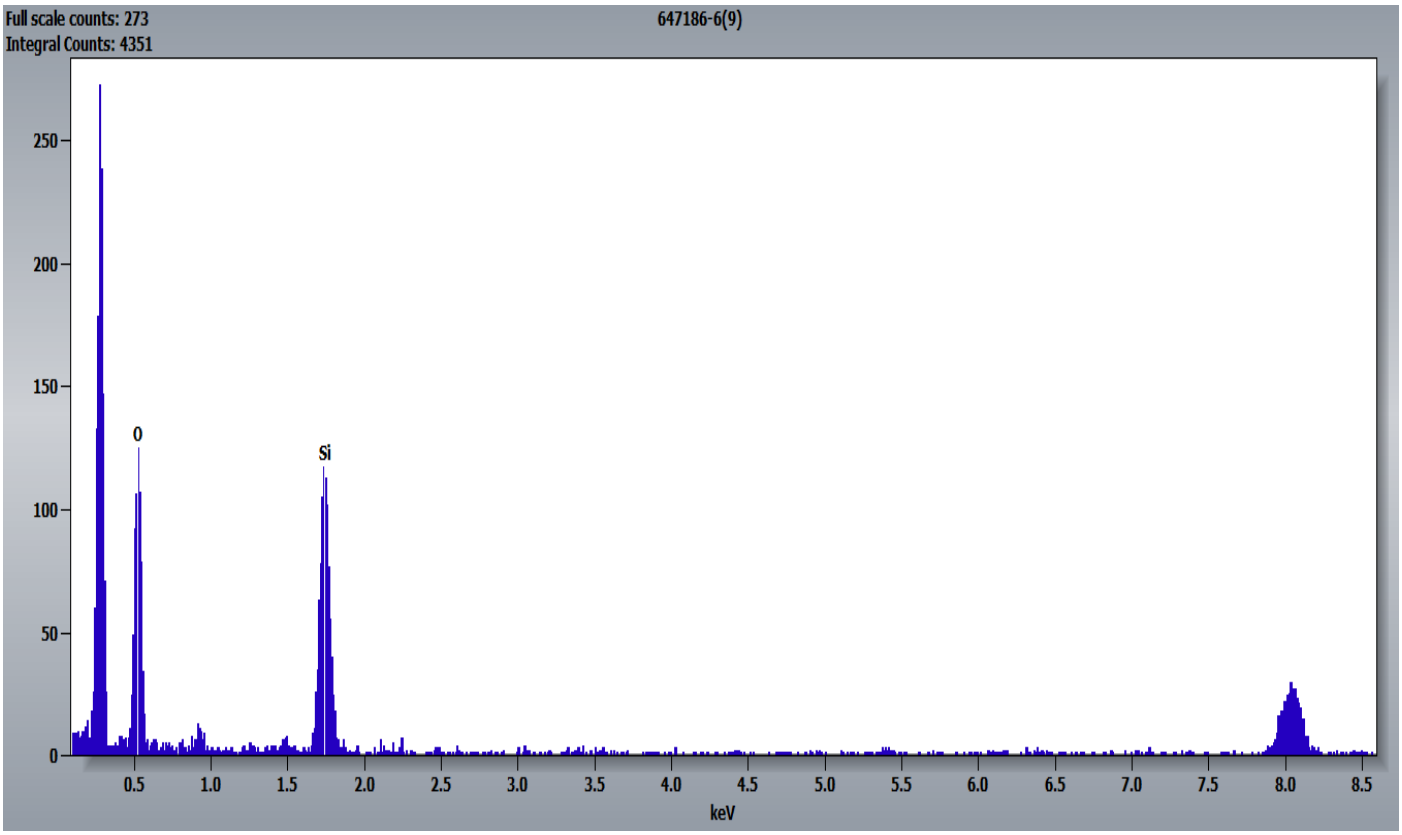
Chemistry from the Silicon Particle Pictured Above



647186-6, Silicon Particle

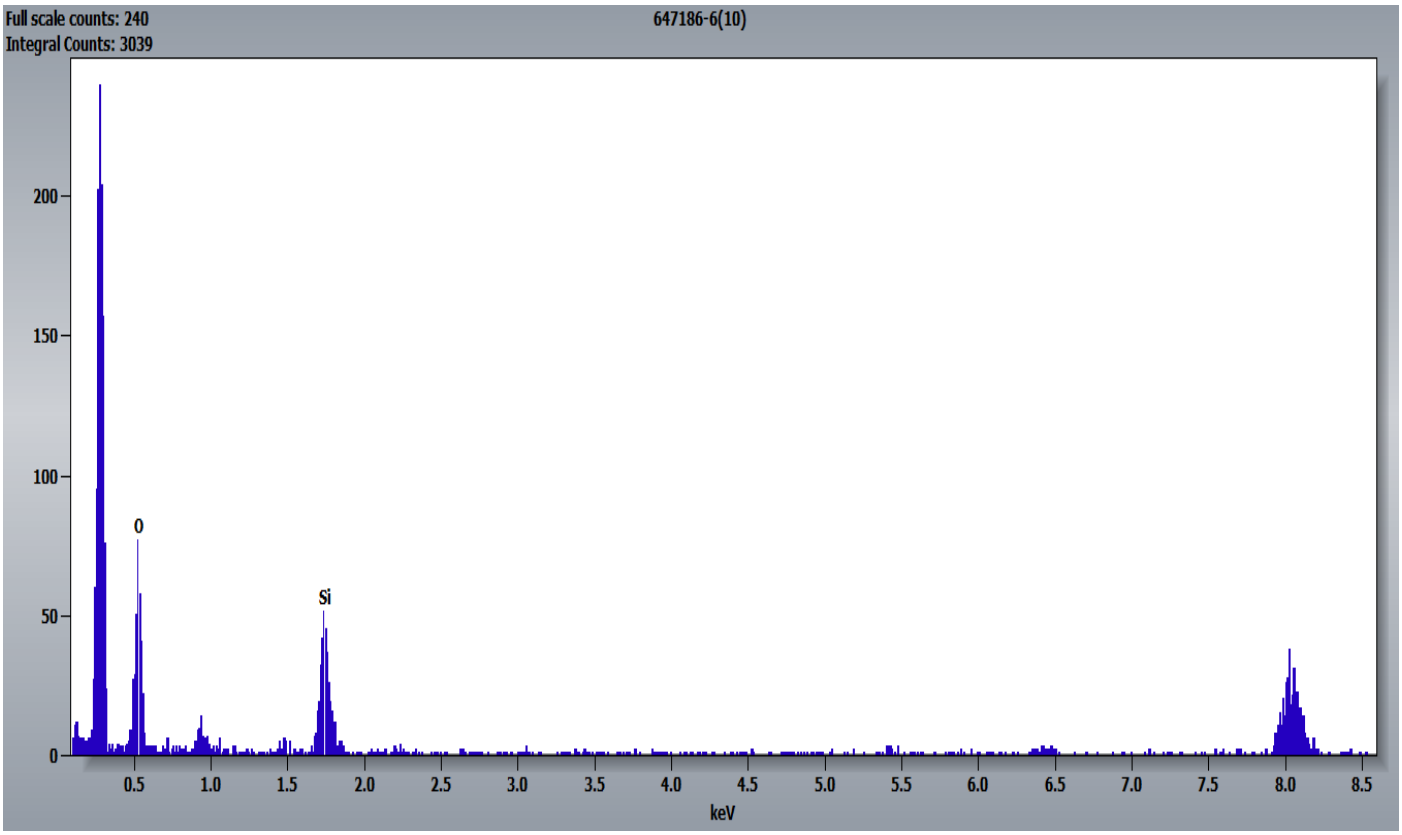


Chemistry from the Silicon Particle Pictured Above

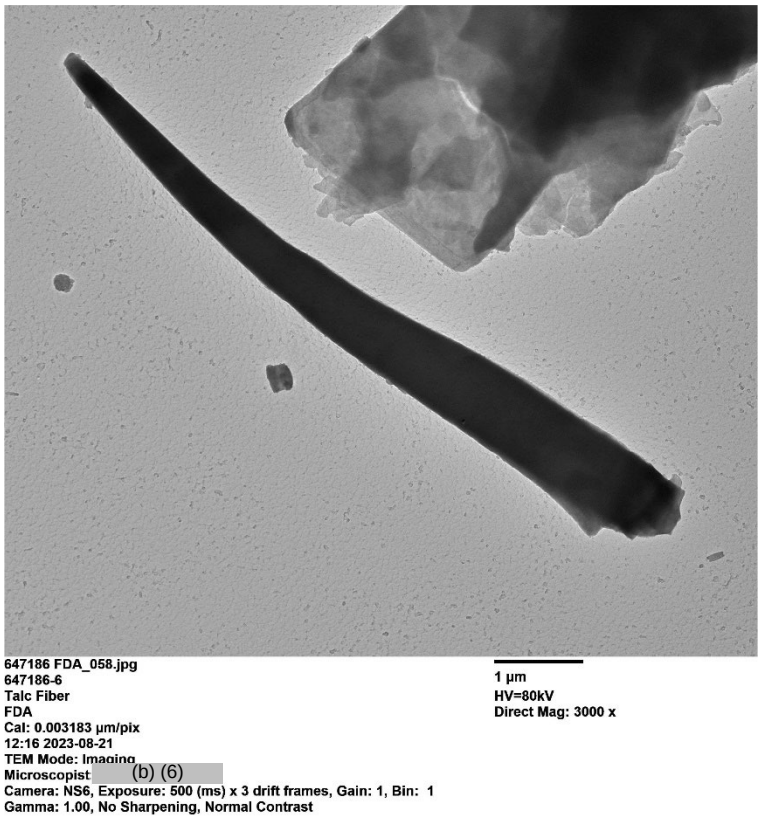


647186-6, Silicon Particle

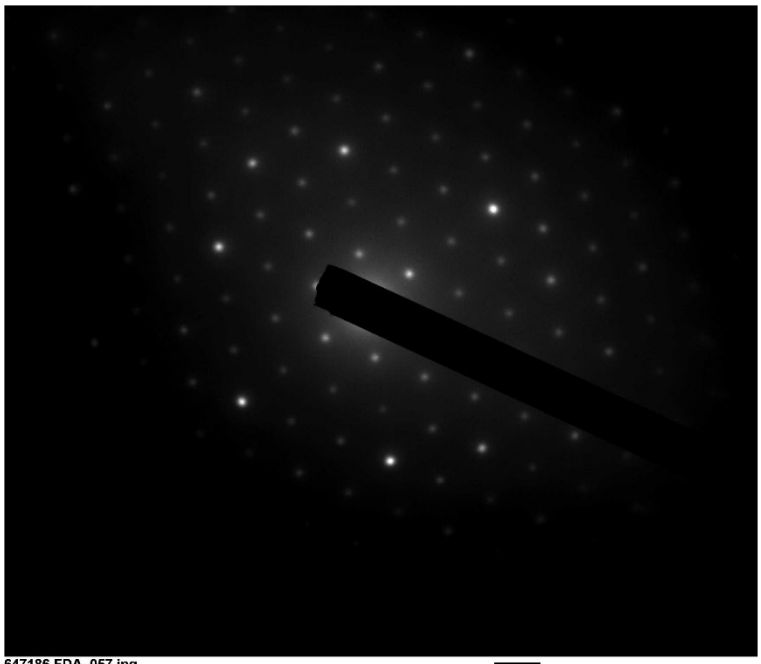
Chemistry from the Elongated Silicon Particle Pictured Above



647186-6, Elongated Talc Particle



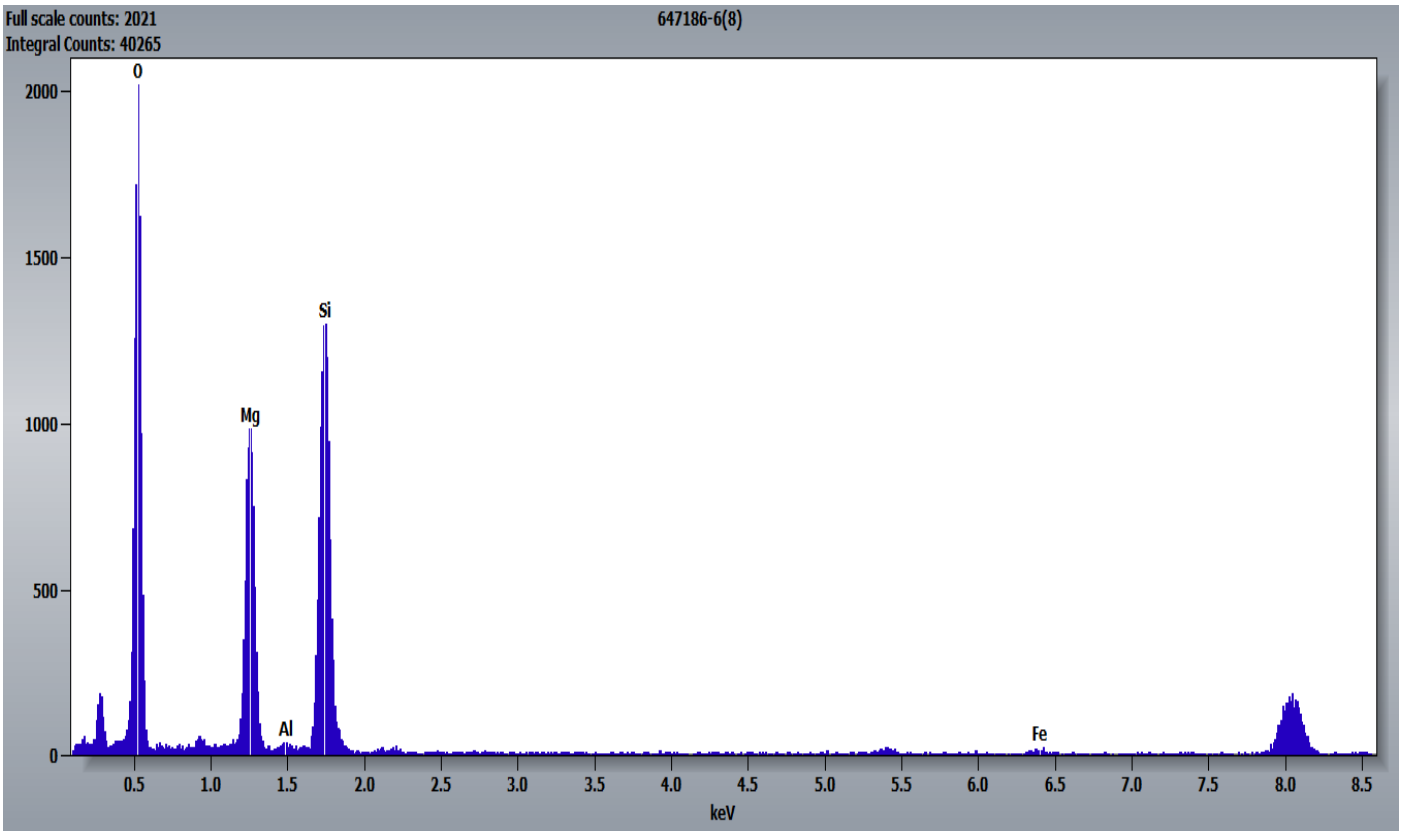
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



647186 FDA_057.jpg
647186-6
Talc Fiber
FDA
Cal: 0.000477 µm/pix
12:13 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Talc Particle Pictured Above



647186-7, 7A, 7B/Client Sample: 05162023-7

PLM

All three aliquots of sample 05162023-7 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-7	No Asbestos Detected
647186-7A	No Asbestos Detected
647186-7B	No Asbestos Detected

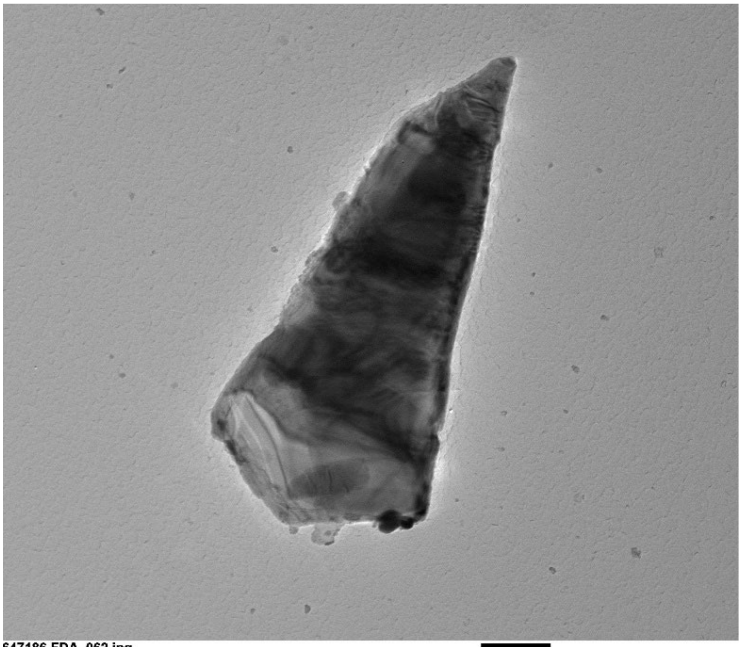
TEM

(b) (6) analyzed aliquot 7 on August 21, 2023. (b) (6) analyzed aliquots 7A and 7B on August 24, 2023. The primary particle observed was mica; titanium particles, silicon particles, and particles containing magnesium, aluminum, and silicon were also observed along with talc particles and silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-7	No Asbestos Detected
647186-7A	No Asbestos Detected
647186-7B	No Asbestos Detected

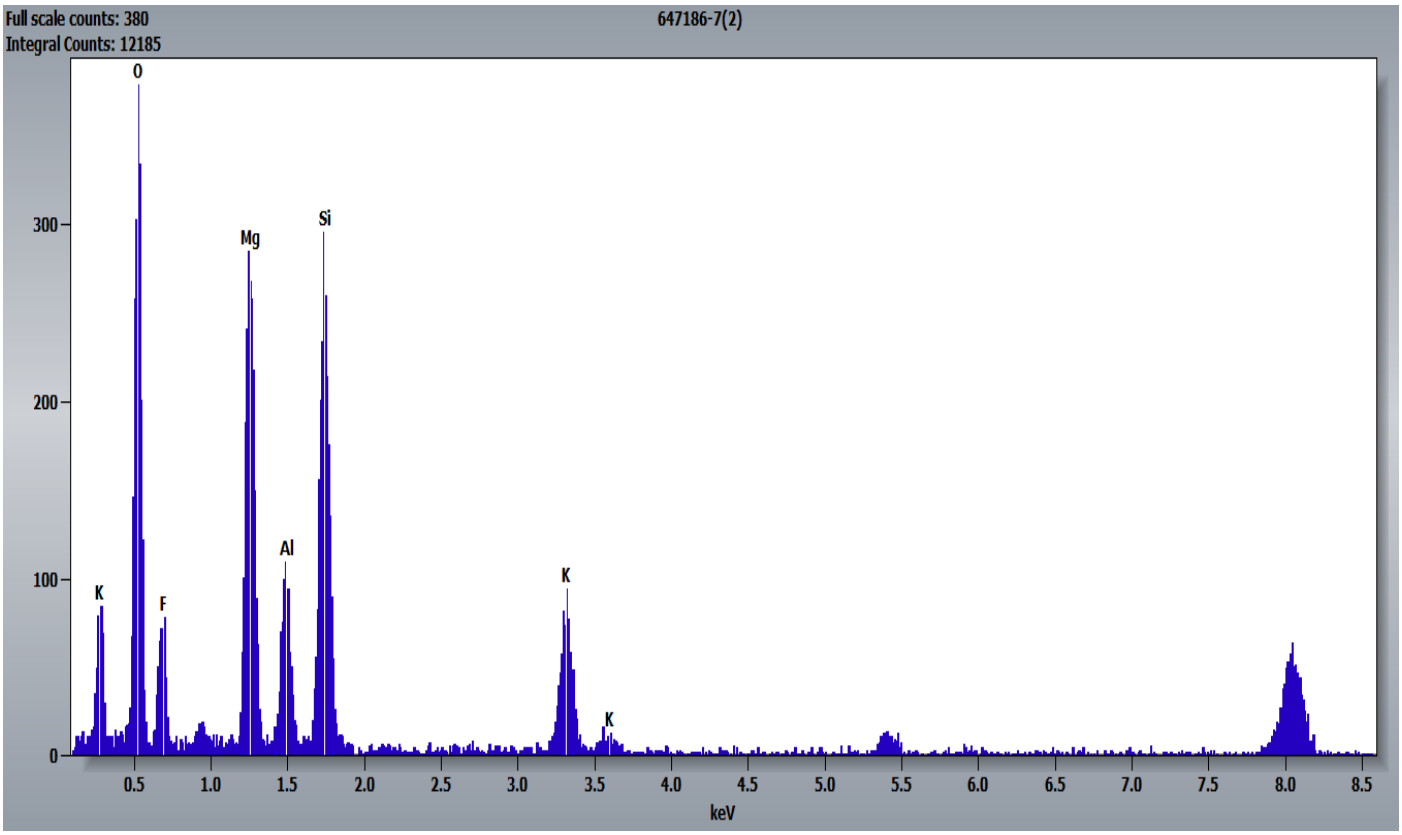
Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-7, Mica Particle

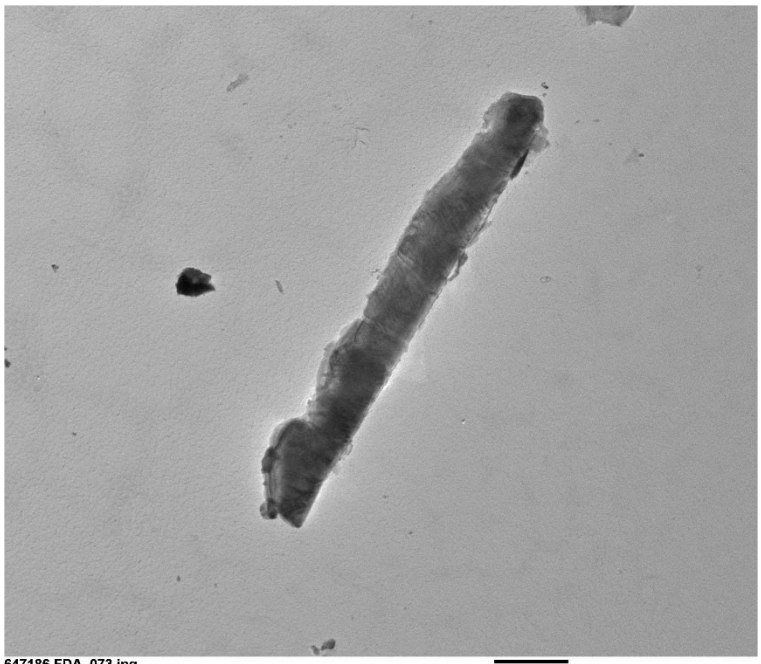


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

Chemistry from the Mica Particle Pictured Above



647186-7, Elongated Mica Particle

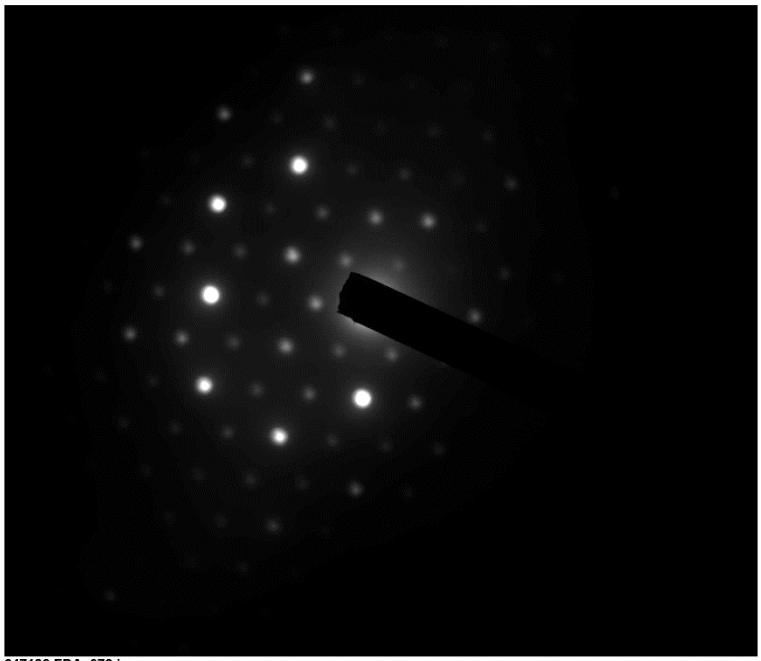


647186 FDA_073.jpg
647186-7
Elongated Mica

Cal: 0.003819 µm/pix
16:31 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

Hexagonal Diffraction Pattern from the Elongated Mica Particle Pictured Above

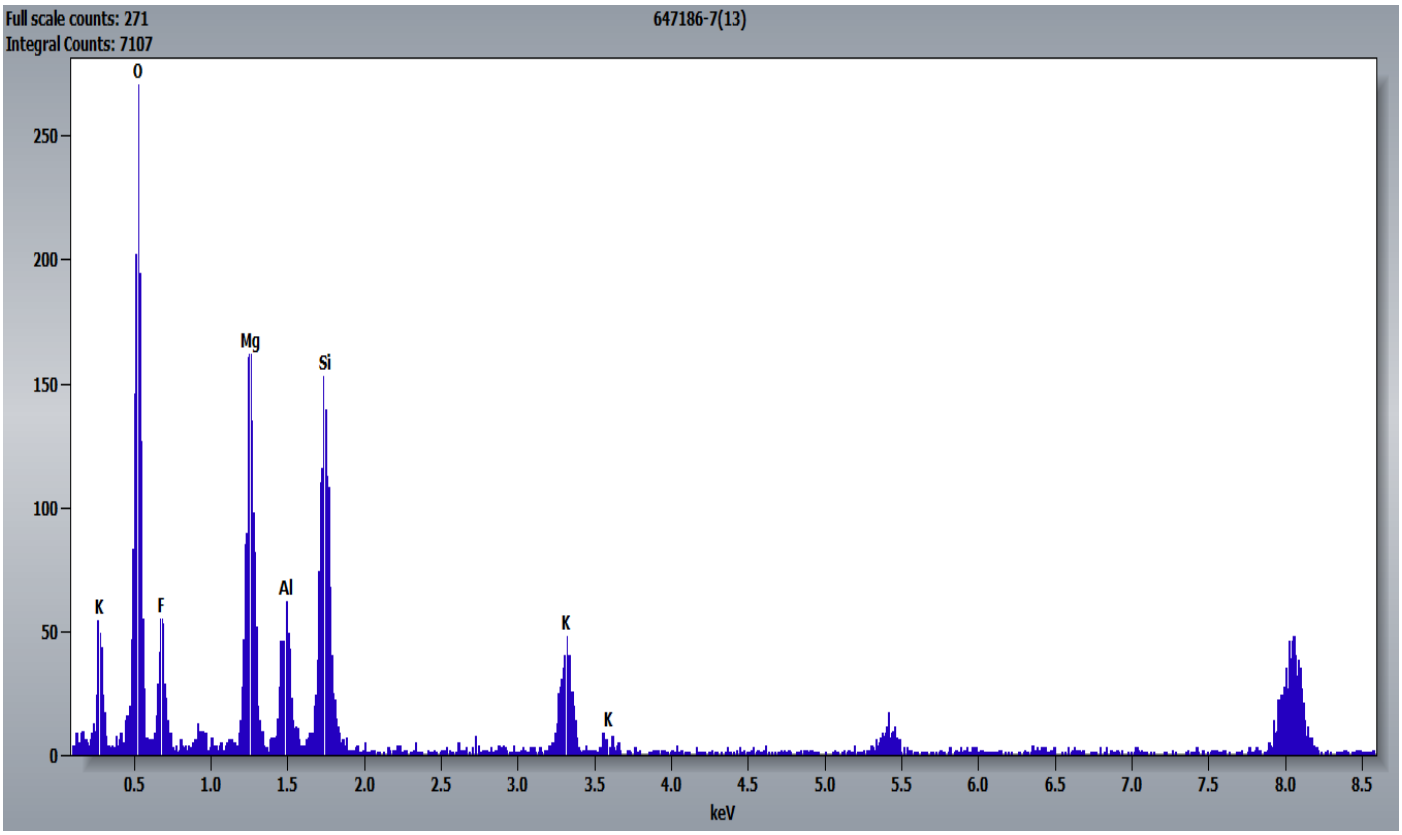


647186 FDA_072.jpg
647186-7
Elongated Mica

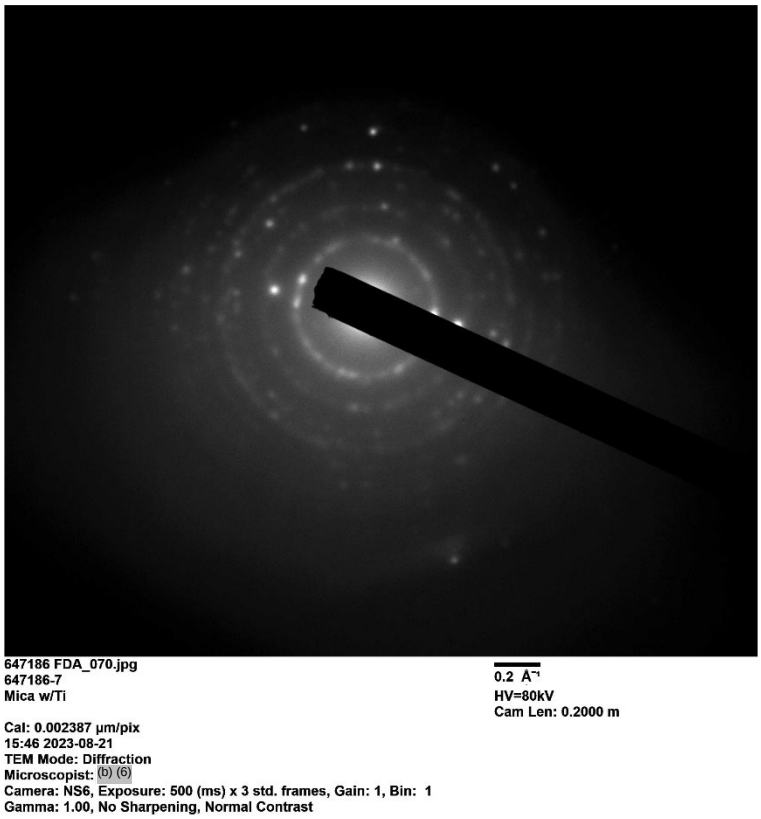
Cal: 0.003183 µm/pix
16:30 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

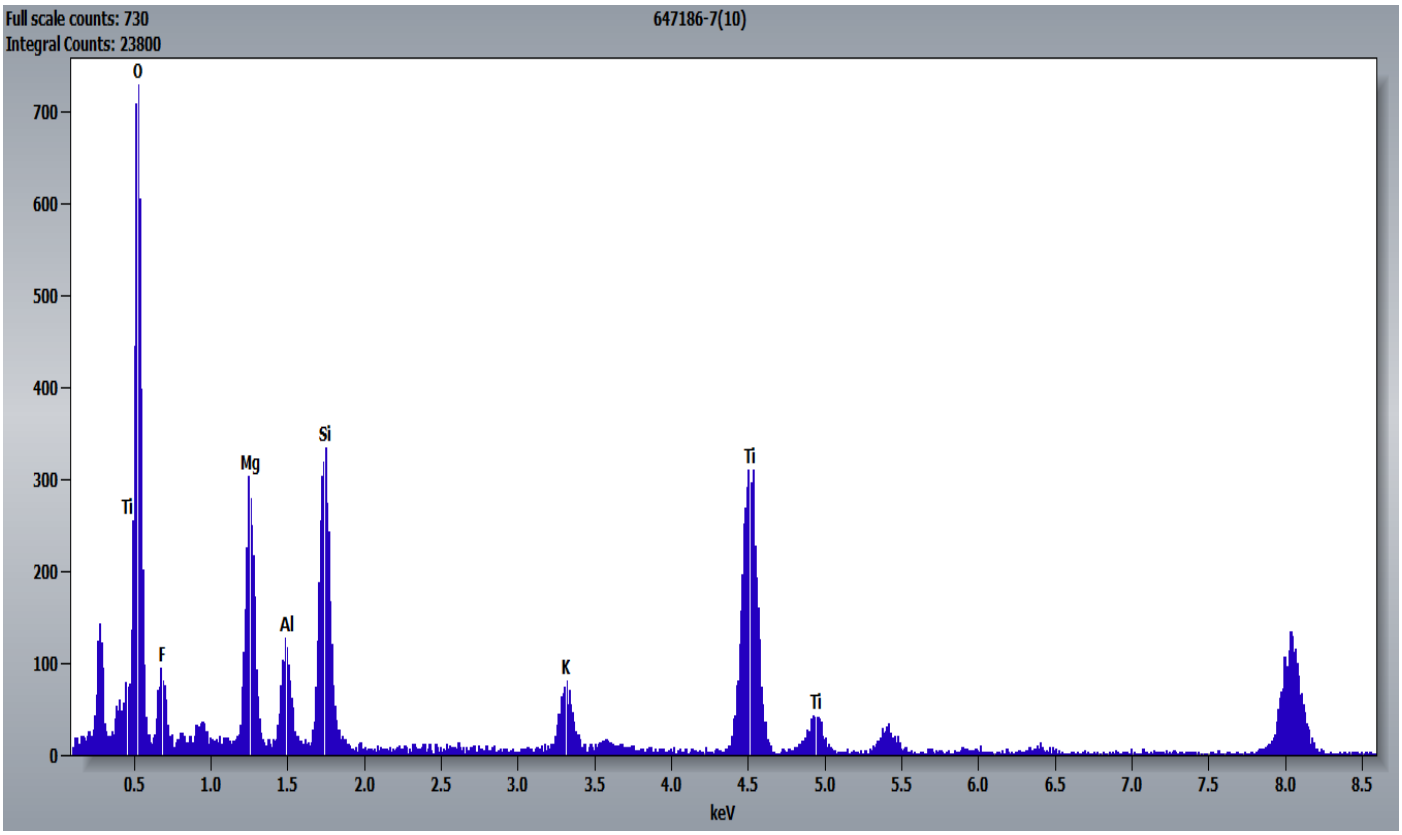
Chemistry from the Elongated Mica Particle Pictured Above



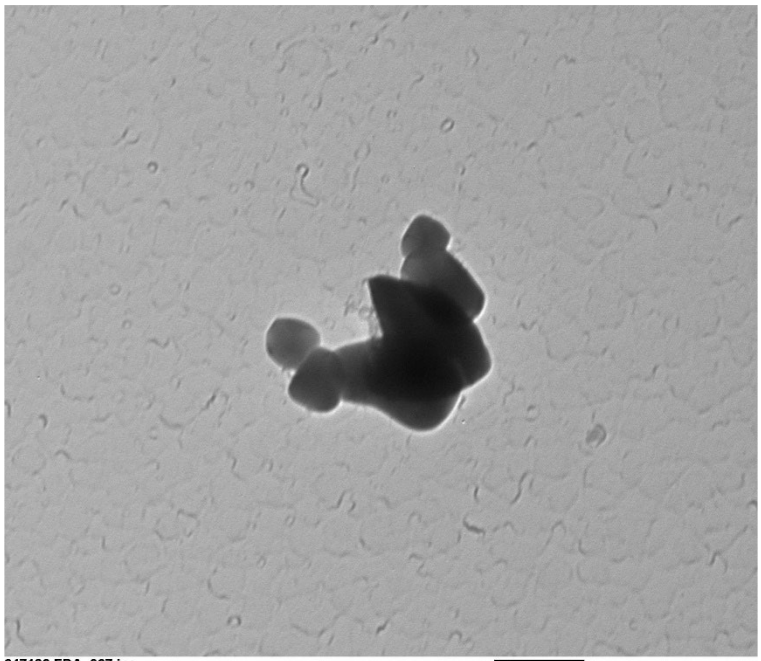
647186-7, Diffraction Pattern from Mica Particle with Titanium



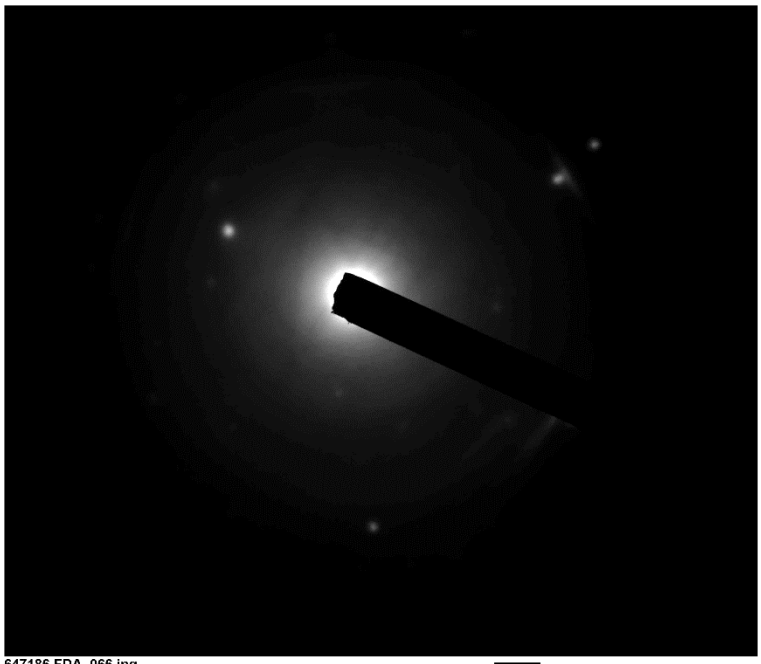
Chemistry from the Mica Particle with Titanium Referenced Above



647186-7, Titanium Particles



Diffraction Pattern from the Titanium Particles Pictured Above

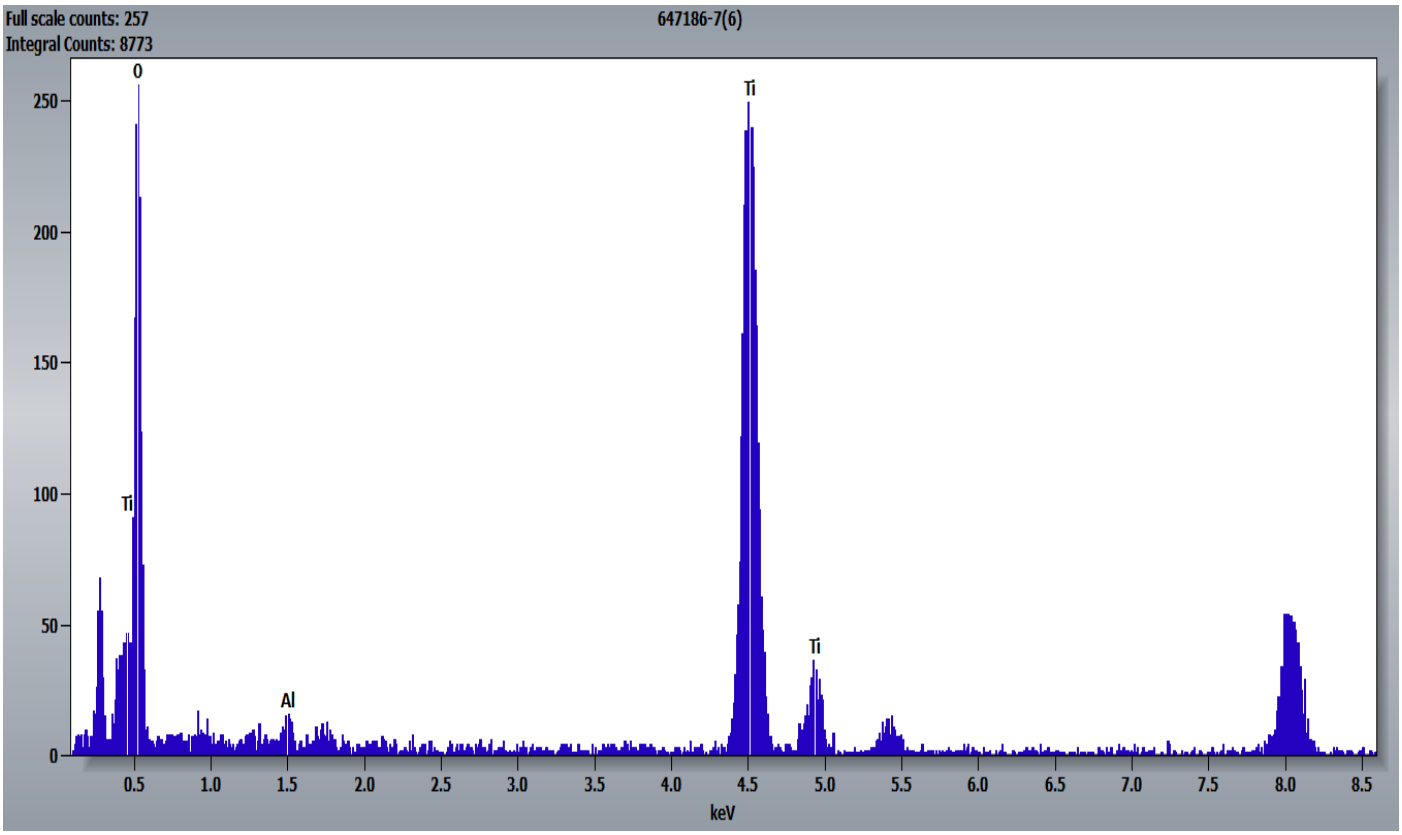


647186 FDA_066.jpg
647186-7
Ti particles

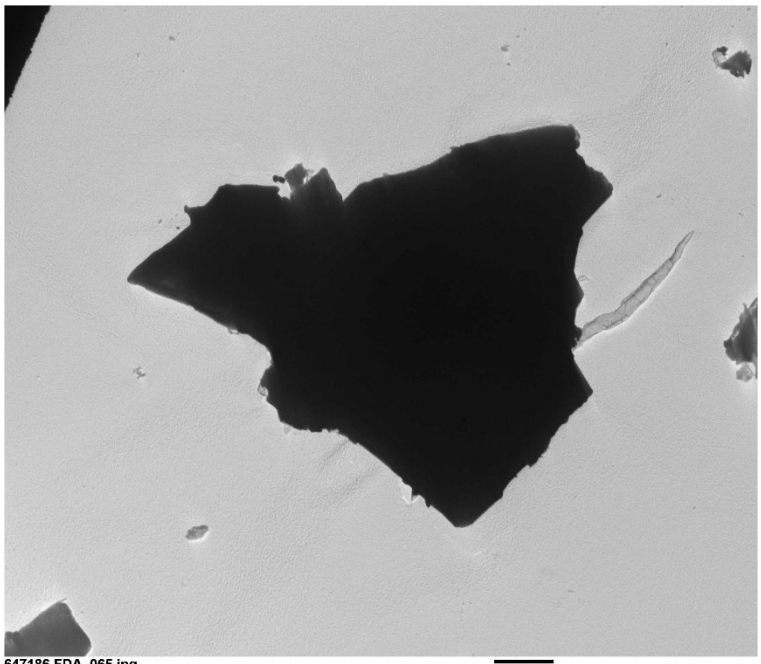
Cal: 0.009548 µm/pix
15:29 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Titanium Particles Pictured Above



647186-7, Silicon Particle

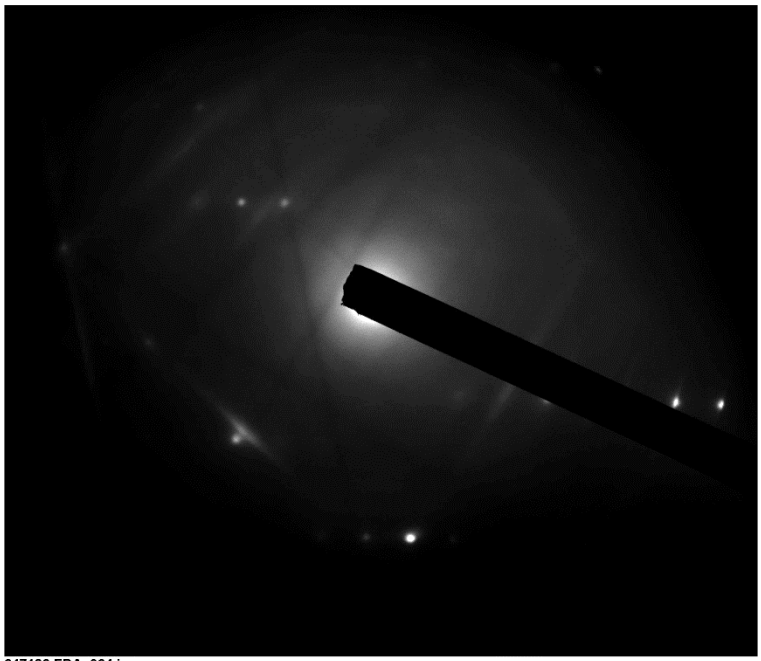


647186 FDA_065.jpg
647186-7
Si particle

Cal: 0.009548 µm/pix
15:25 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

2 µm
HV=80kV
Direct Mag: 1000 x

Diffraction Pattern from the Silicon Particle Pictured Above

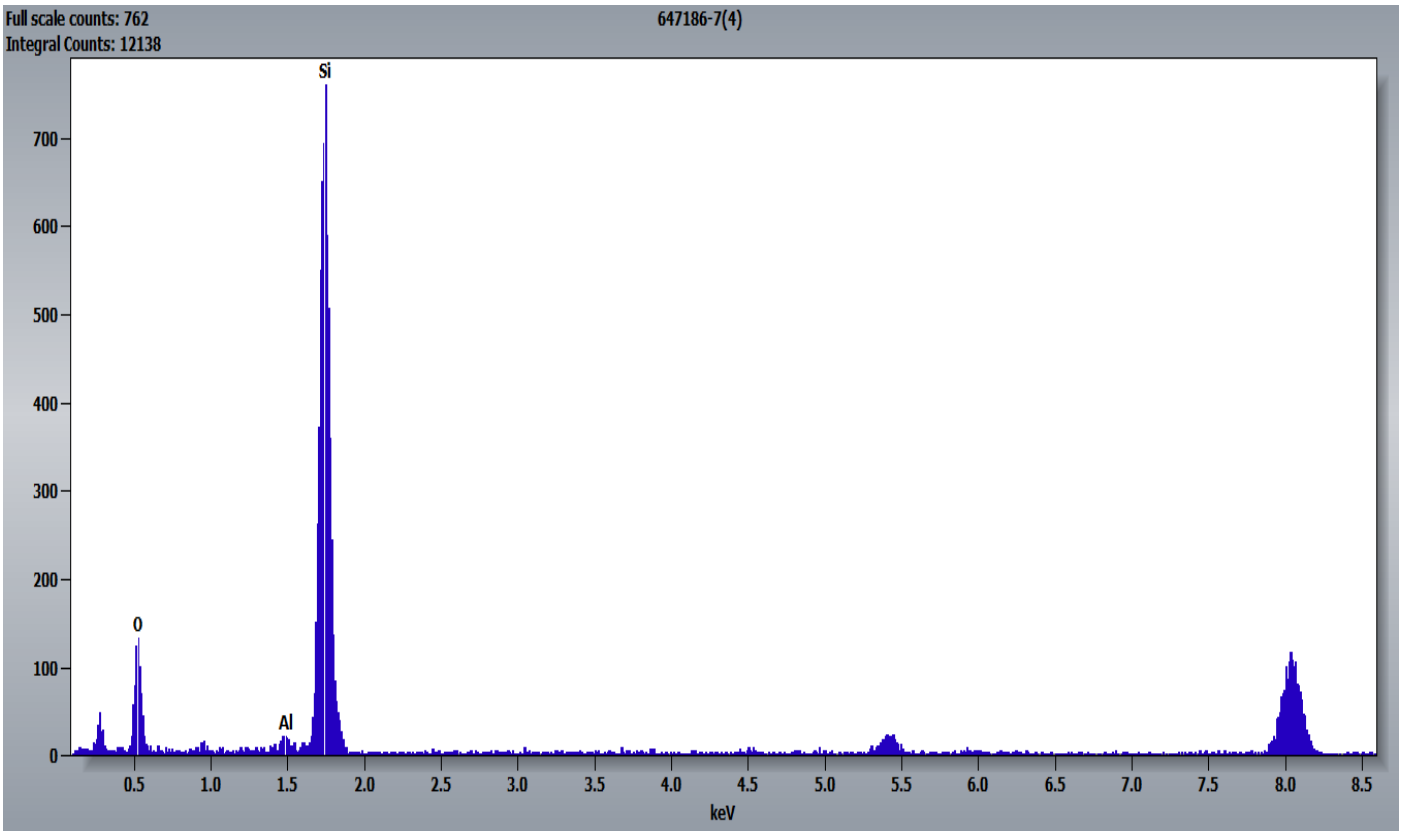


647186 FDA_064.jpg
647186-7
Si particle

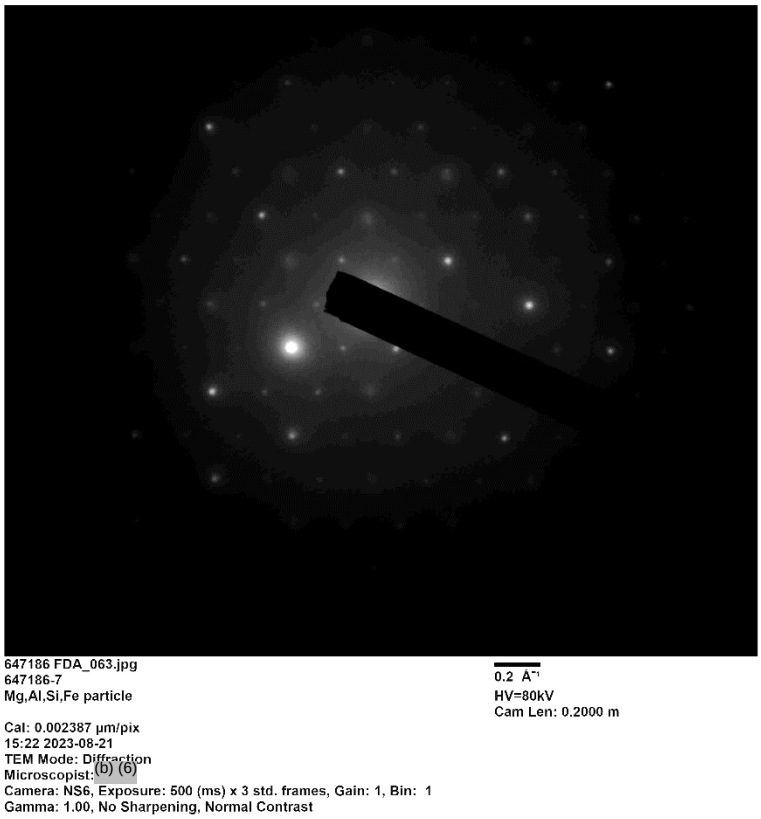
Cal: 0.002387 µm/pix
15:24 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

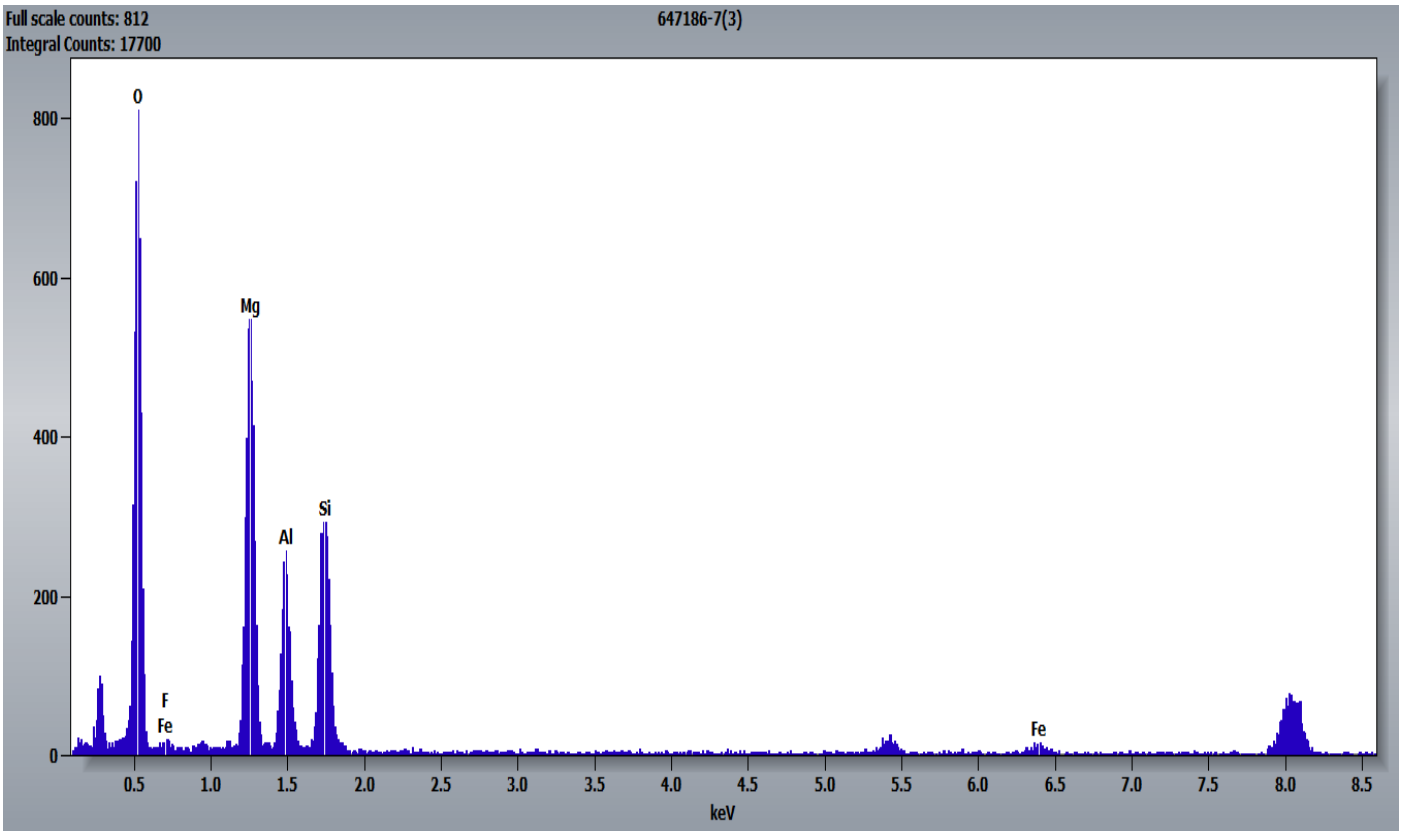
Chemistry from the Silicon Particle Pictured Above



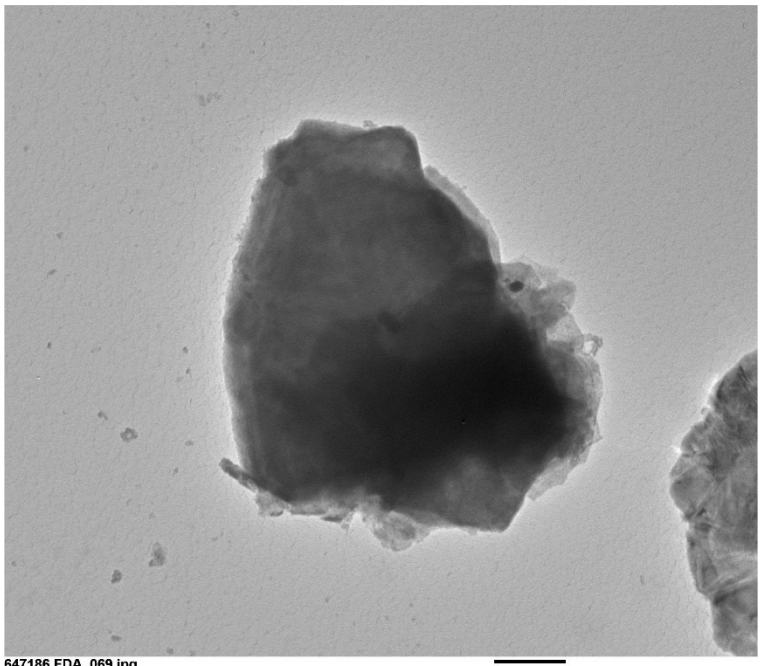
647186-7, Diffraction Pattern from Particle Containing Magnesium, Aluminum, and Silicon



Chemistry from the Particle Containing Magnesium, Aluminum, and Silicon Referenced Above



647186-7, Talc Particle

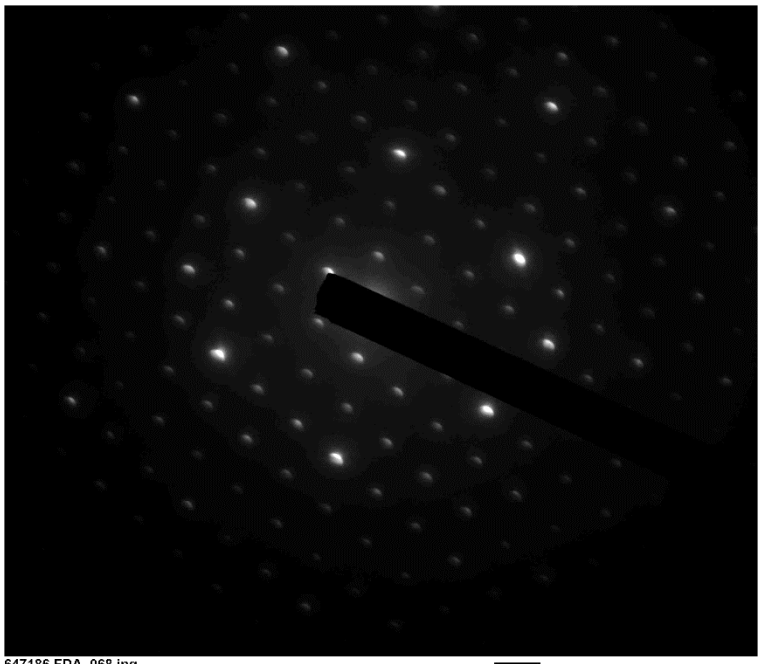


647186 FDA_069.jpg
647186-7
Talc particle

Cal: 0.002387 µm/pix
15:40 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

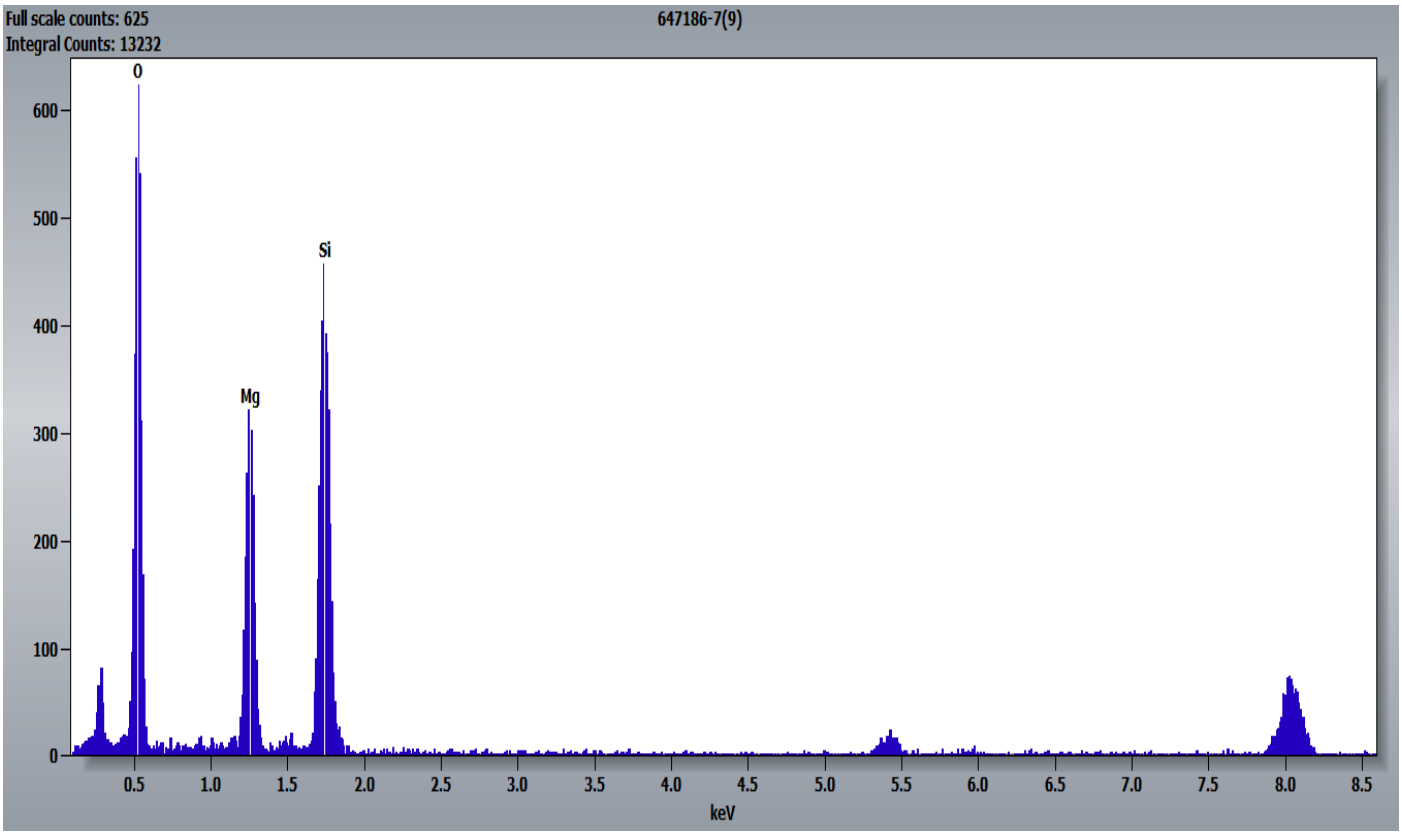


647186 FDA_068.jpg
647186-7
Talc particle

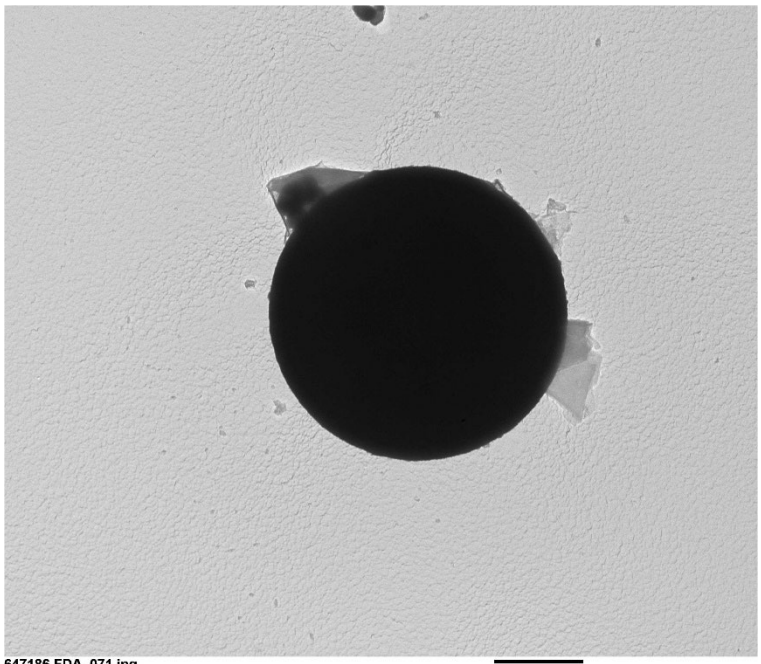
Cal: 0.000626 µm/pix
15:39 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

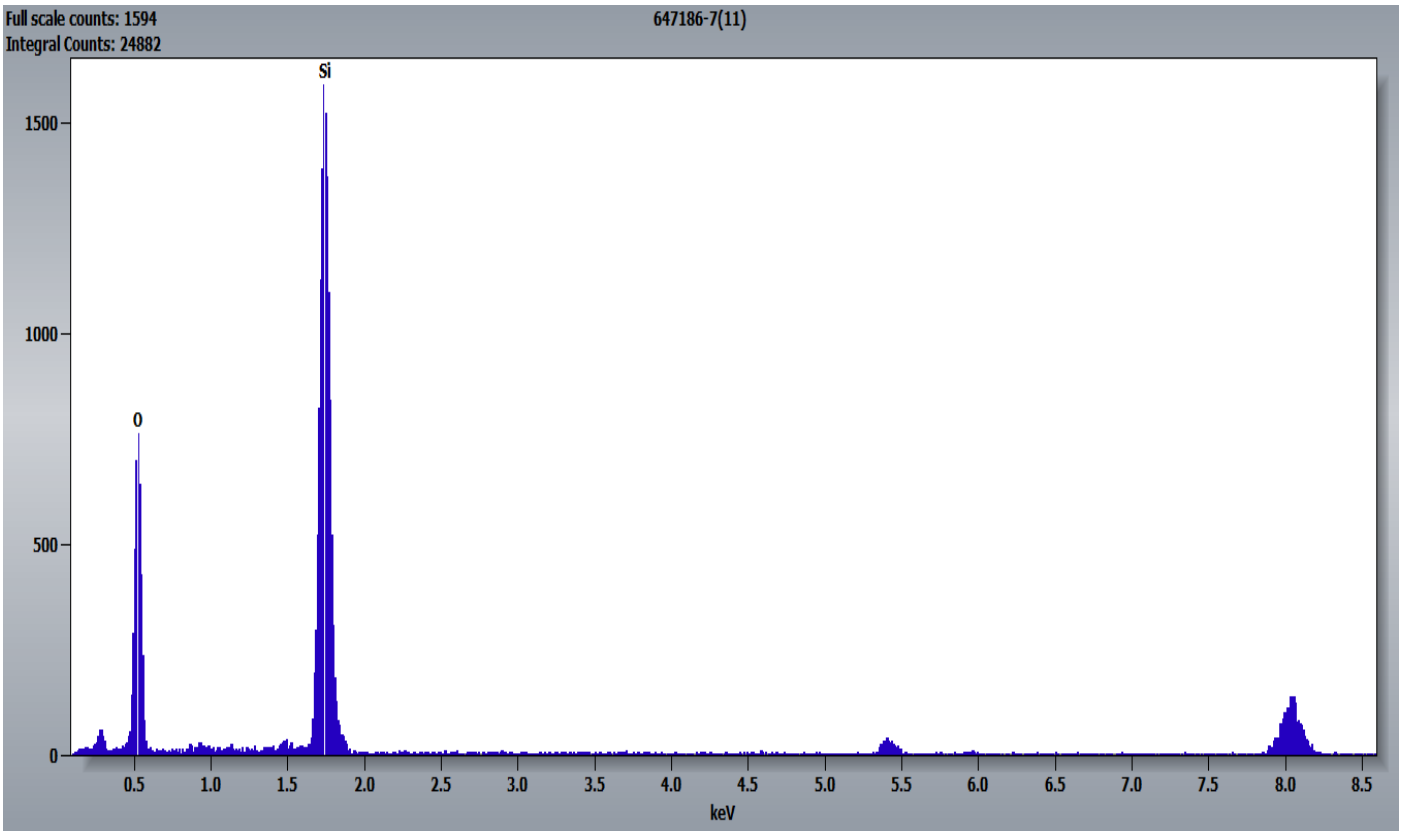
Chemistry from the Talc Particle Pictured Above



647186-7, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-8, 8A, 8B/Client Sample: 05162023-8

PLM

All three aliquots of sample 05162023-8 were analyzed by (b) (6) on August 21, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-8	No Asbestos Detected
647186-8A	No Asbestos Detected
647186-8B	No Asbestos Detected

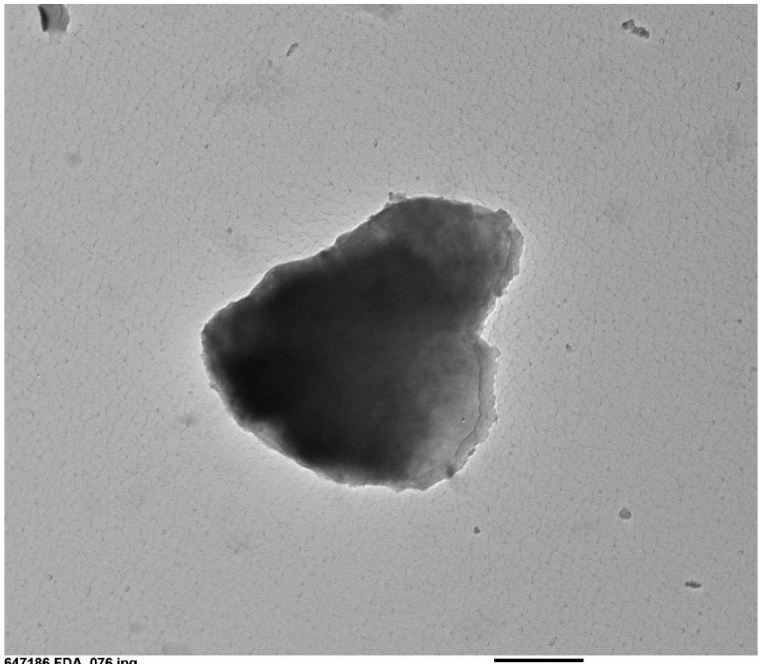
TEM

(b) (6) analyzed aliquot 8 on August 21, 2023, and aliquot 8A on August 22, 2023. (b) (6) analyzed aliquot 8B on August 22, 2023. The primary particles observed were talc, silicon, and silica spheres; talc ribbons/fibers were also observed along with a single tremolite particle. The results were calculated using the equations detailed in the *Calculations* section above.

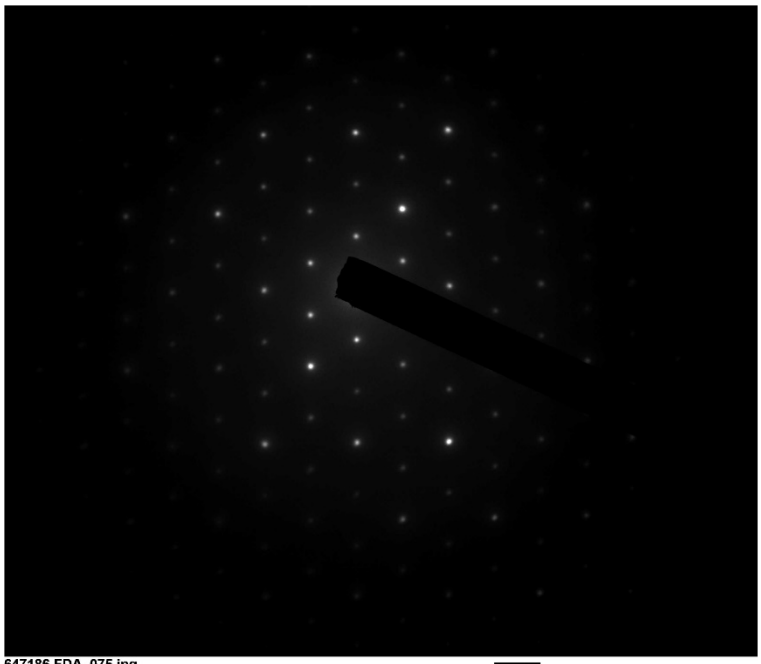
647186-8	< 0.00434%
647186-8A	No Asbestos Detected
647186-8B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-8, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

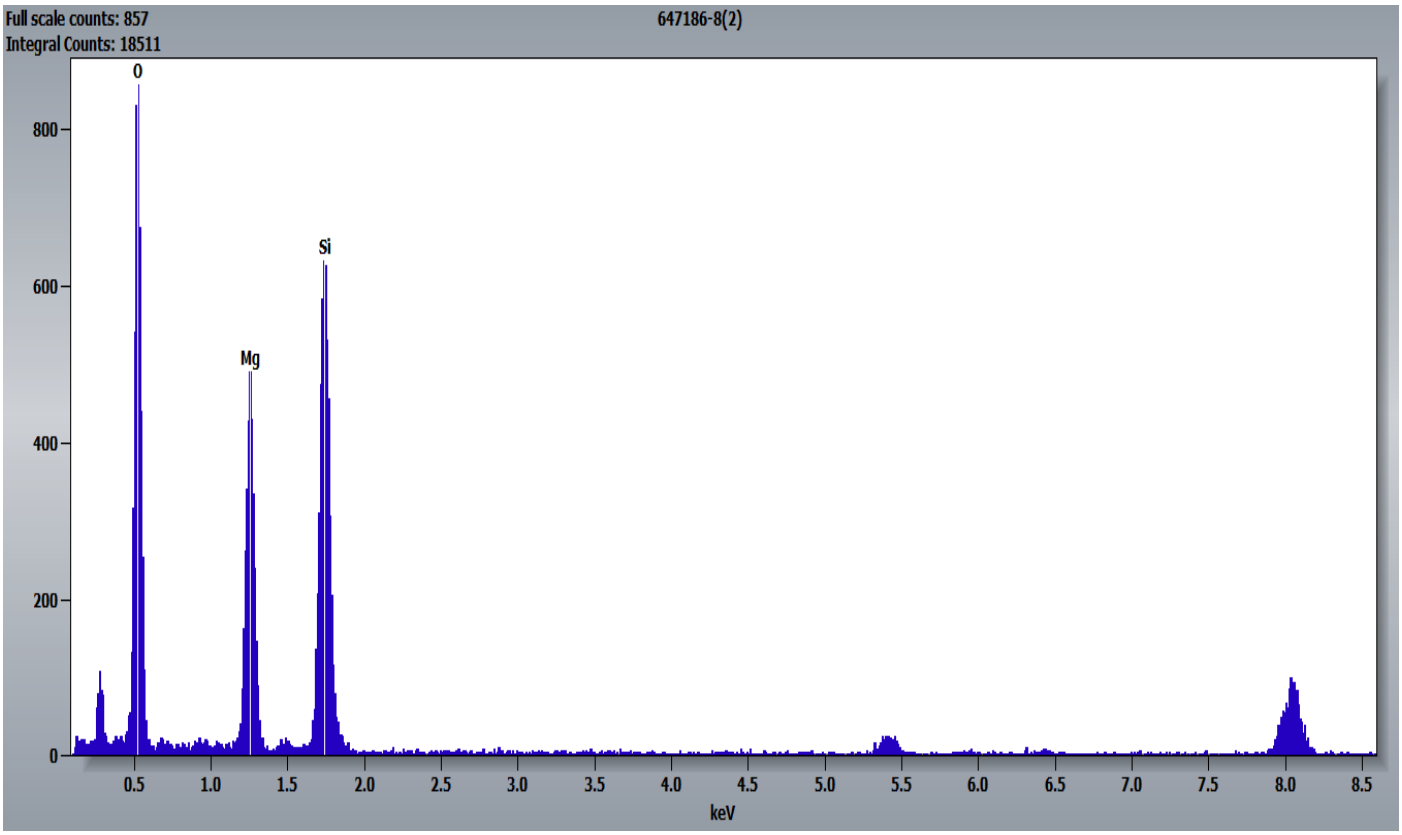


647186 FDA_075.jpg
647186-8
Talc Particle

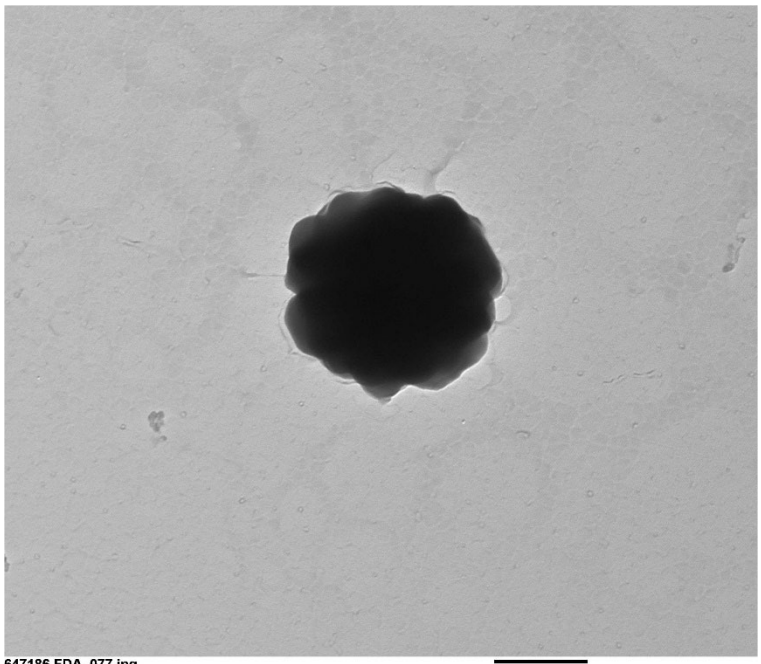
Cal: 0.002387 µm/pix
18:01 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

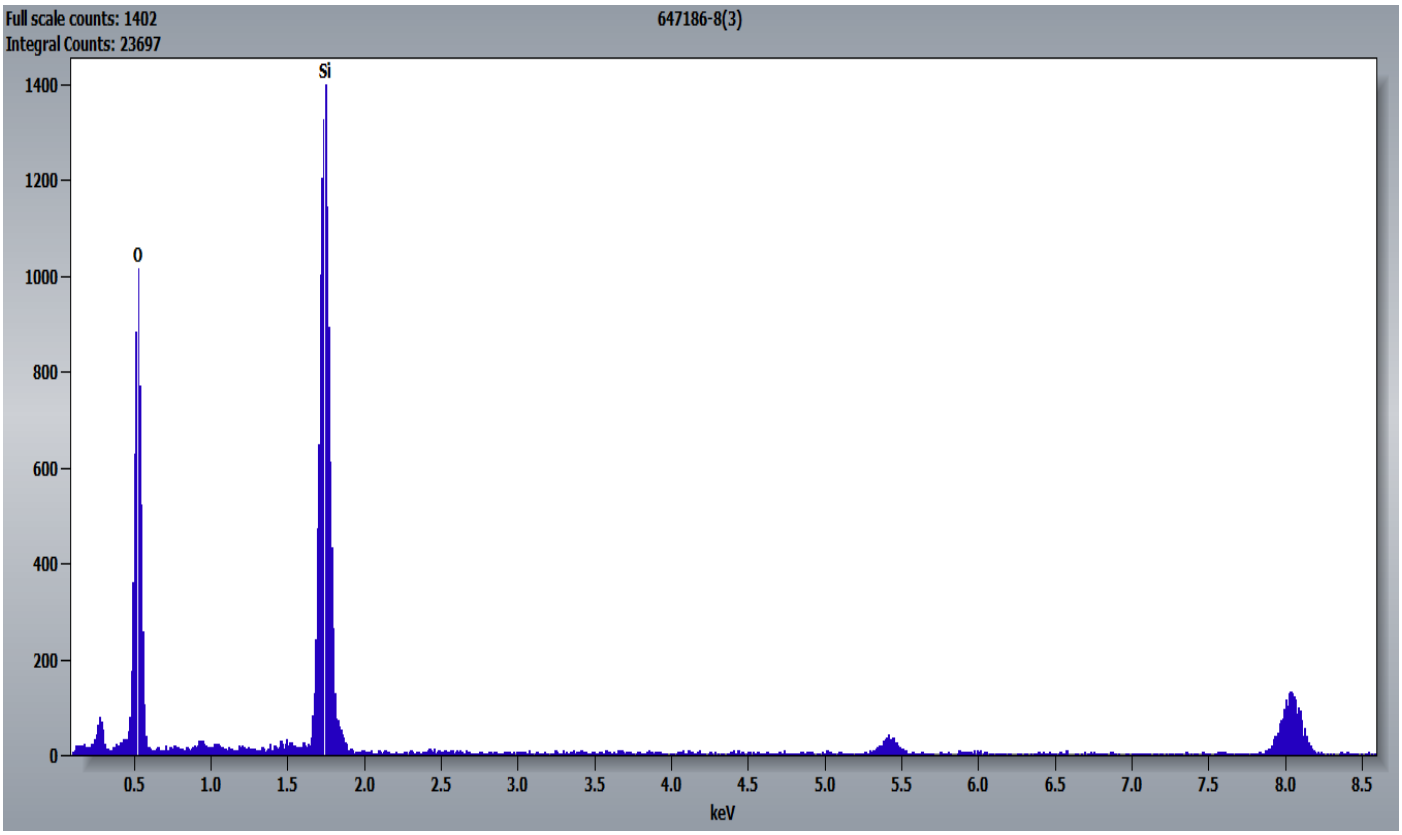
Chemistry from the Talc Particle Pictured Above



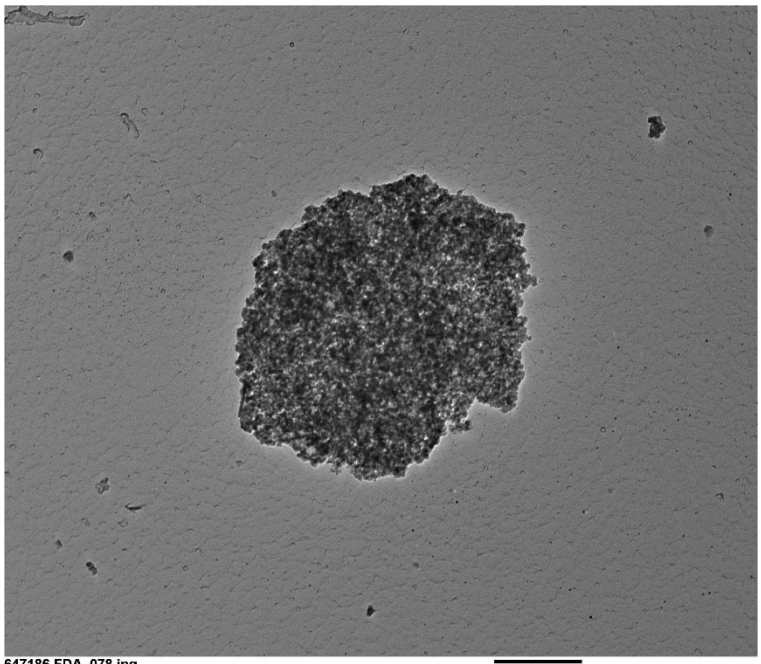
647186-8, Silicon Particle



Chemistry from the Silicon Particle Pictured Above



647186-8, Silicon Particles

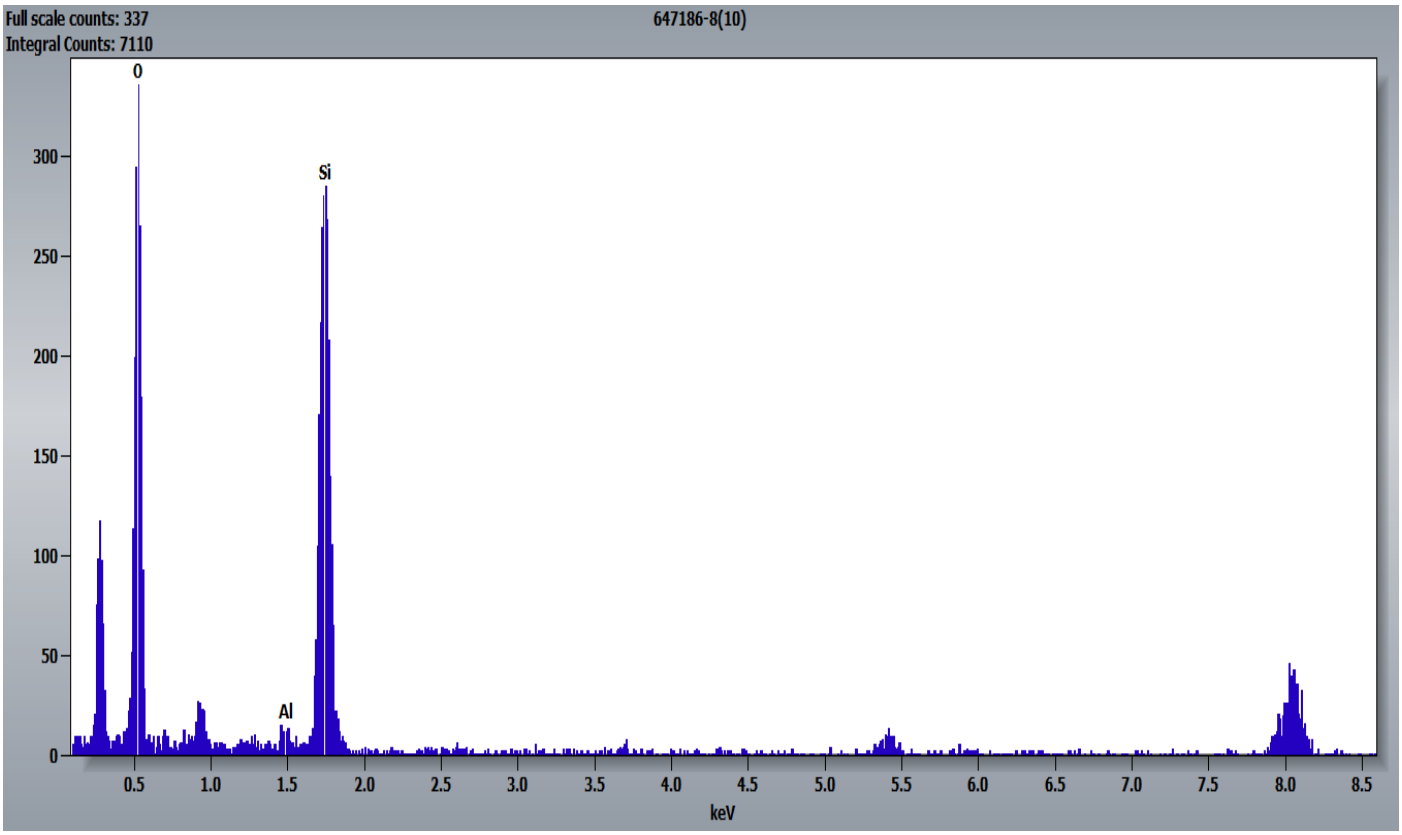


647186 FDA_078.jpg
647186-8
Si Particles

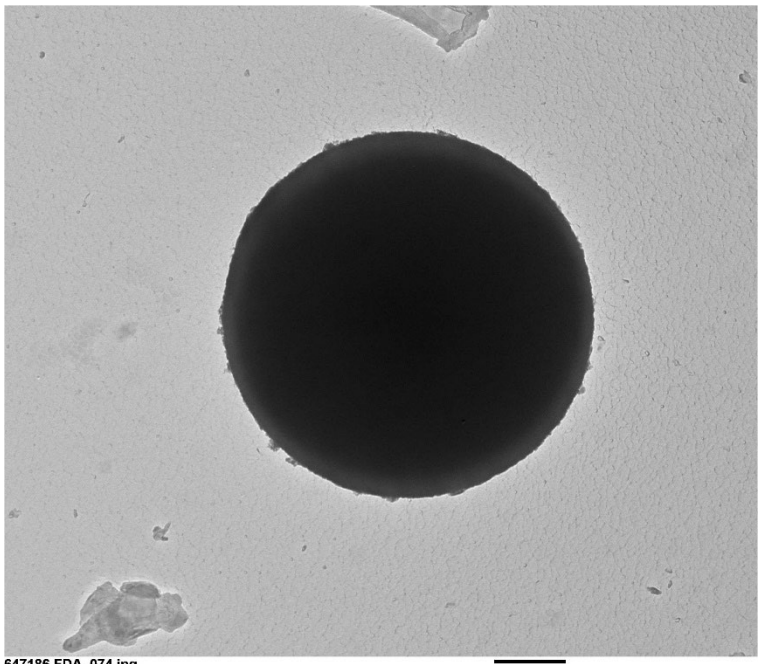
Cal: 0.001612 µm/pix
18:16 2023-08-21
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

500 nm
HV=80kV
Direct Mag: 6000 x

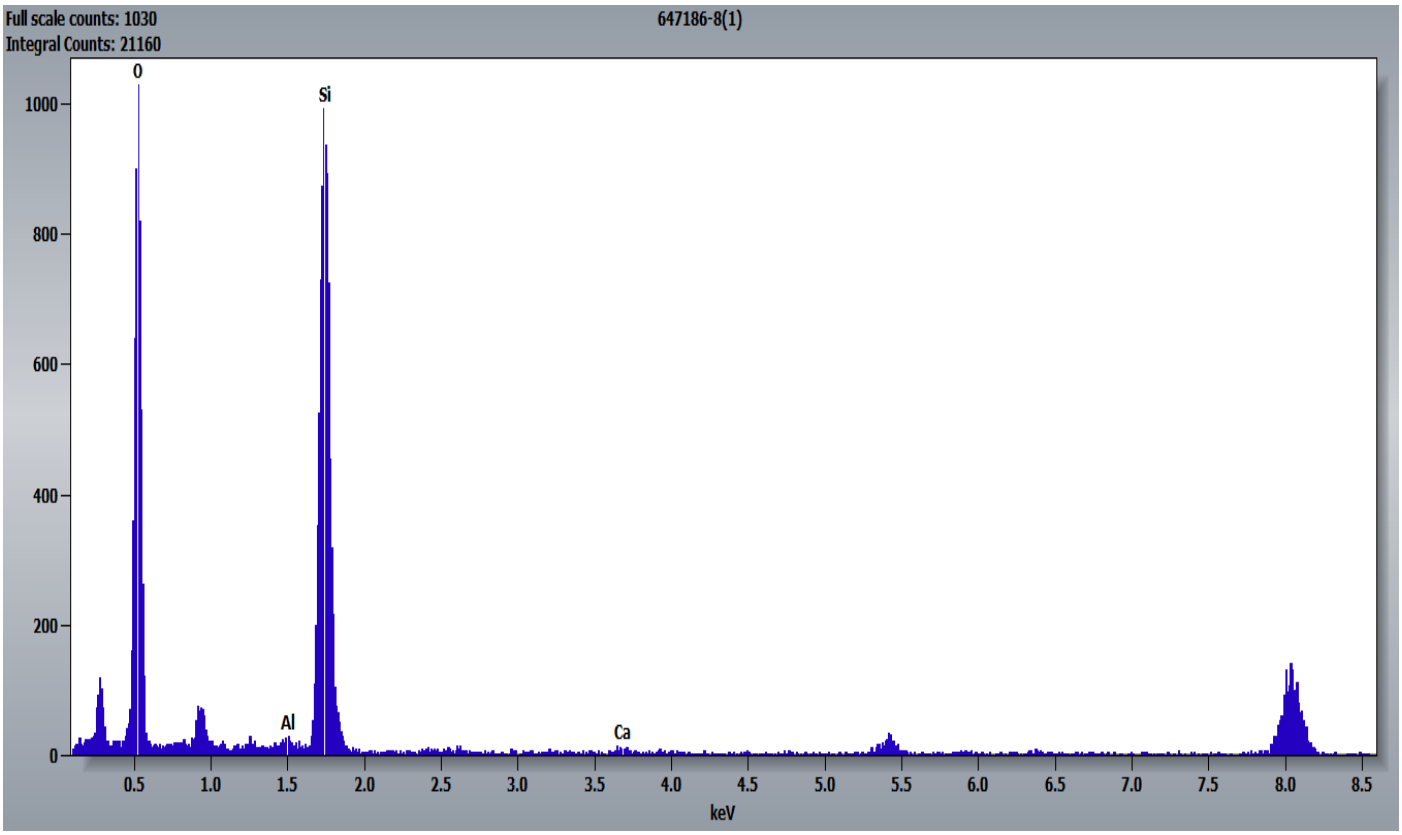
Chemistry from the Silicon Particles Pictured Above



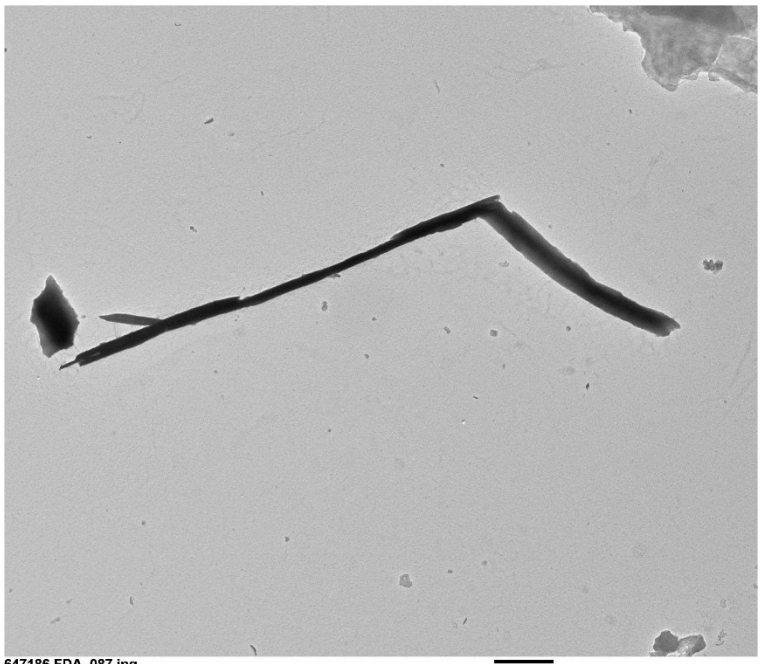
647186-8, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-8, Talc Ribbon

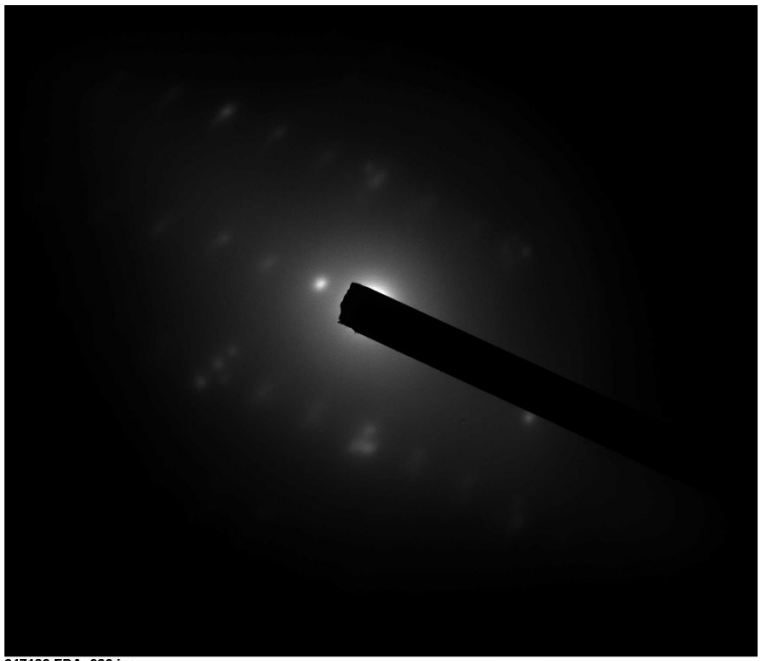


647186 FDA_087.jpg
647186-8
Talc Ribbon

Cal: 0.004774 µm/pix
18:43 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2000 x

Diffraction Pattern from the Talc Ribbon Pictured Above

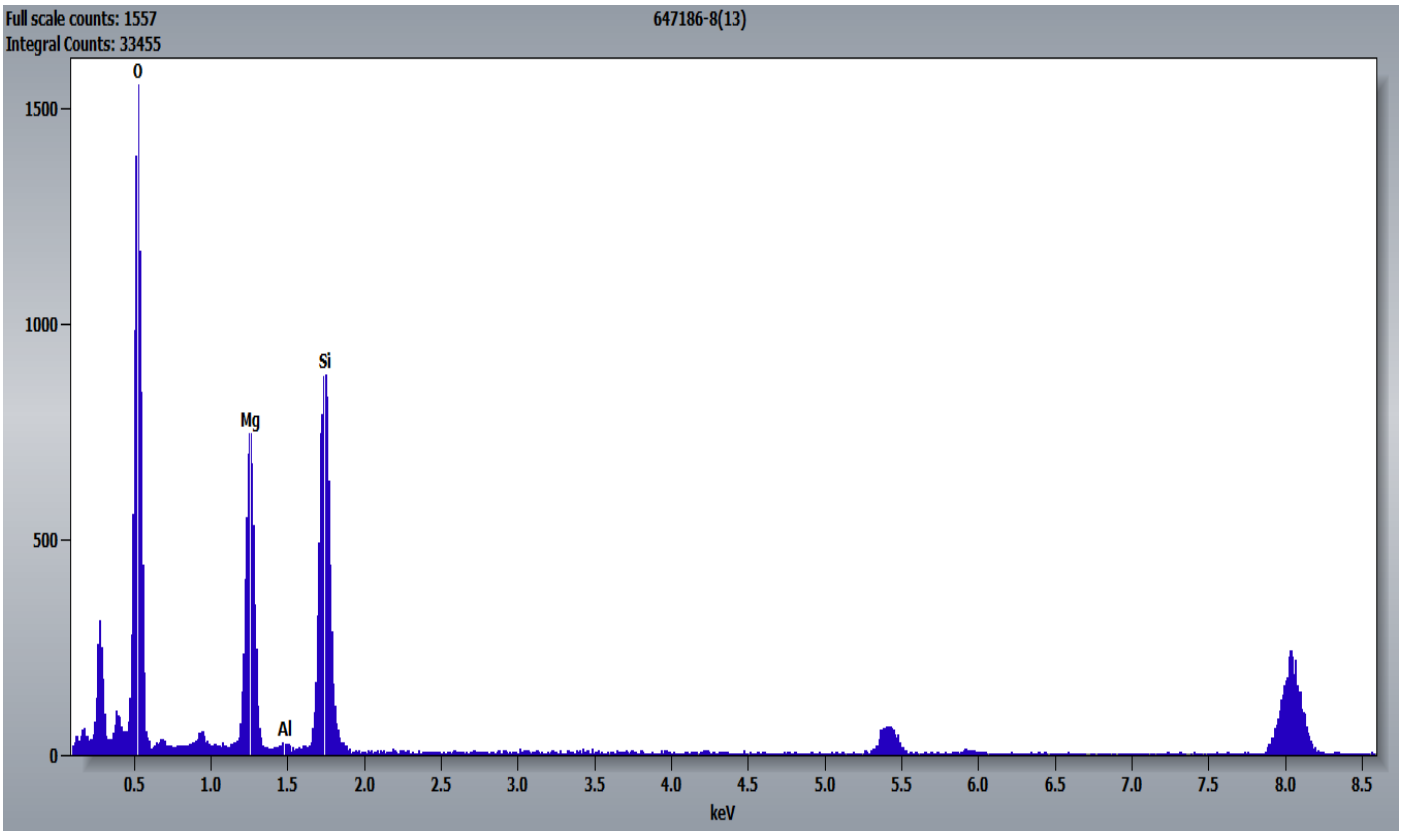


647186 FDA_086.jpg
647186-8
Talc Ribbon

Cal: 0.002387 µm/pix
18:42 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



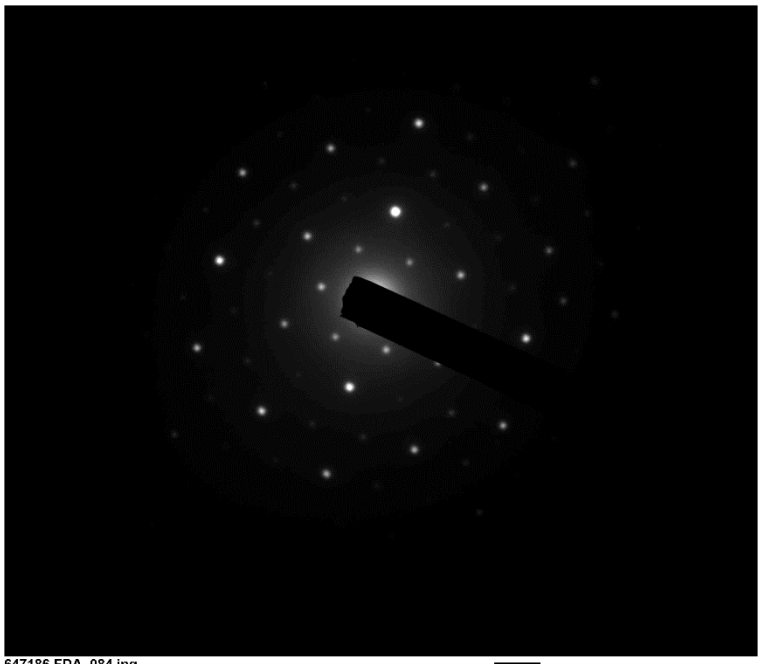
647186-8, Talc Fiber

647186 FDA_085.jpg
647186-8
Talc Fiber

Cal: 0.002387 µm/pix
18:39 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Talc Fiber Pictured Above

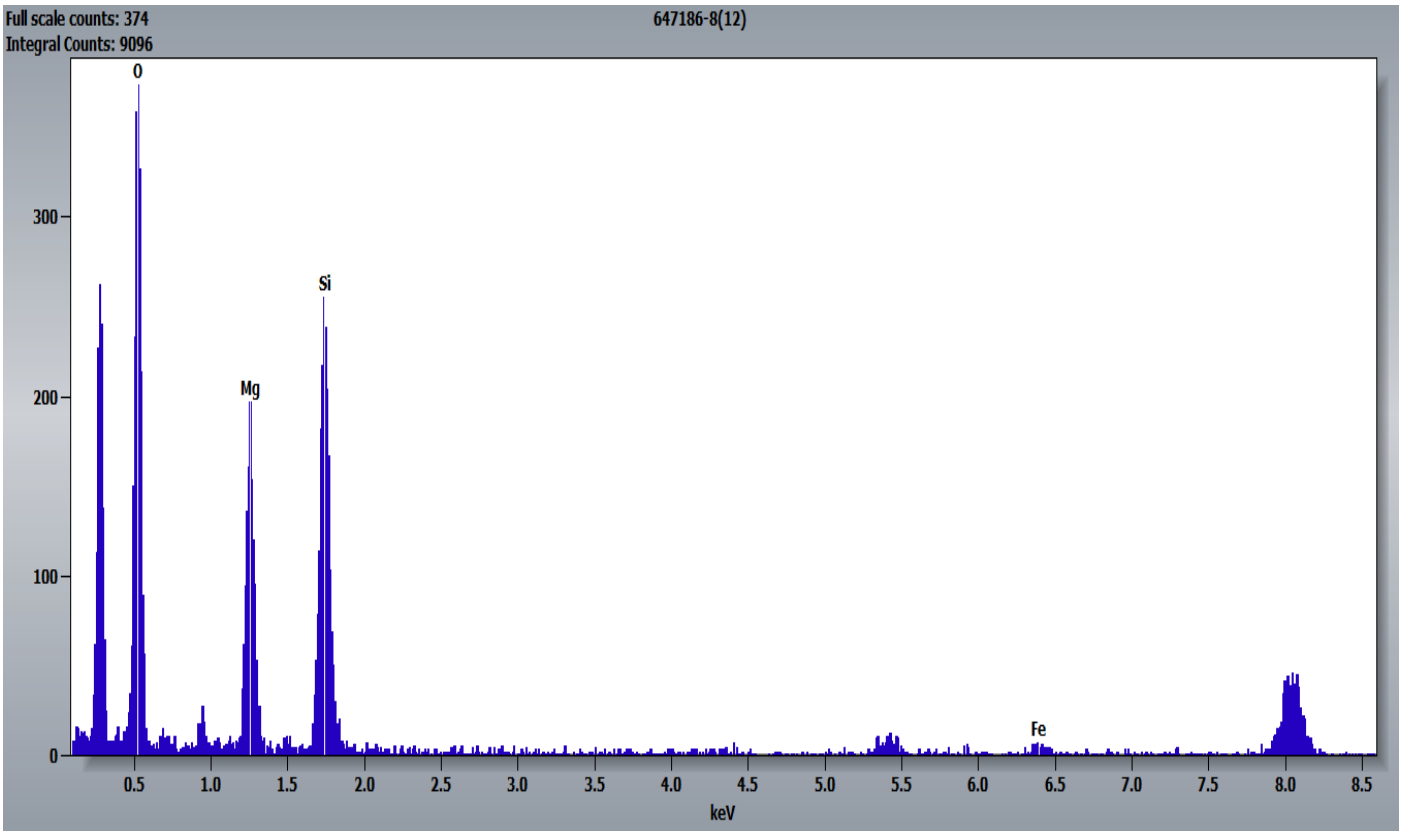


647186 FDA_084.jpg
647186-8
Talc Fiber

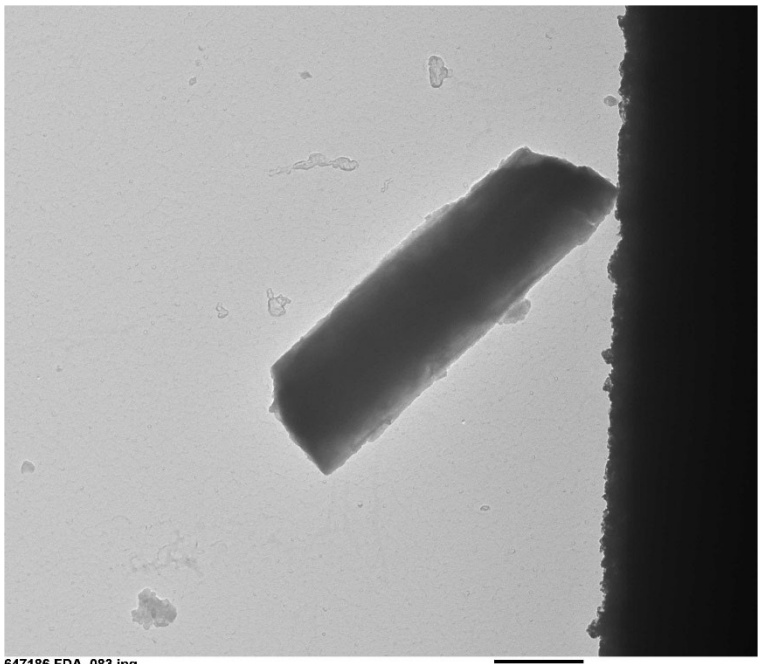
Cal: 0.001905 µm/pix
18:38 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Fiber Pictured Above



647186-8, Tremolite Particle

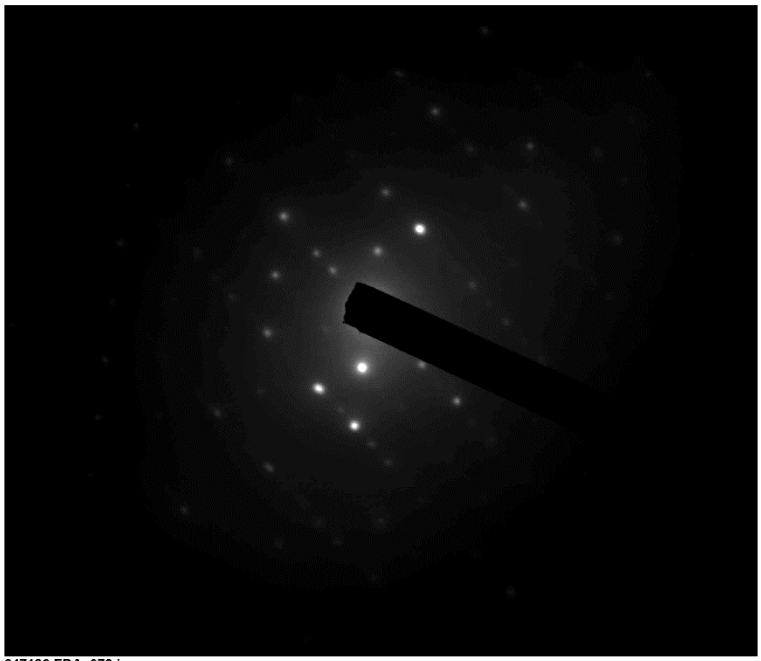


647186 FDA_083.jpg
647186-8
Tremolite

Cal: 0.001905 µm/pix
18:32 2023-08-21
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 5000 x

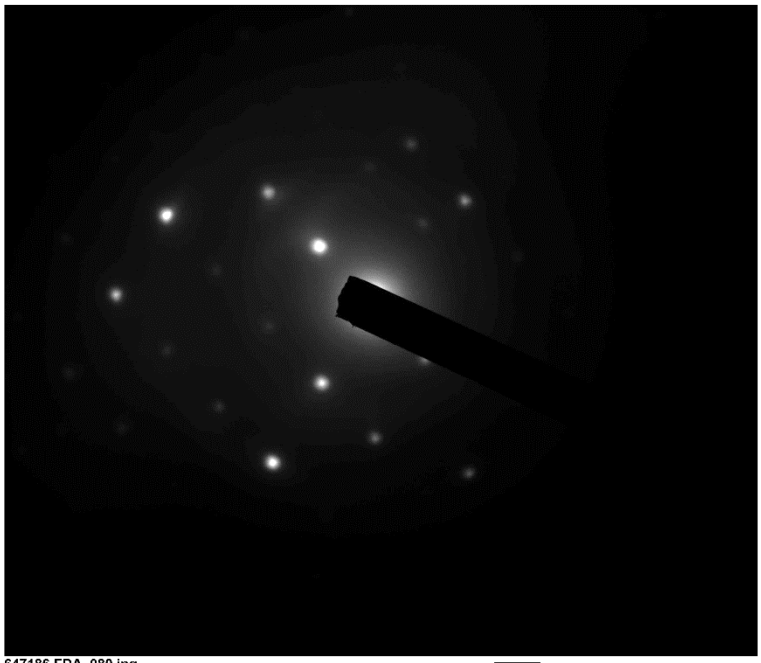
Diffraction Patterns from the Tremolite Particle Pictured Above



647186 FDA_079.jpg
647186-8
Tremolite

Cal: 0.001612 µm/pix
18:26 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

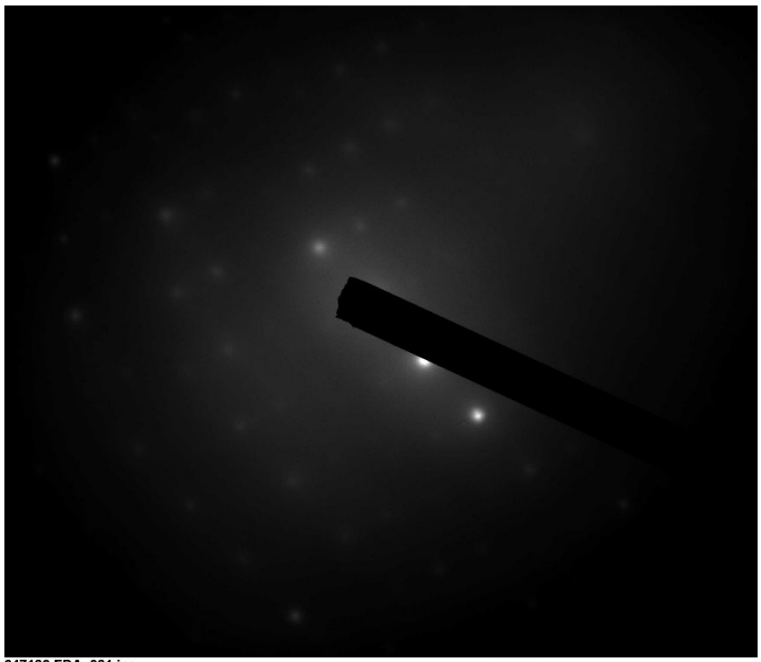
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m



647186 FDA_080.jpg
647186-8
Tremolite

Cal: 0.001612 µm/pix
18:30 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

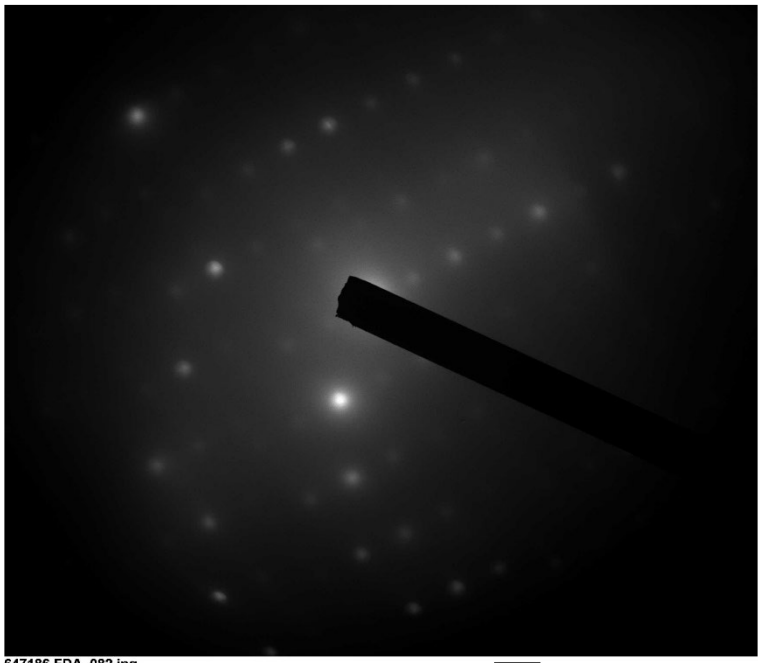
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m



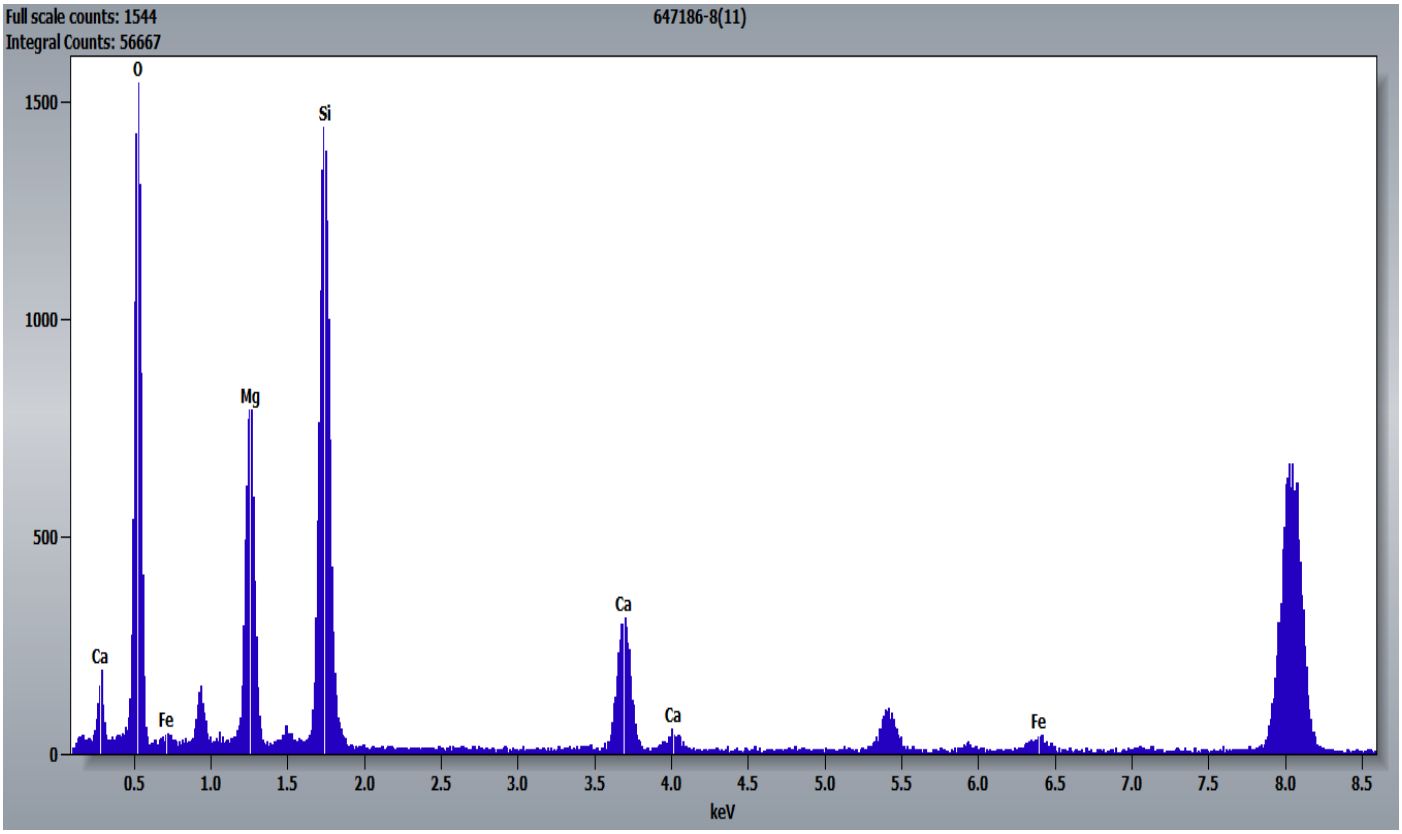
647186 FDA_081.jpg
647186-8
Tremolite

Cal: 0.001612 µm/pix
18:30 2023-08-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m



Chemistry from the Tremolite Particle Pictured Above



647186-9, 9A, 9B/Client Sample: 05162023-9

PLM

All three aliquots of sample 05162023-9 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-9	No Asbestos Detected
647186-9A	No Asbestos Detected
647186-9B	No Asbestos Detected

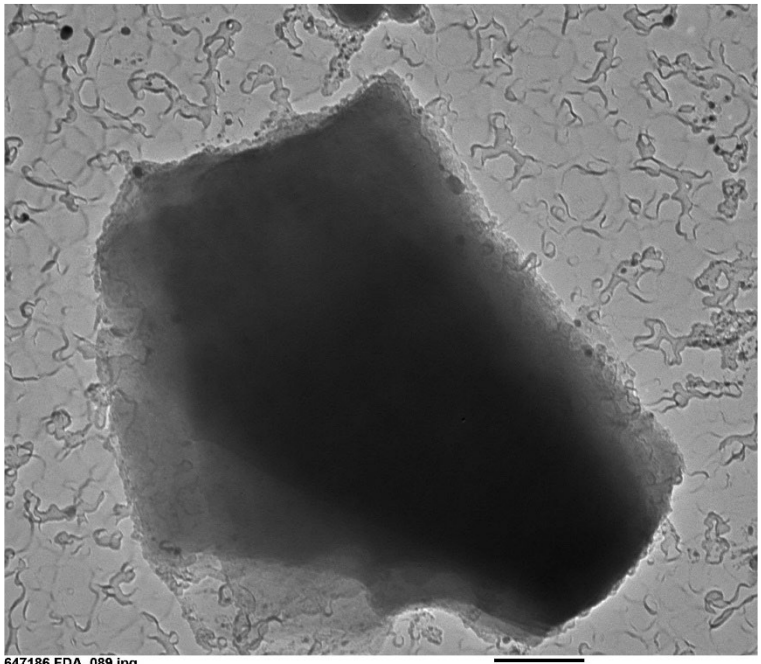
TEM

(b) (6) analyzed aliquot 9 on August 23, 2023. (b) (6) analyzed aliquots 9A and 9B on August 25, 2023. The primary particles observed were talc and talc ribbons/fibers; silica spheres and iron particles were also observed along with elongated iron particles. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

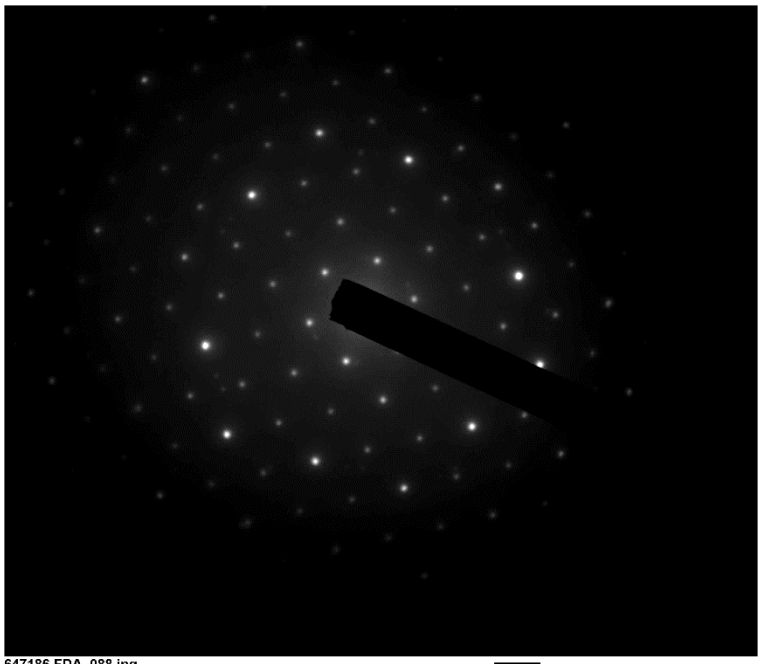
647186-9	No Asbestos Detected
647186-9A	No Asbestos Detected
647186-9B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-9, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

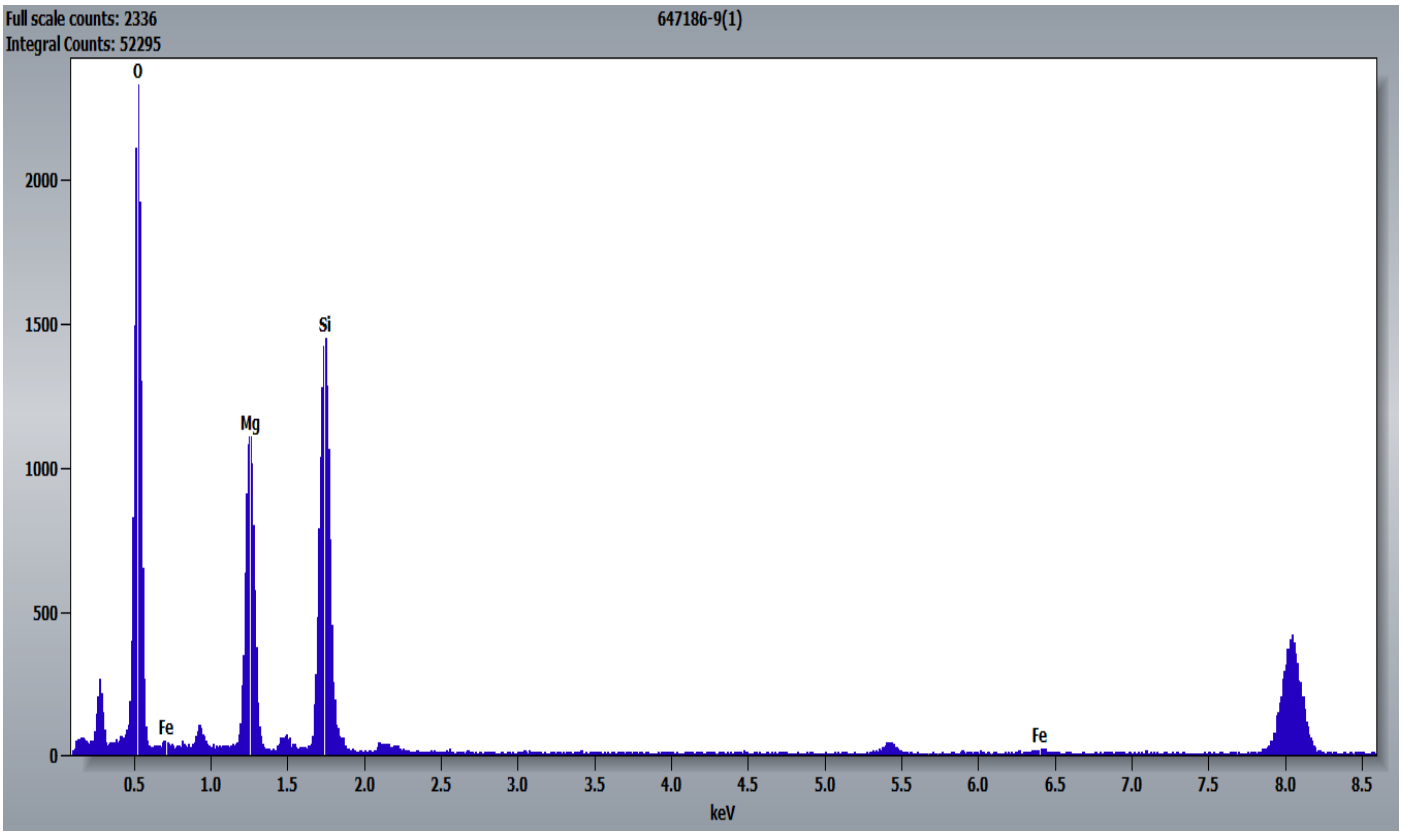


647186 FDA_088.jpg
647186-9
Talc
FDA

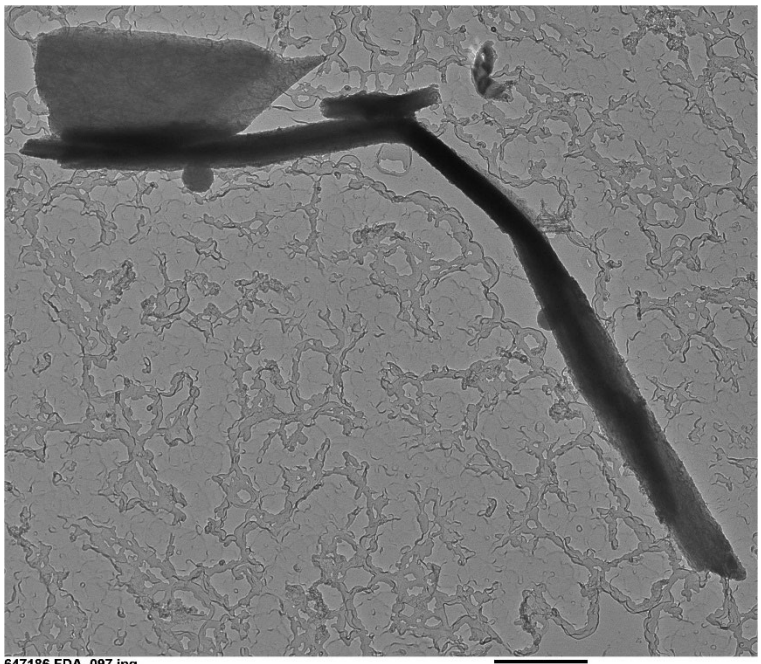
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

11:00 2023-08-23
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

Chemistry from the Talc Particle Pictured Above



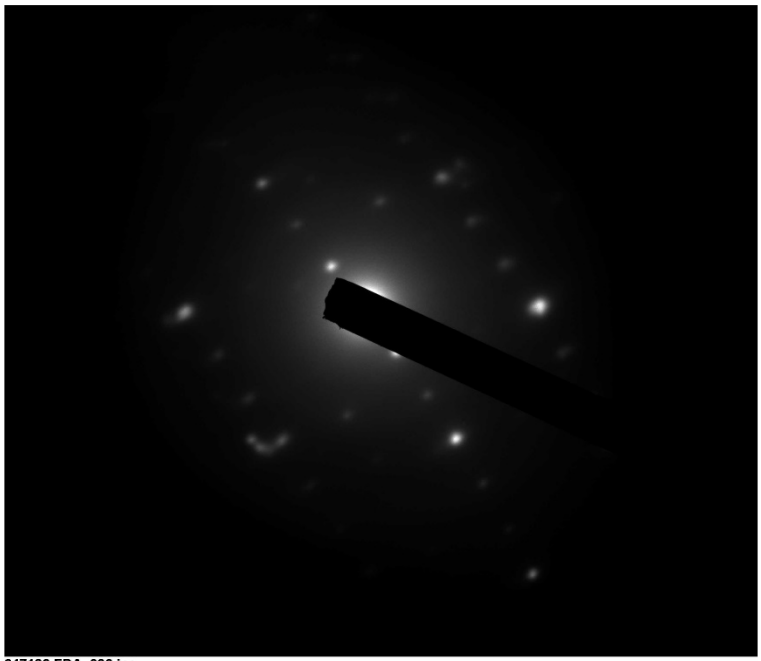
647186-9, Talc Ribbon



647186 FDA_097.jpg
647186-9
Talc ribbon
FDA
Cal: 0.001209 µm/pix
11:44 2023-08-23
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=80kV
Direct Mag: 8000 x

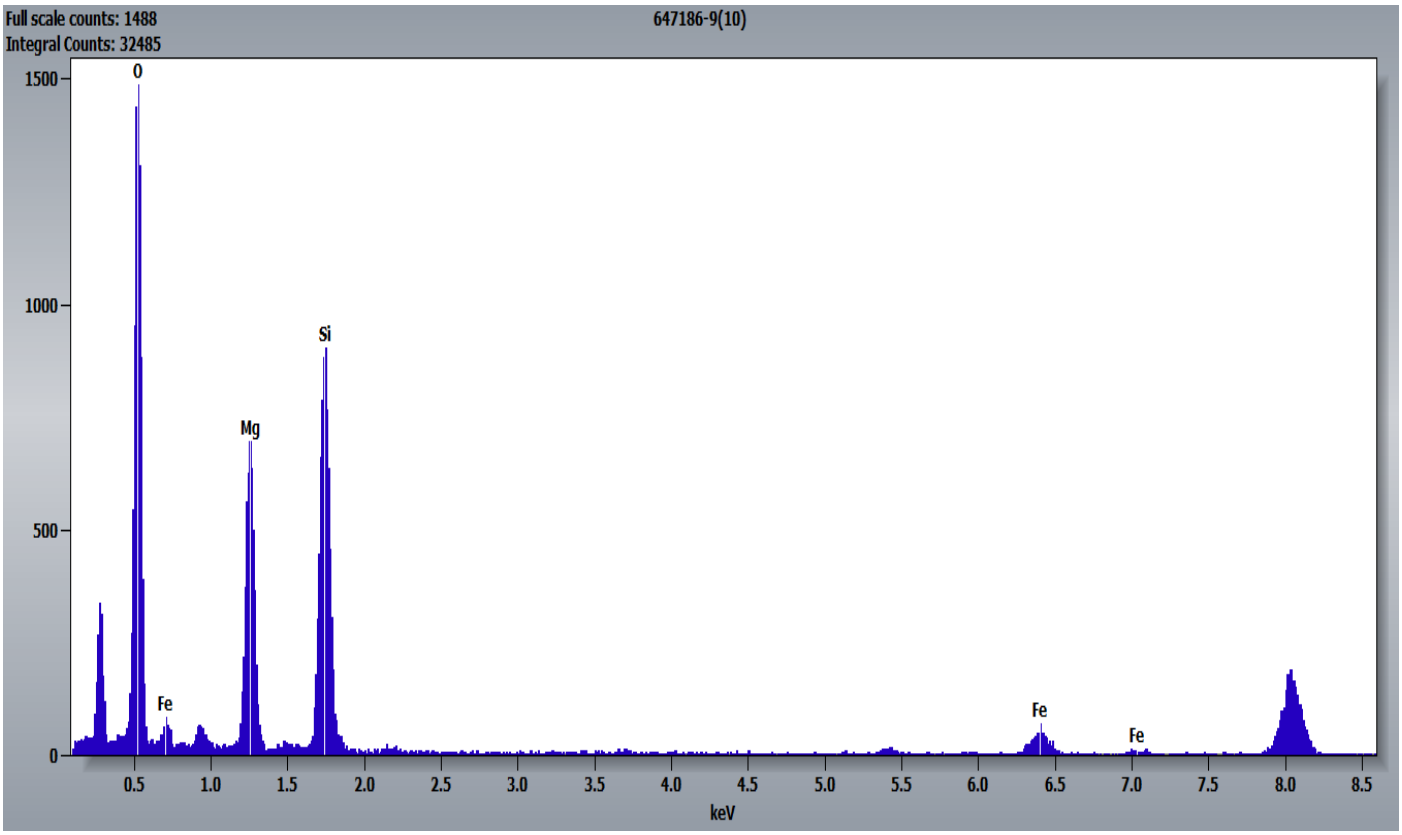
Diffraction Pattern from the Talc Ribbon Pictured Above



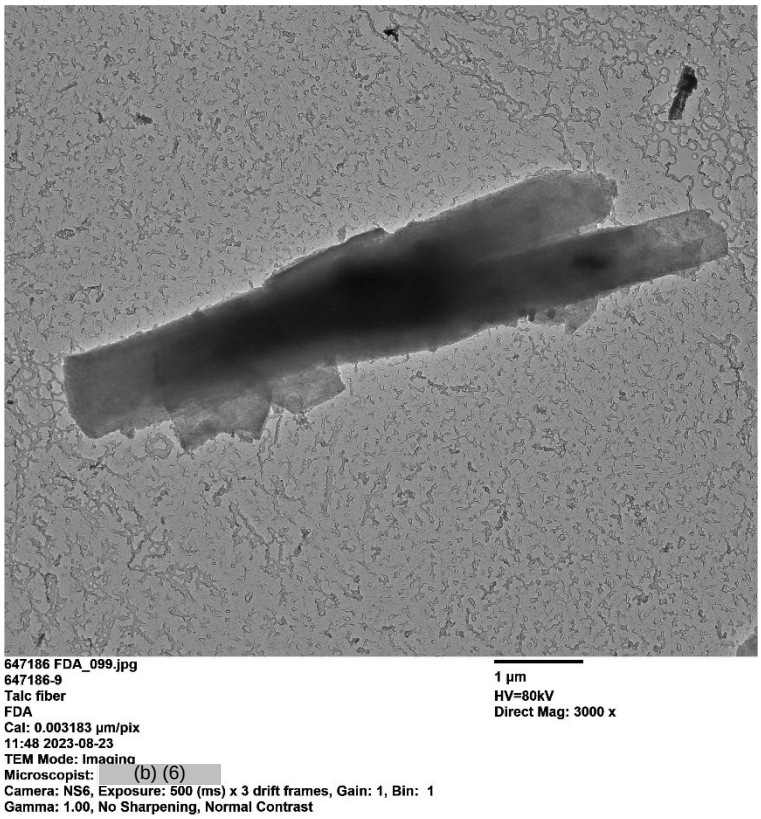
647186 FDA_096.jpg
647186-9
Talc ribbon
FDA
Cal: 0.000477 µm/pix
11:41 2023-08-23
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

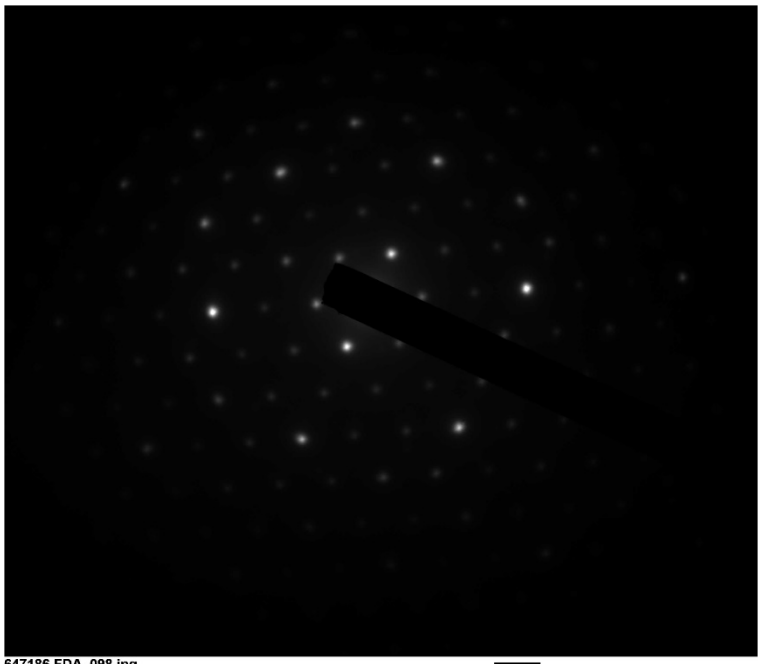
Chemistry from the Talc Ribbon Pictured Above



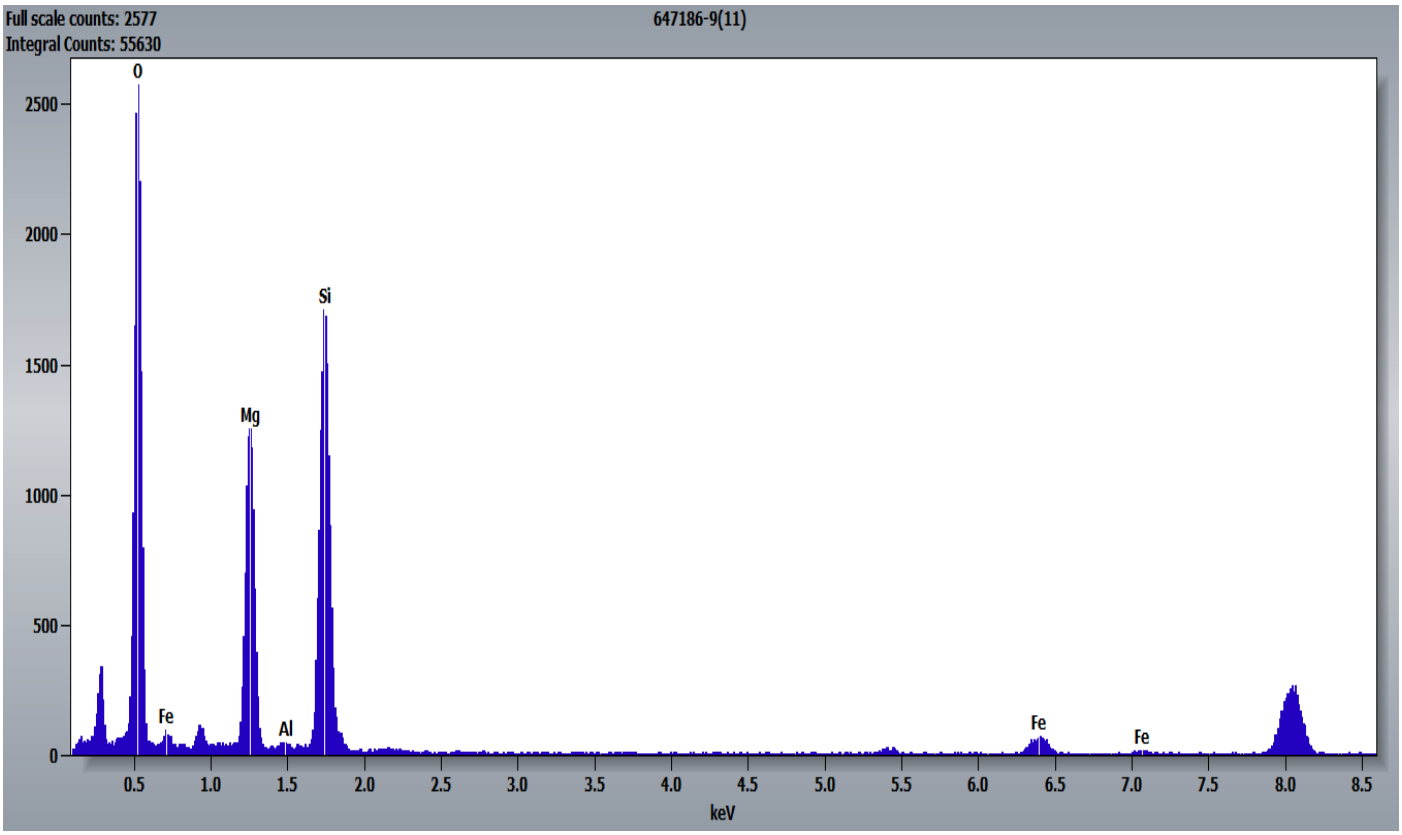
647186-9, Elongated Talc Particle



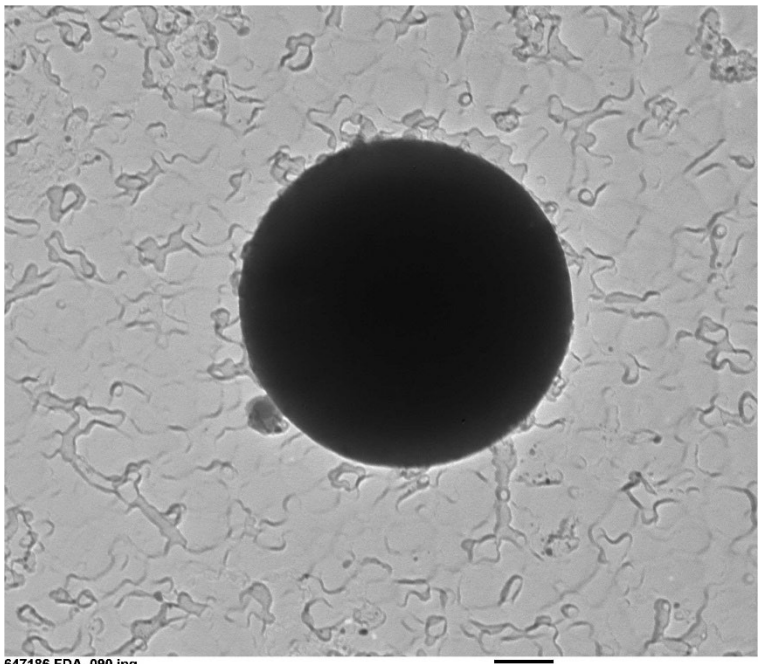
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



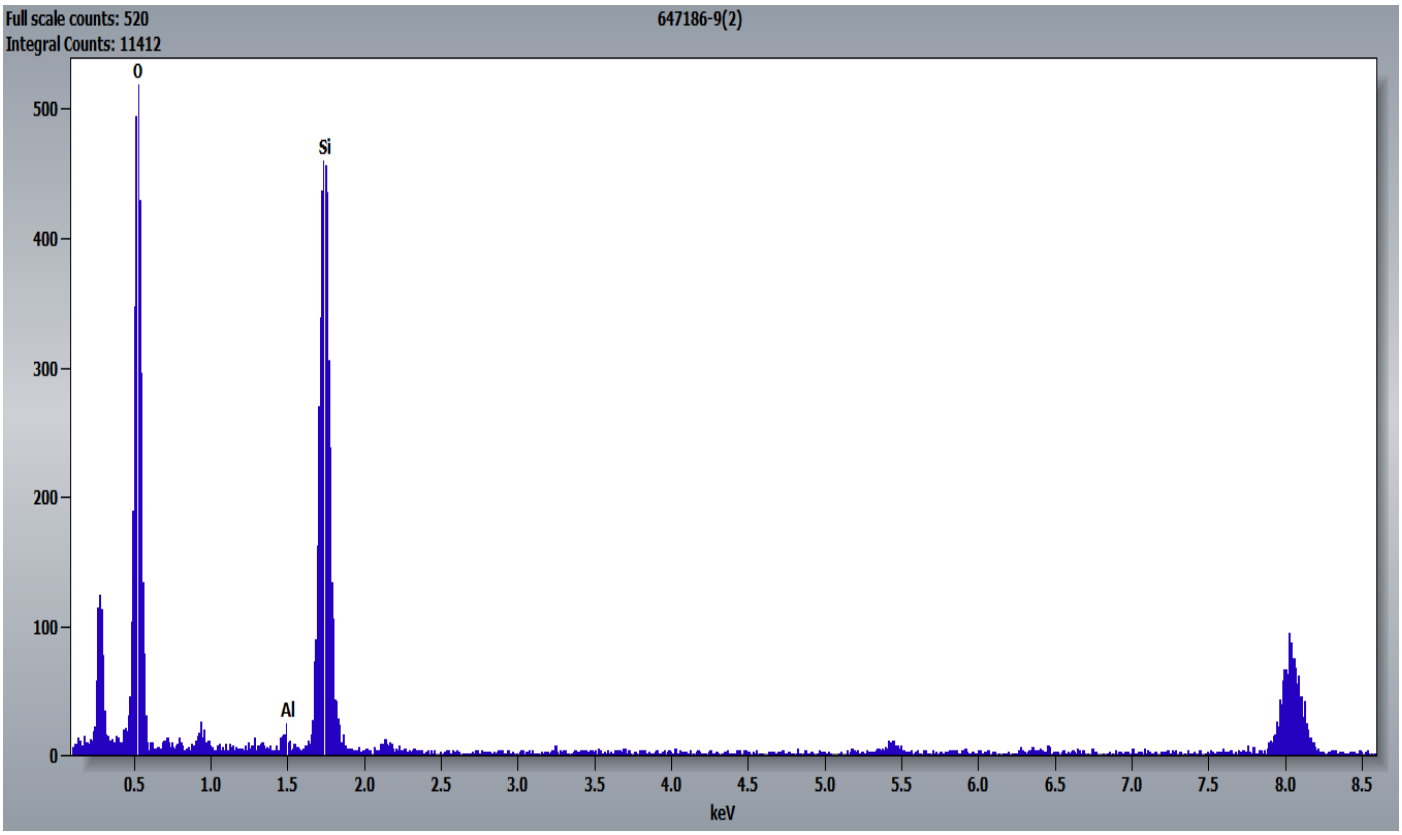
Chemistry from the Elongated Talc Particle Pictured Above



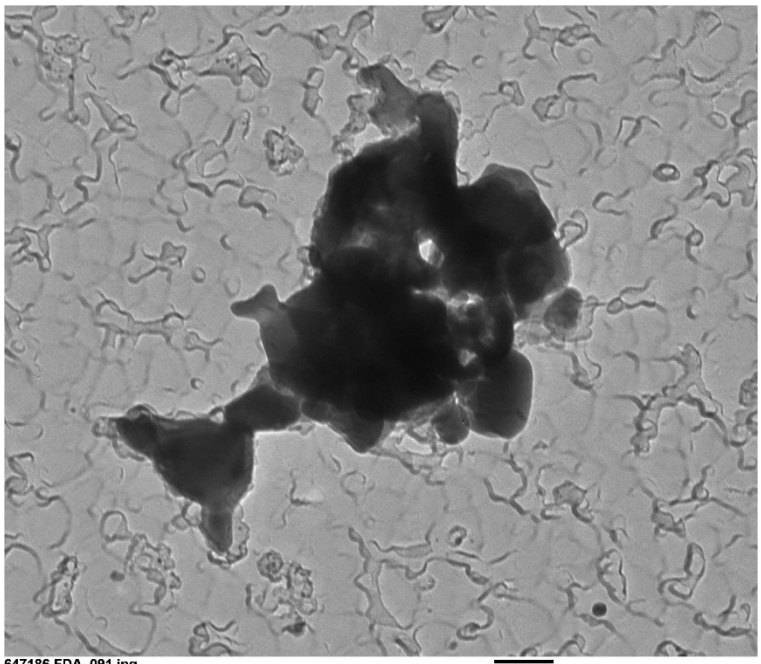
647186-9, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-9, Iron Particles



647186 FDA_091.jpg
647186-9
Fe particles
FDA
Cal: 0.000477 µm/pix
11:09 2023-08-23
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

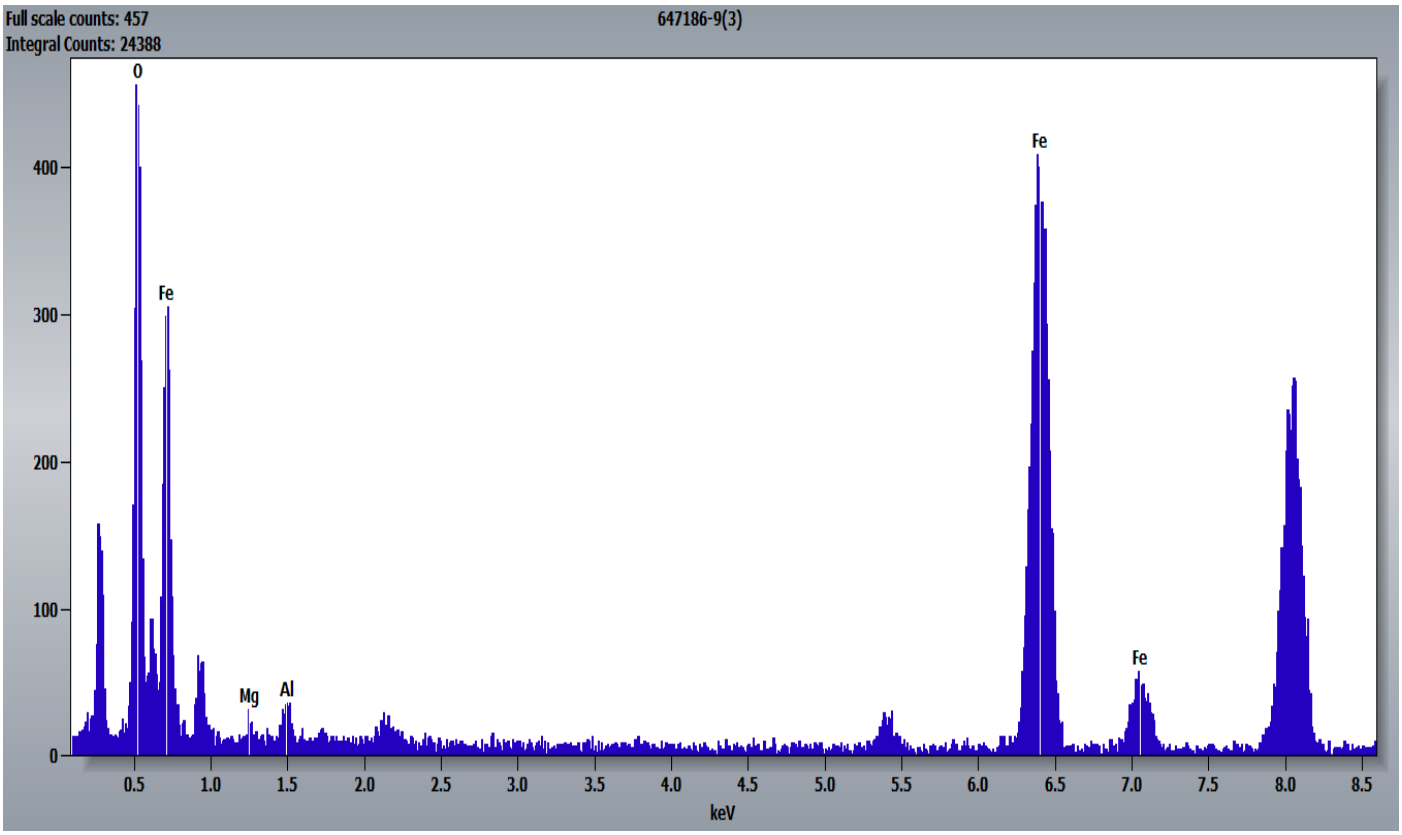
100 nm
HV=80kV
Direct Mag: 20000 x

Diffraction Pattern from the Iron Particles Pictured Above

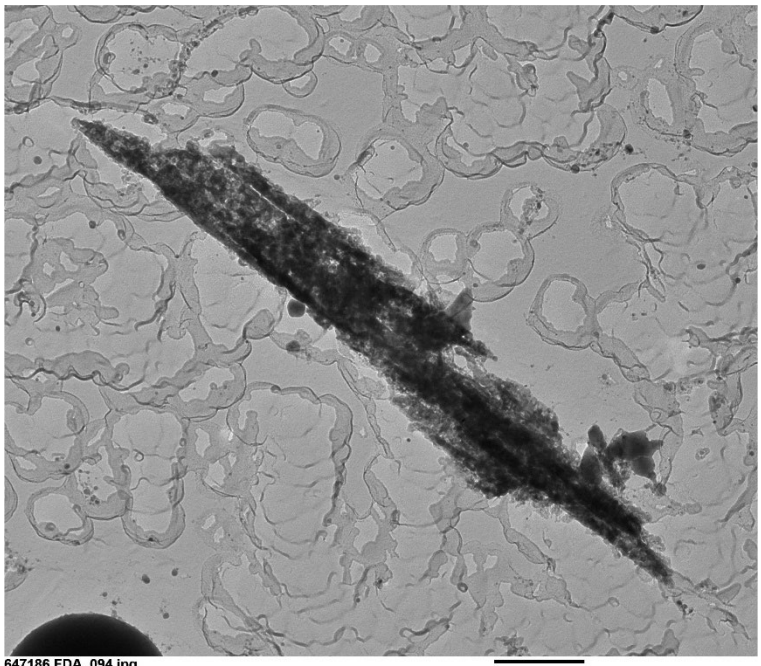
647186 FDA_092.jpg
647186-9
Fe particles
FDA
Cal: 0.000477 µm/pix
11:10 2023-08-23
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Iron Particles Pictured Above



647186-9, Elongated Iron Particle



647186 FDA_094.jpg
647186-9
Fe fiber
FDA
Cal: 0.000626 µm/pix
11:17 2023-08-23
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

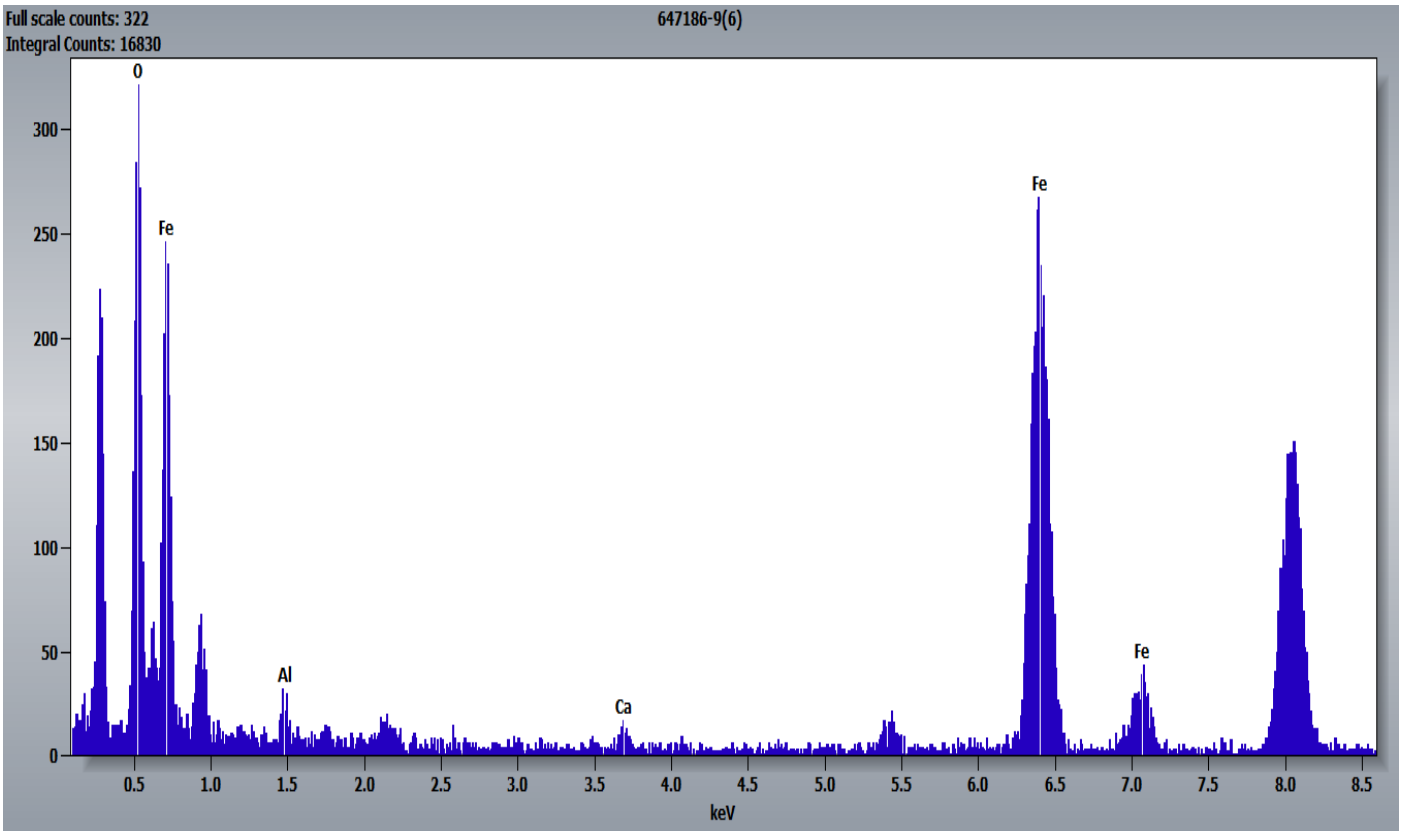
200 nm
HV=80kV
Direct Mag: 15000 x

Diffraction Pattern from the Elongated Iron Particle Pictured Above

647186 FDA_093.jpg
647186-9
Fe fiber
FDA
Cal: 0.000477 µm/pix
11:14 2023-08-23
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Iron Particle Pictured Above



647186-10, 10A, 10B/Client Sample: 05162023-10

PLM

All three aliquots of sample 05162023-10 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-10	No Asbestos Detected
647186-10A	No Asbestos Detected
647186-10B	No Asbestos Detected

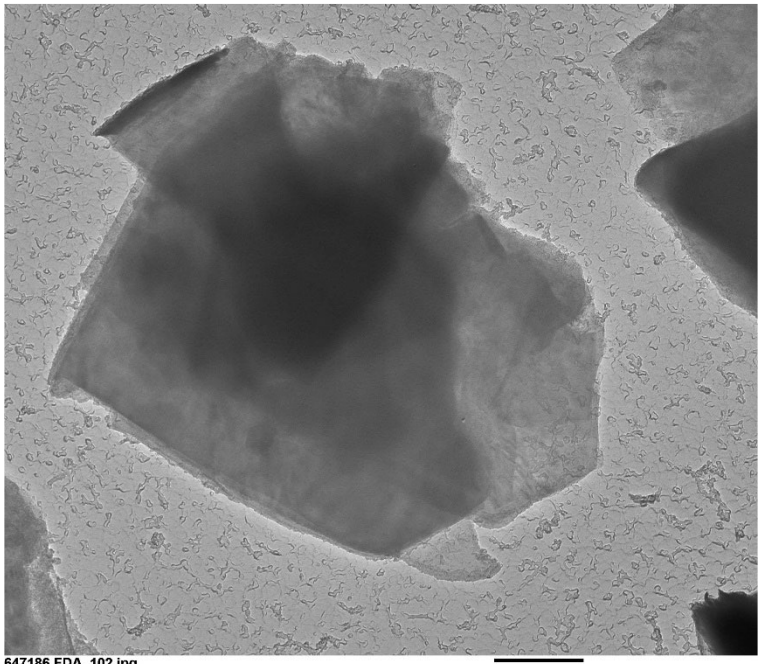
TEM

(b) (6) analyzed aliquot 10 on August 24, 2023. (b) (6) analyzed aliquots 10A and 10B on August 25, 2023. The primary particles observed were talc and talc ribbons/fibers; iron and titanium particles were also observed along with silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

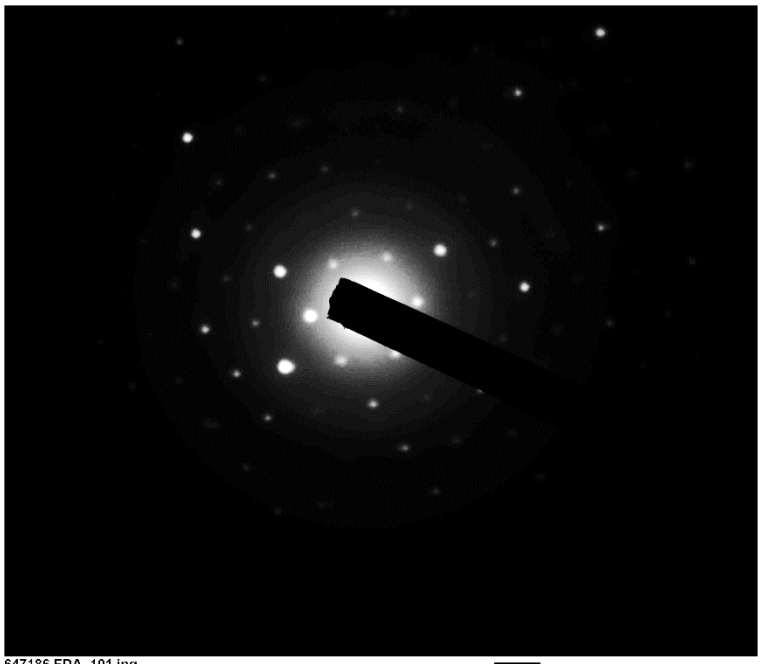
647186-10	No Asbestos Detected
647186-10A	No Asbestos Detected
647186-10B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

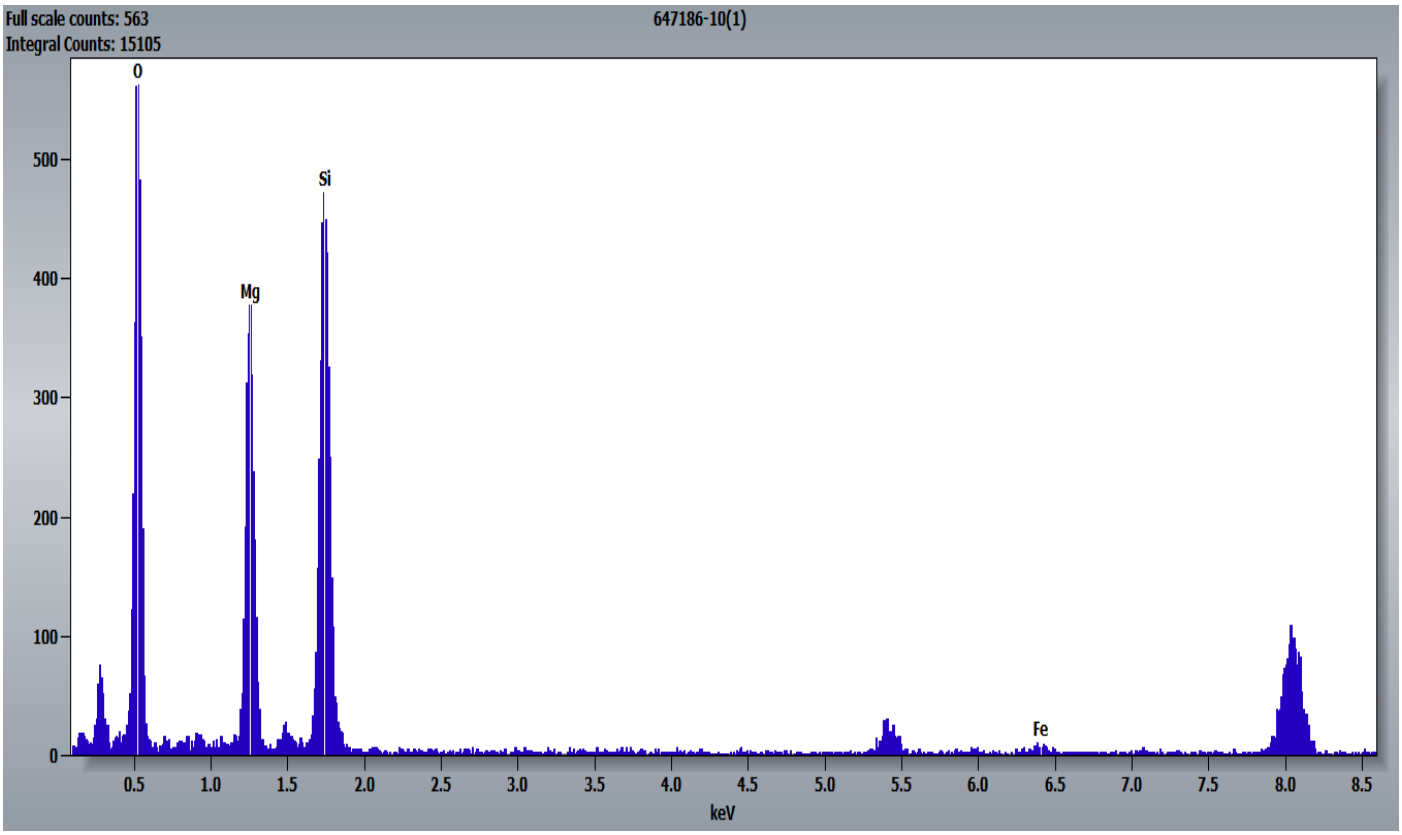
647186-10, Talc Particle



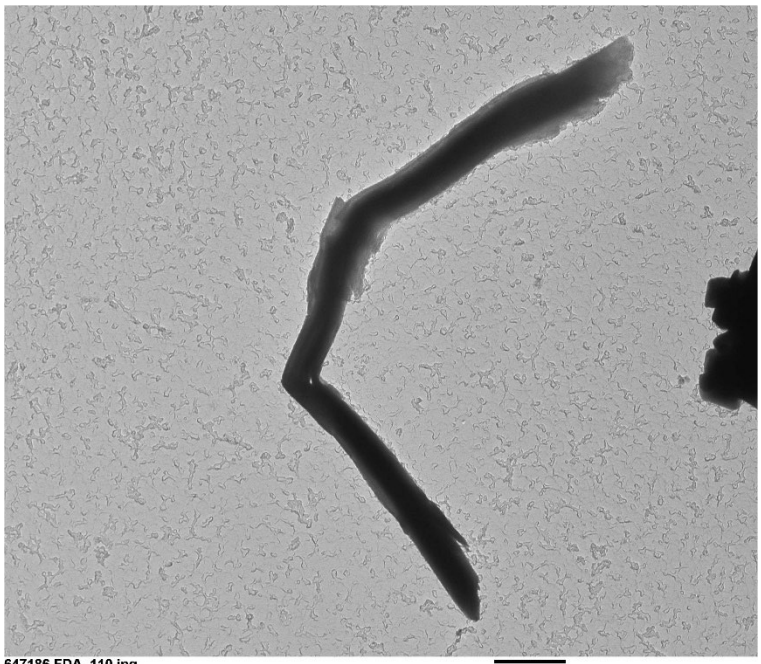
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



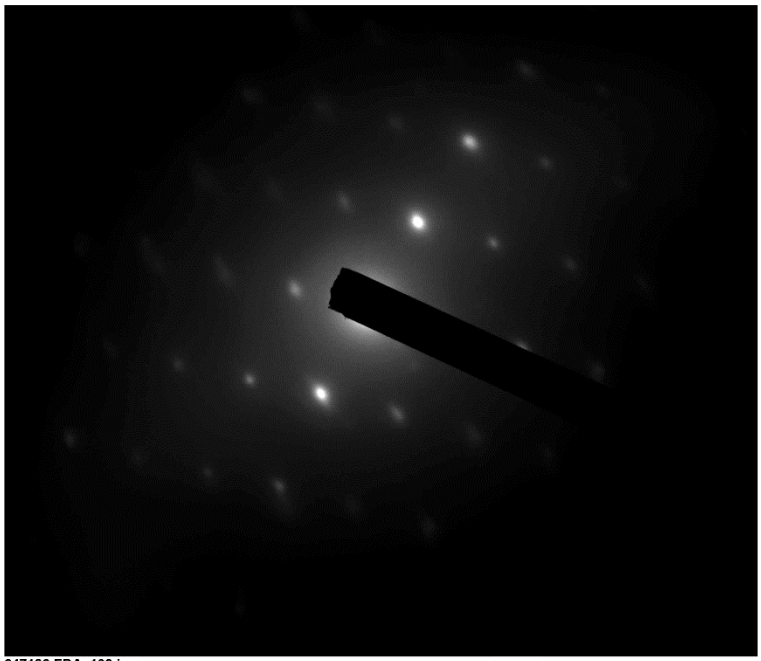
647186-10, Talc Ribbon



647186 FDA_110.jpg
647186-10
Talc Ribbon
FDA
Cal: 0.002387 µm/pix
12:02 2023-08-24
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

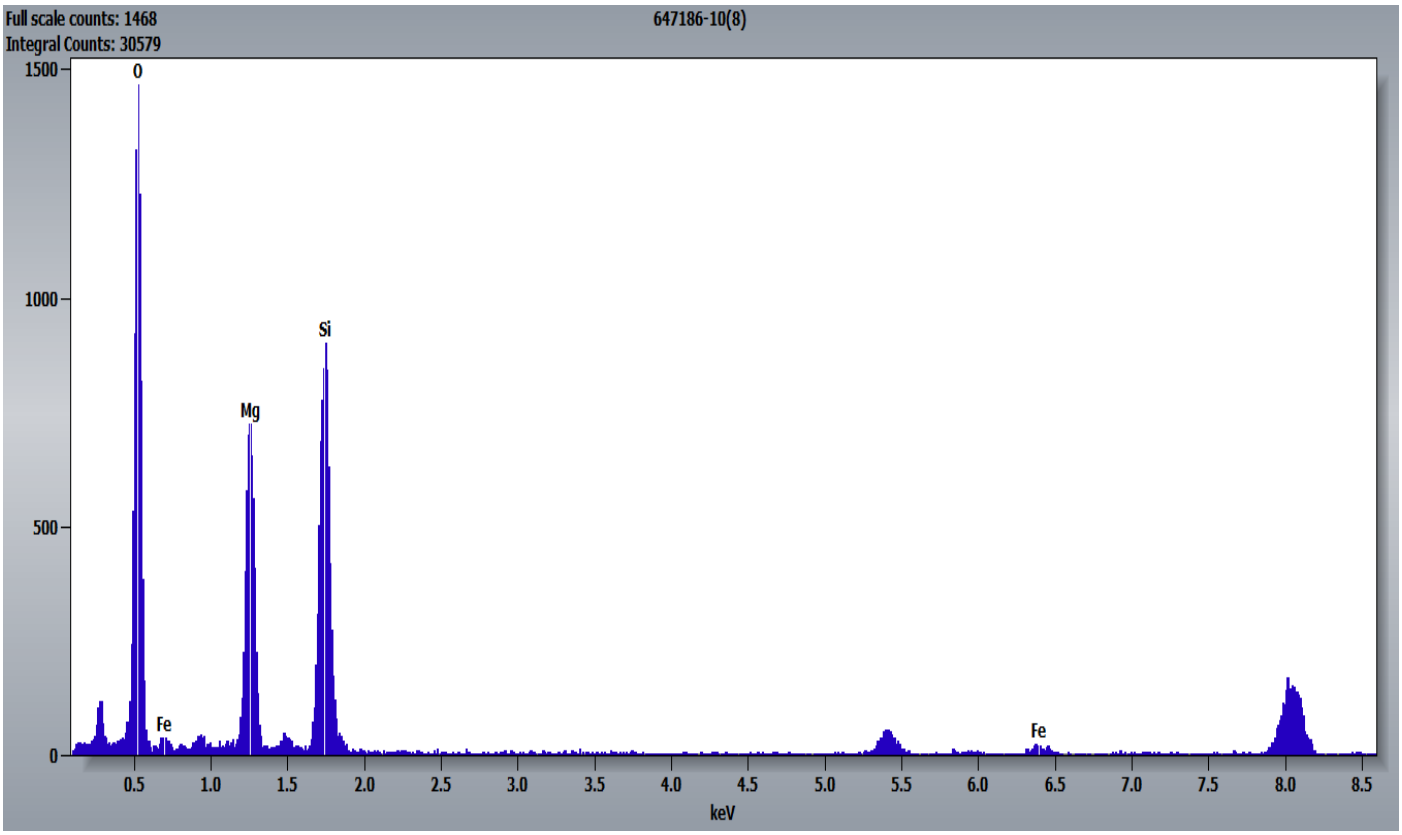
Diffraction Pattern from the Talc Ribbon Pictured Above



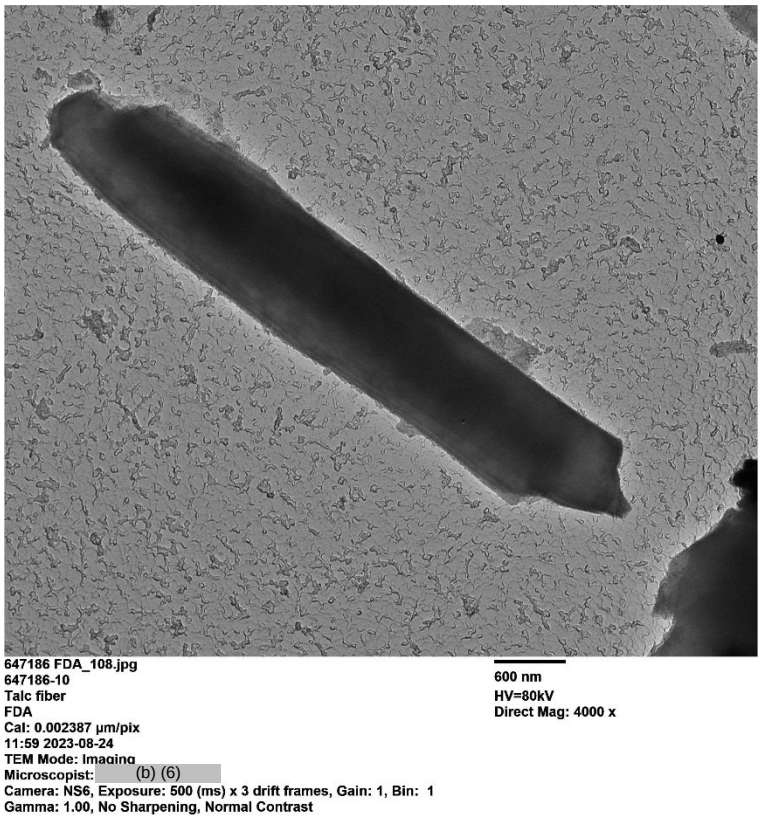
647186 FDA_109.jpg
647186-10
Talc Ribbon
FDA
Cal: 0.002387 µm/pix
12:01 2023-08-24
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

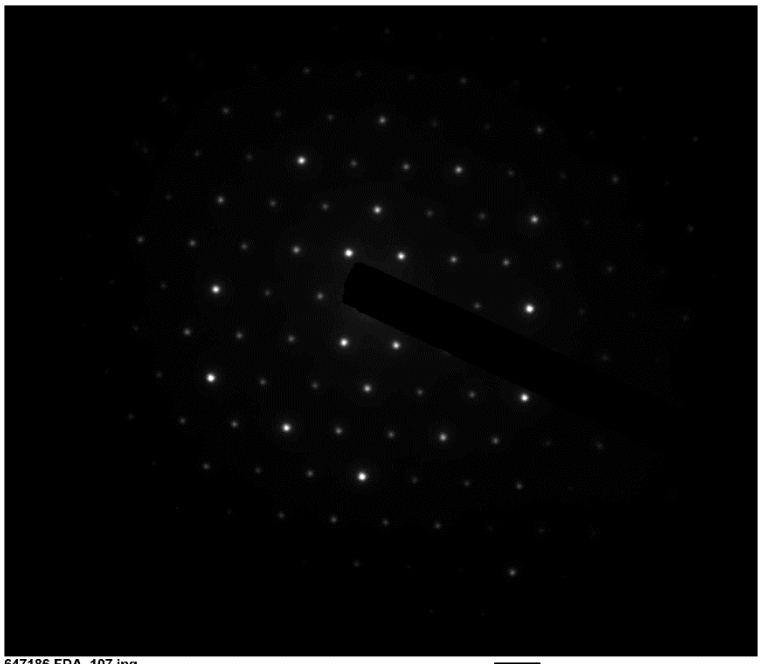
Chemistry from the Talc Ribbon Pictured Above



647186-10, Elongated Talc Particle



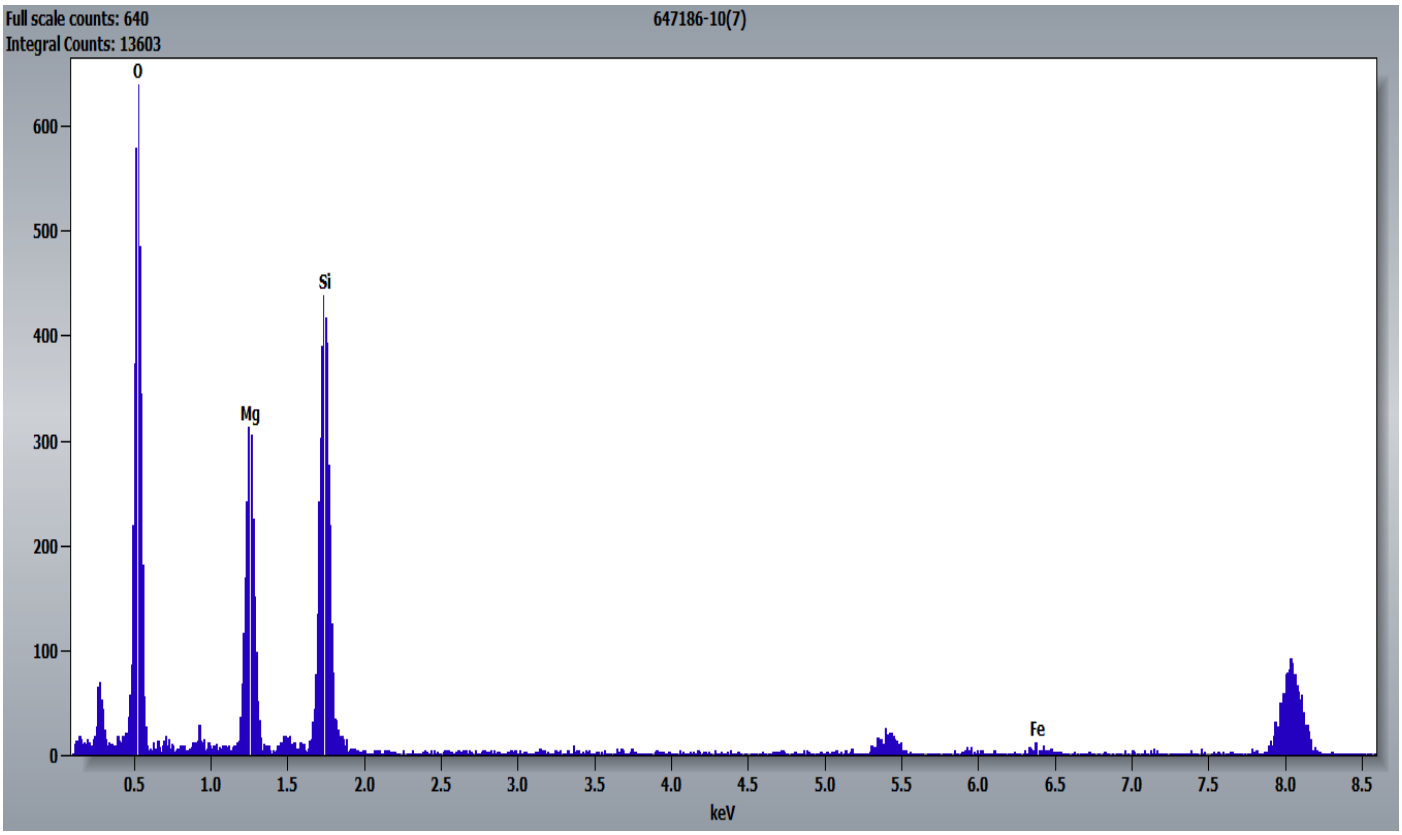
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



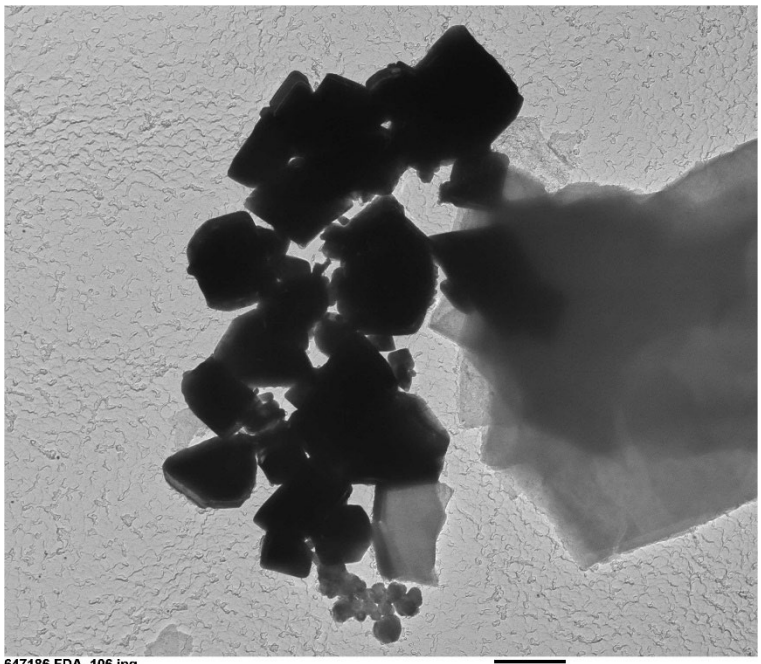
647186 FDA_107.jpg
647186-10
Talc fiber
FDA
Cal: 0.002387 µm/pix
11:57 2023-08-24
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Talc Particle Pictured Above



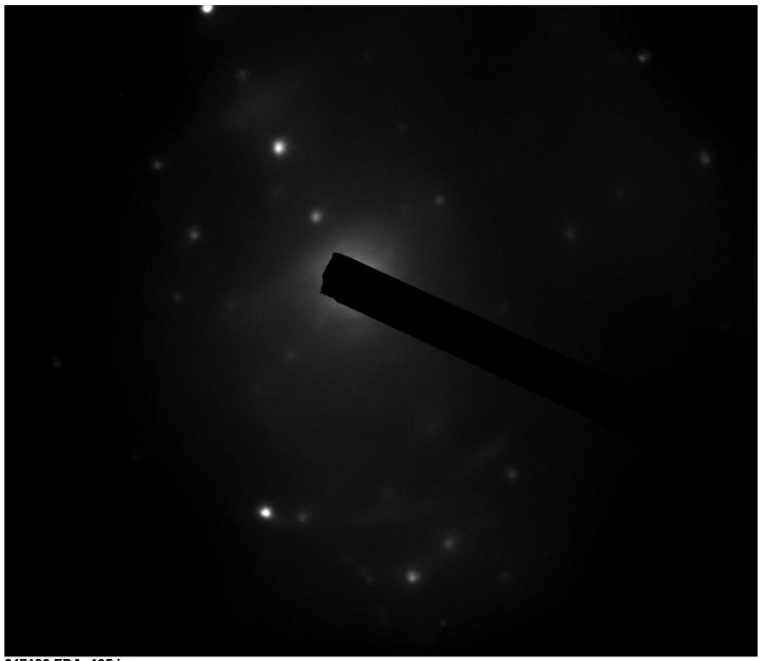
647186-10, Iron Particles



647186 FDA_106.jpg
647186-10
Fe particles
FDA
Cal: 0.002387 µm/pix
11:52 2023-08-24
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

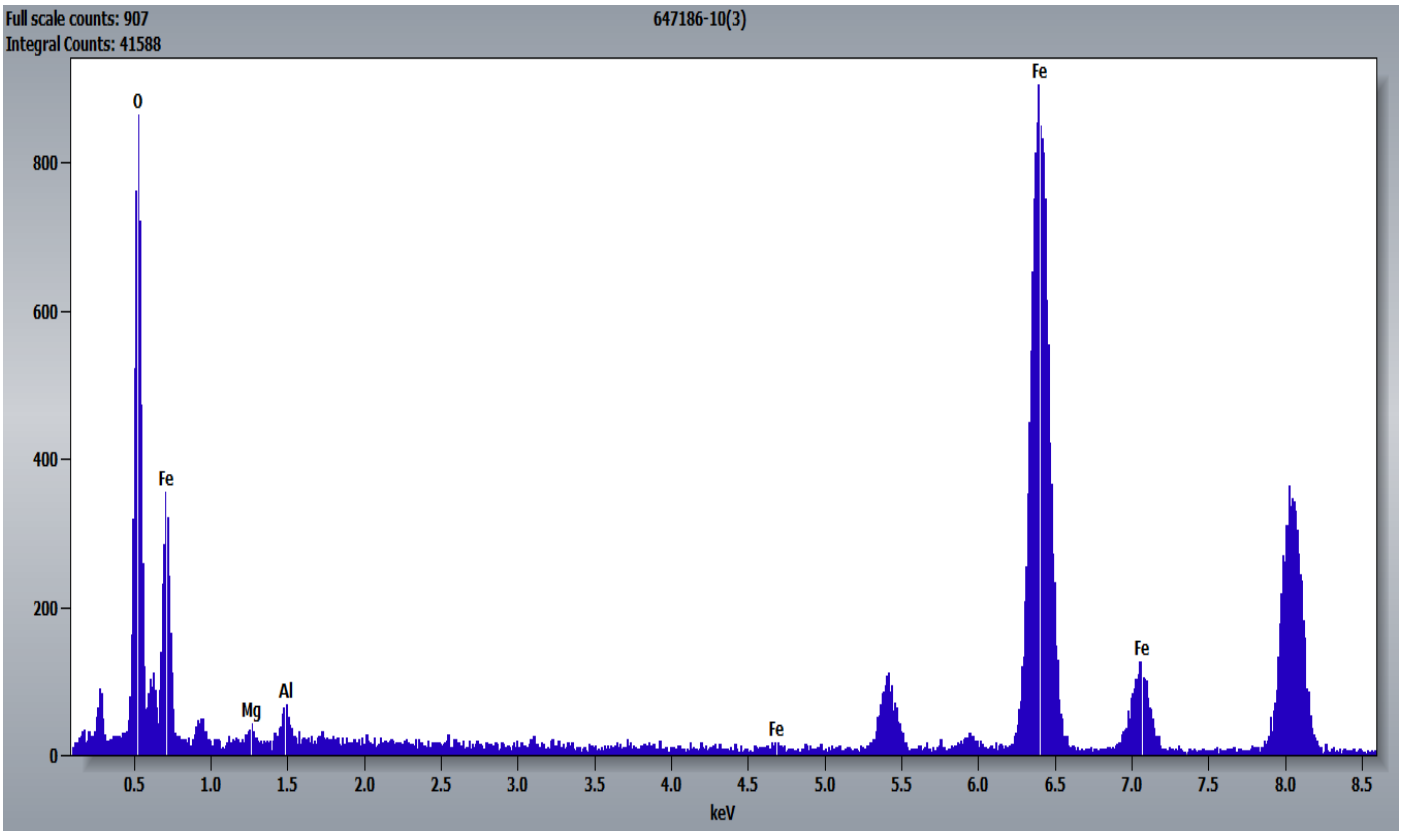
Diffraction Pattern from the Iron Particles Pictured Above



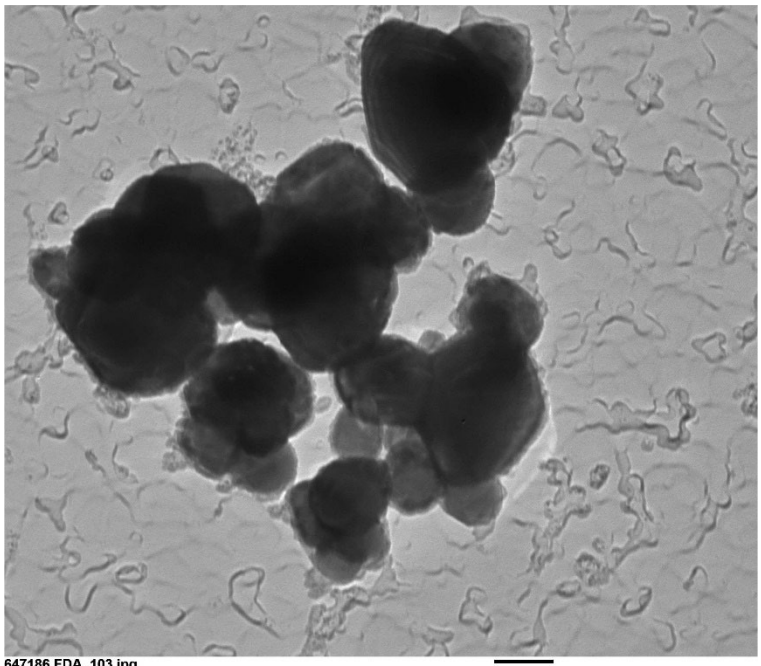
647186 FDA_105.jpg
647186-10
Fe particles
FDA
Cal: 0.000477 µm/pix
11:50 2023-08-24
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Iron Particles Pictured Above

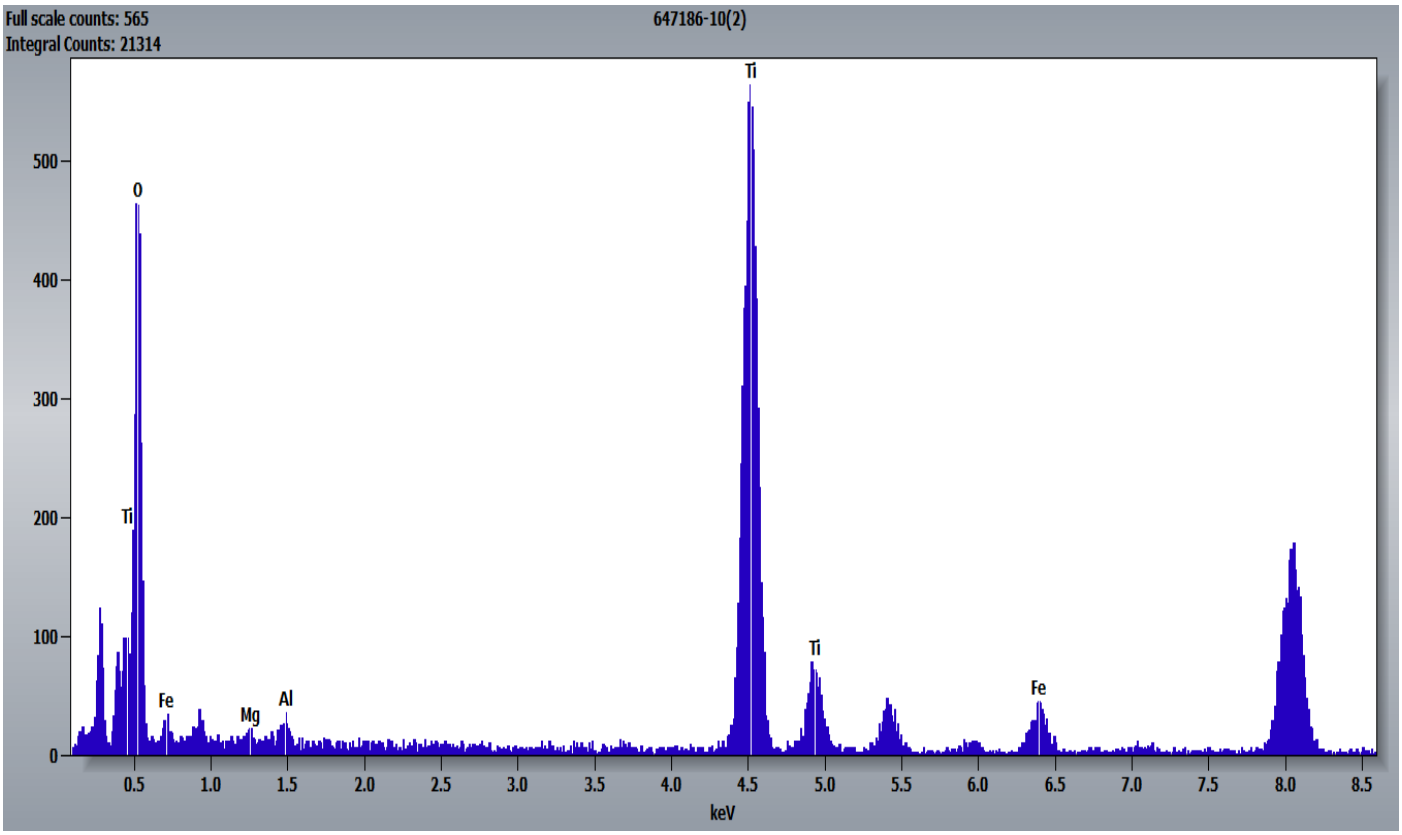


647186-10, Titanium Particles

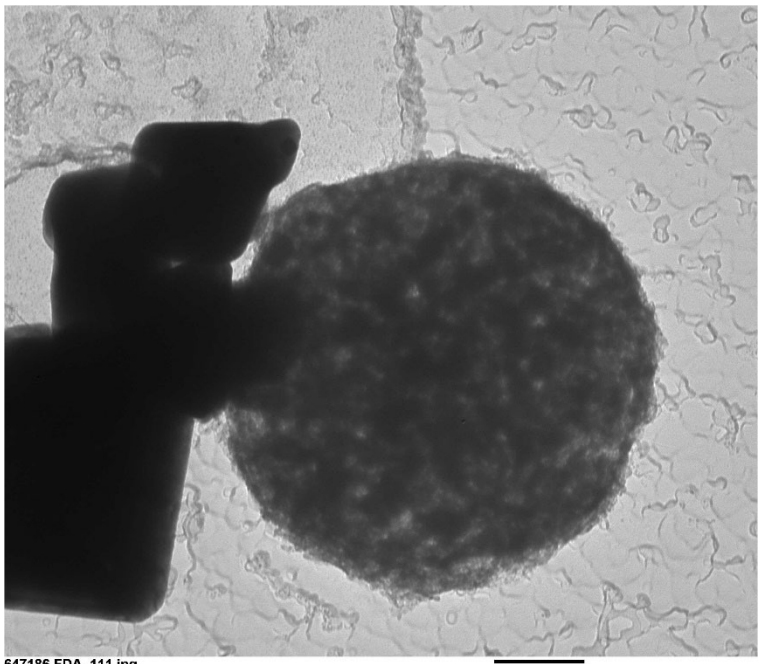


Diffraction Pattern from the Titanium Particles Pictured Above

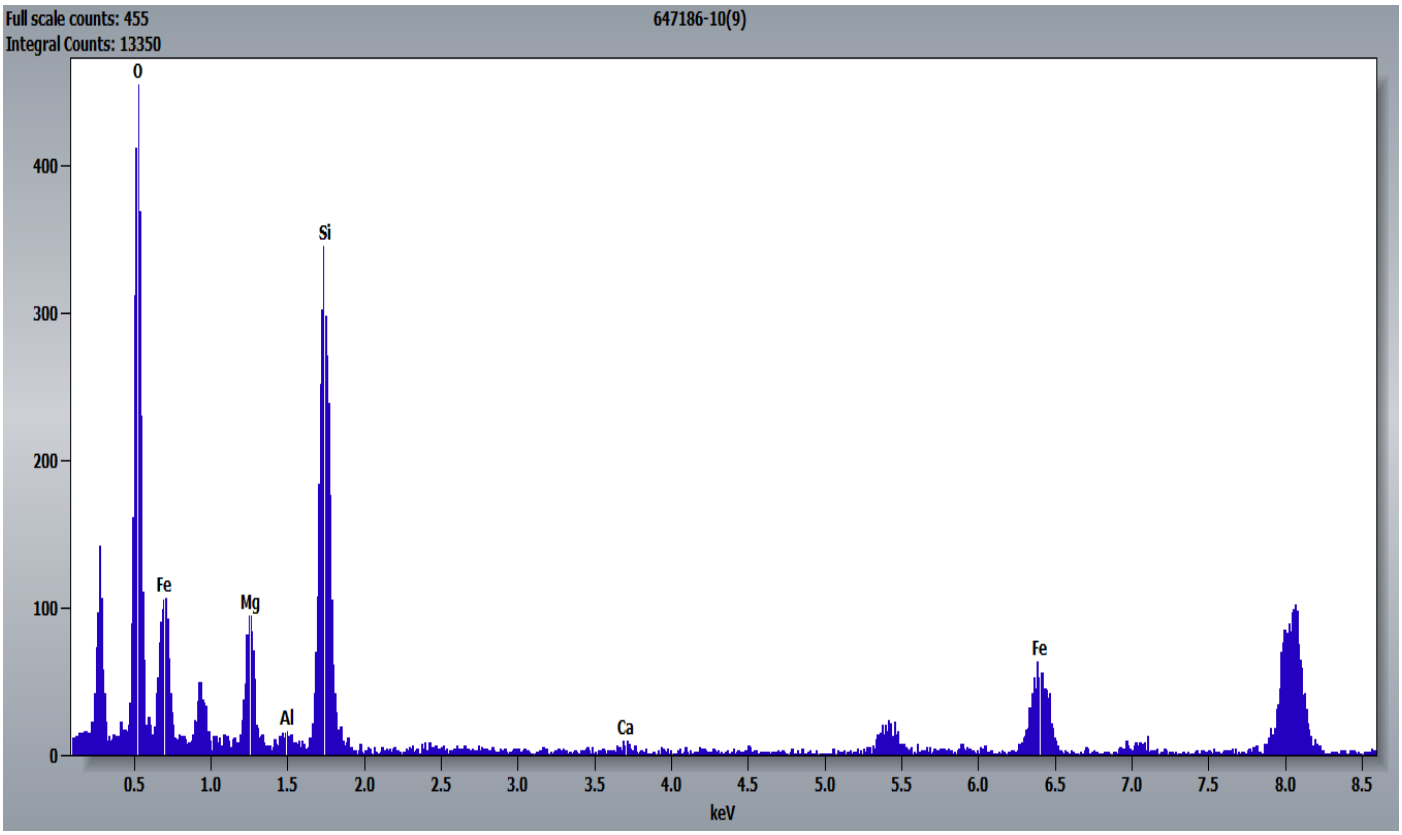
Chemistry from the Titanium Particles Pictured Above



647186-10, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-11, 11A, 11B/Client Sample: 05162023-11

PLM

All three aliquots of sample 05162023-11 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-11	No Asbestos Detected
647186-11A	No Asbestos Detected
647186-11B	No Asbestos Detected

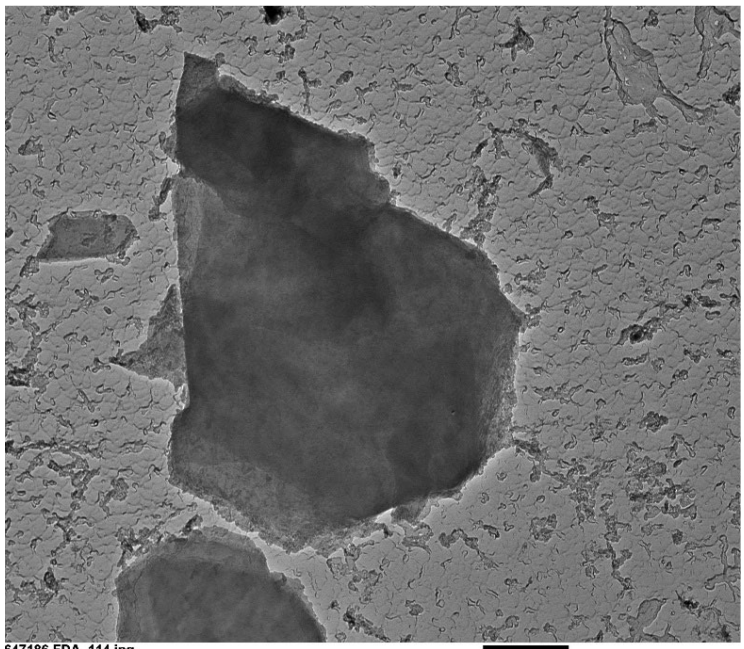
TEM

(b) (6) analyzed aliquot 11 on August 28, 2023. (b) (6) analyzed aliquot 11A August 25, 2023, and (b) (6) analyzed aliquot 11B on August 25, 2023. The primary particles observed were talc and talc ribbons/fibers; iron and titanium particles were also observed along with silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-11	No Asbestos Detected
647186-11A	No Asbestos Detected
647186-11B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-11, Talc Particle

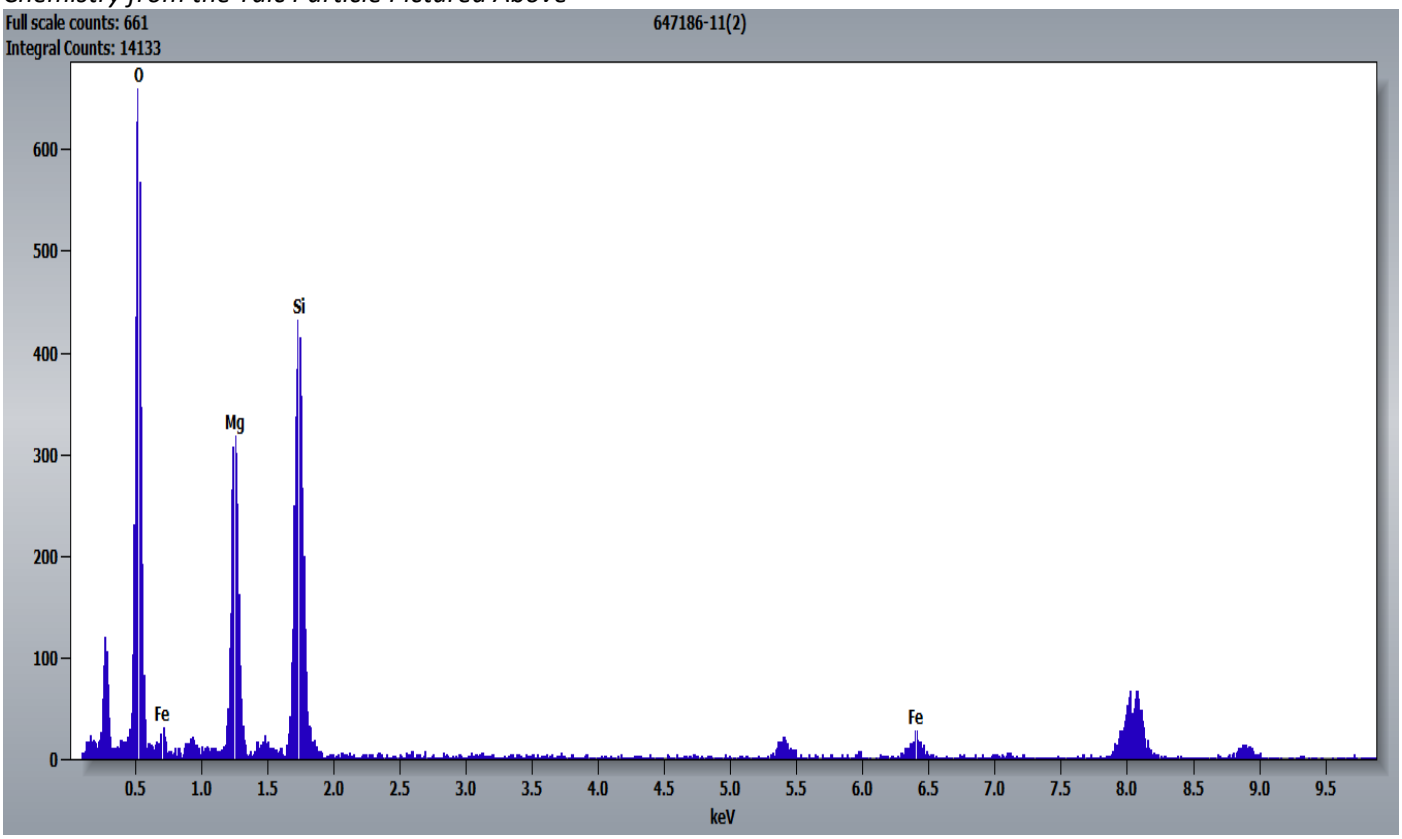


Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

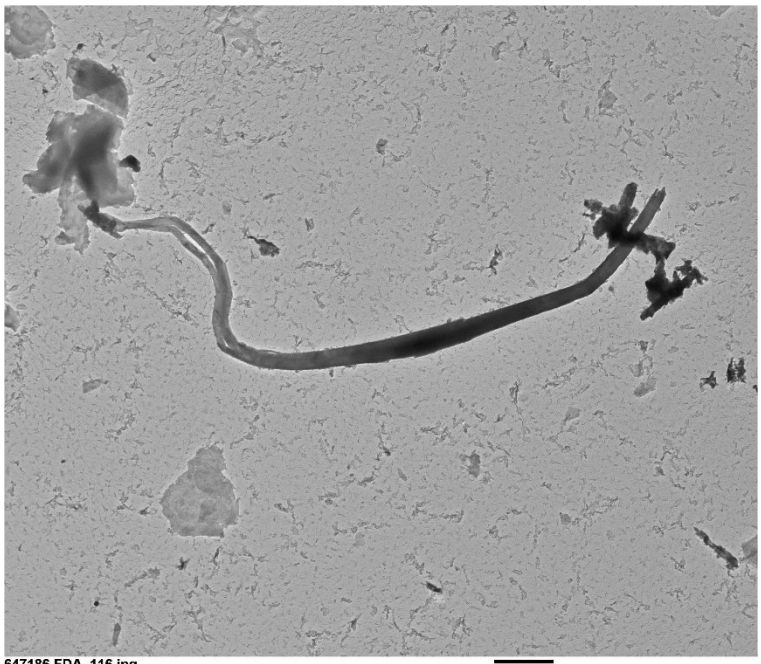
647186 FDA_113.jpg
647186-11
Talc
FDA
Cal: 0.003819 µm/pix
11:32 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle Pictured Above



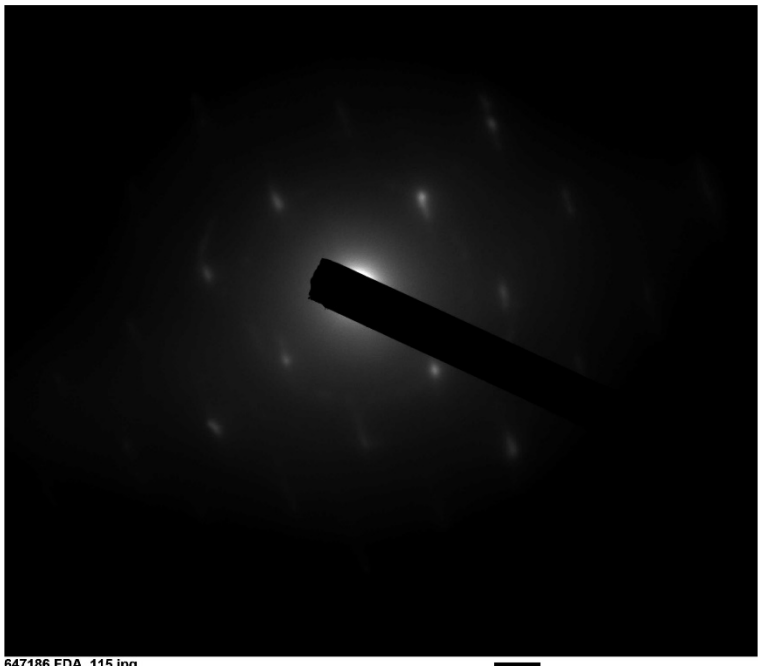
647186-11, Talc Ribbon



647186 FDA_116.jpg
647186-11
Talc ribbon
FDA
Cal: 0.004774 µm/pix
11:40 2023-08-28
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2000 x

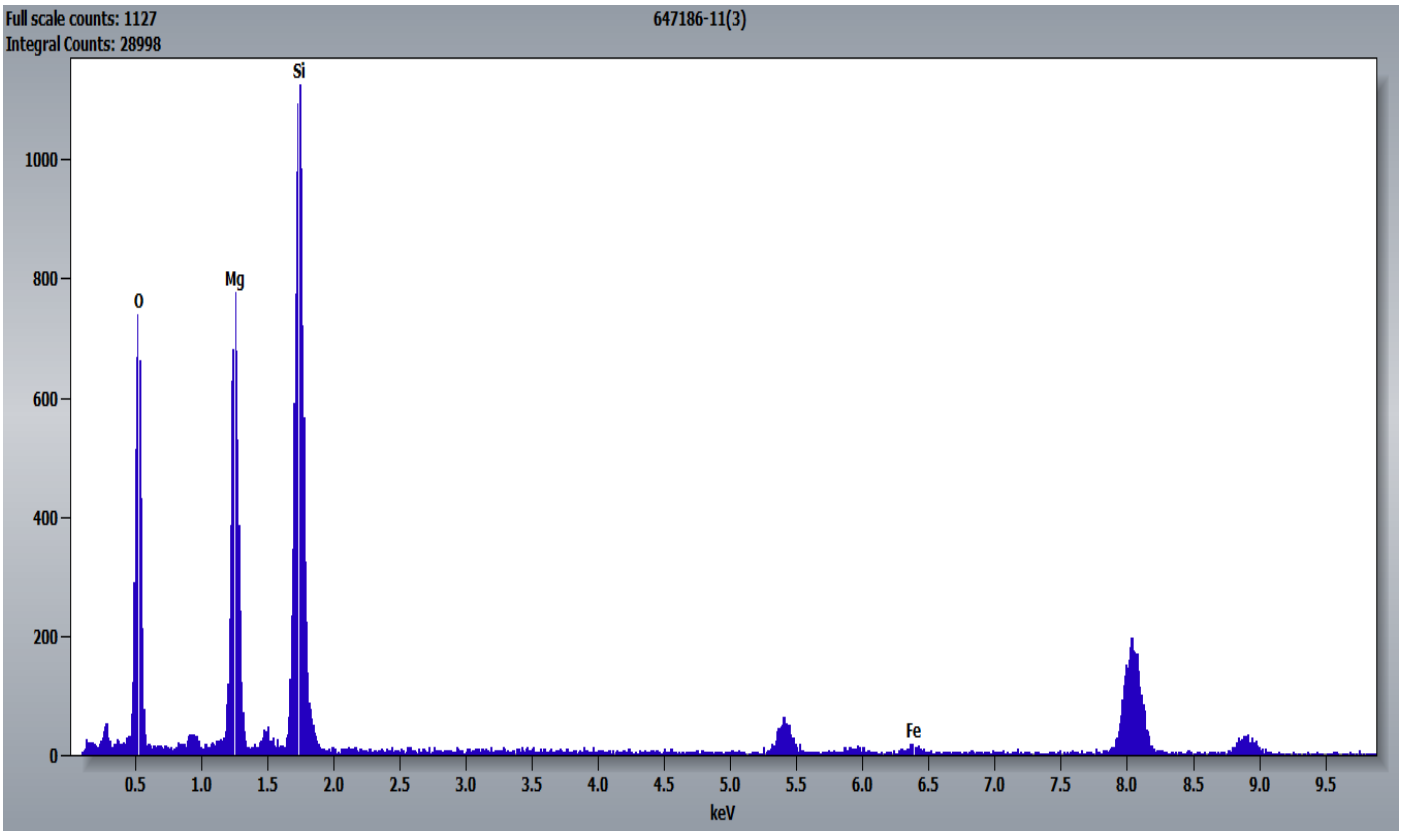
Diffraction Pattern from the Talc Ribbon Pictured Above



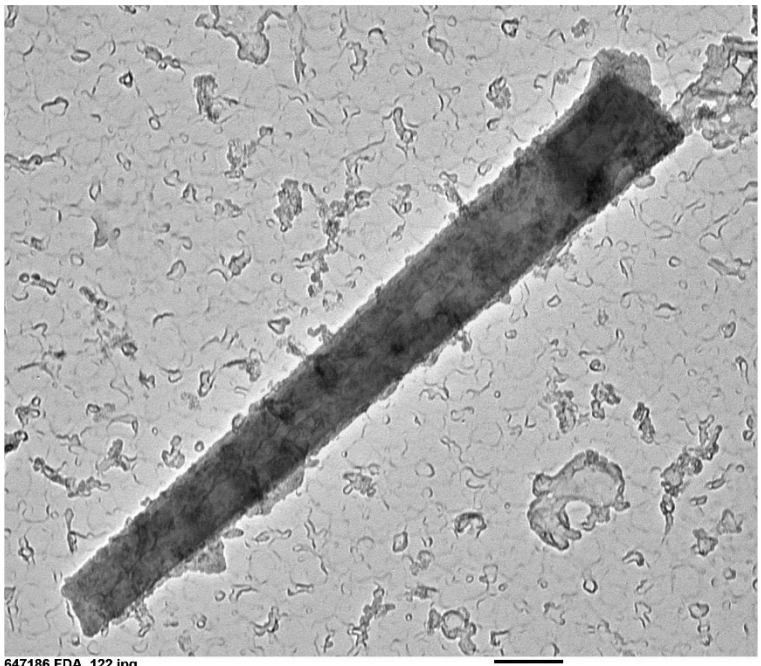
647186 FDA_115.jpg
647186-11
Talc ribbon
FDA
Cal: 0.001612 µm/pix
11:38 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



647186-11, Talc Fiber

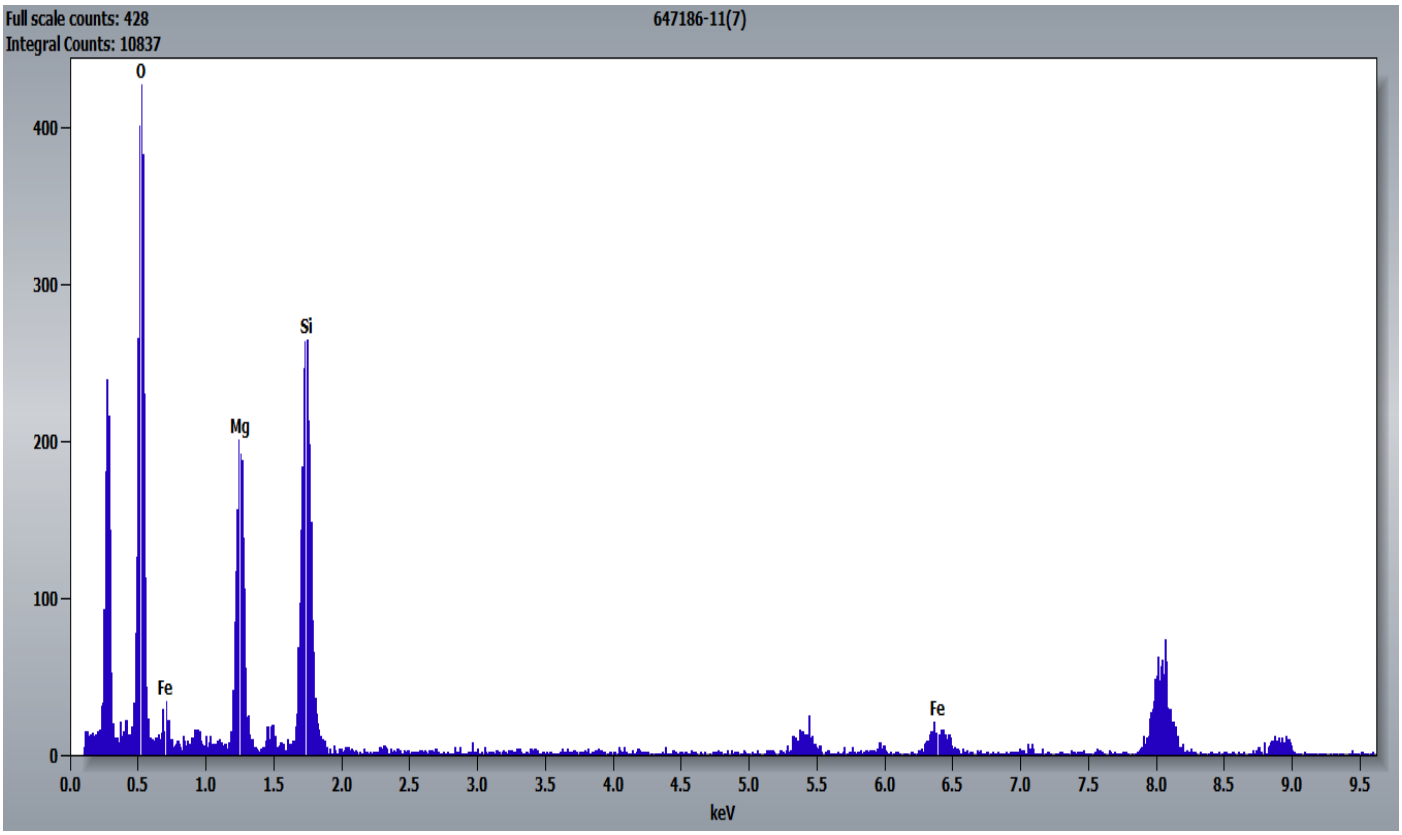


Hexagonal Diffraction Pattern from the Talc Fiber Pictured Above

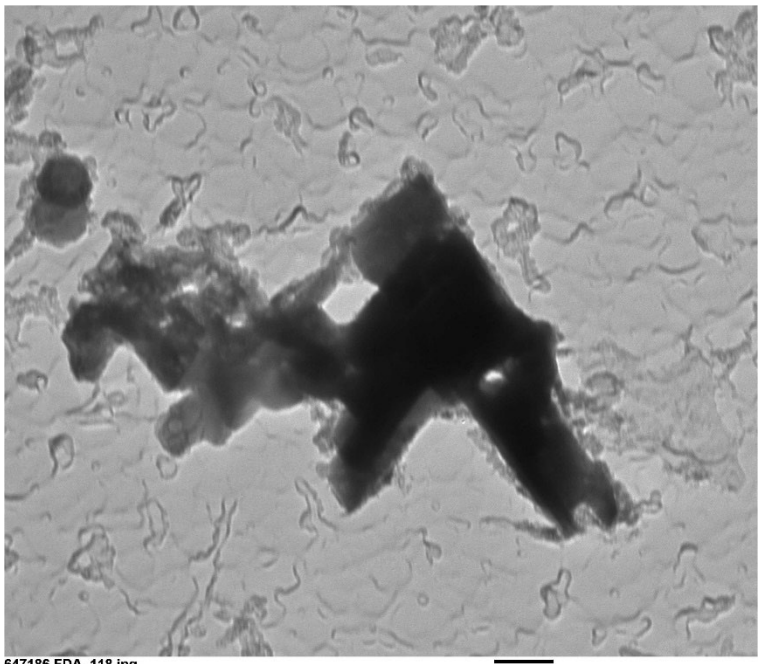
647186 FDA_121.jpg
647186-11
Talc fiber
FDA
Cal: 0.000477 µm/pix
11:56 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Fiber Pictured Above



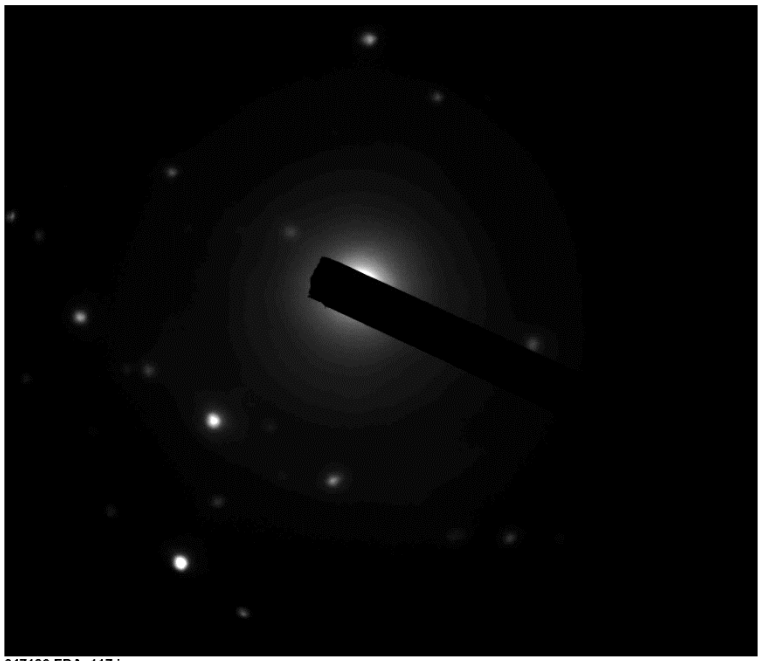
647186-11, Iron Particles



647186 FDA_118.jpg
647186-11
Fe particles
FDA
Cal: 0.000477 µm/pix
11:45 2023-08-28
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 nm
HV=80kV
Direct Mag: 20000 x

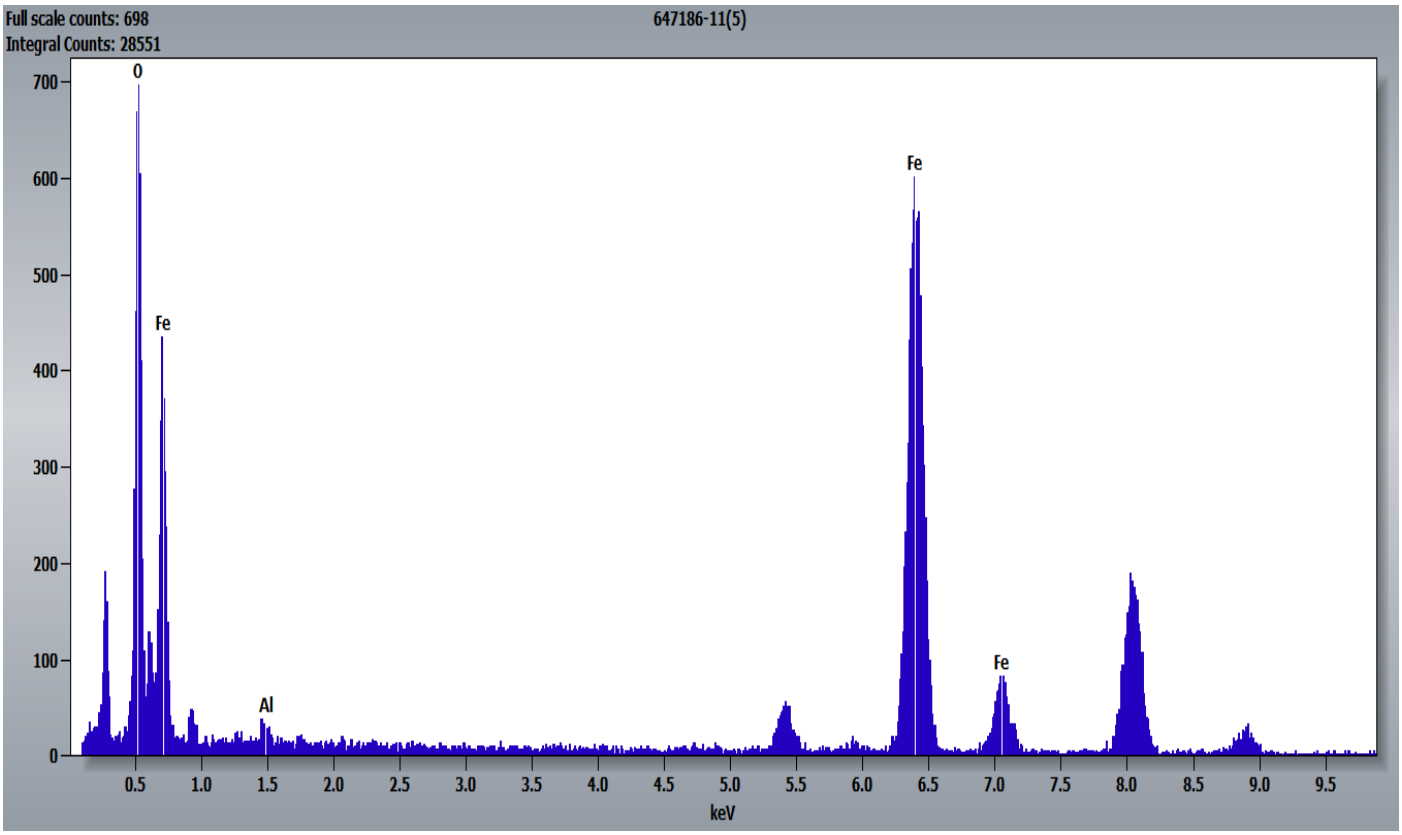
Diffraction Pattern from the Iron Particles Pictured Above



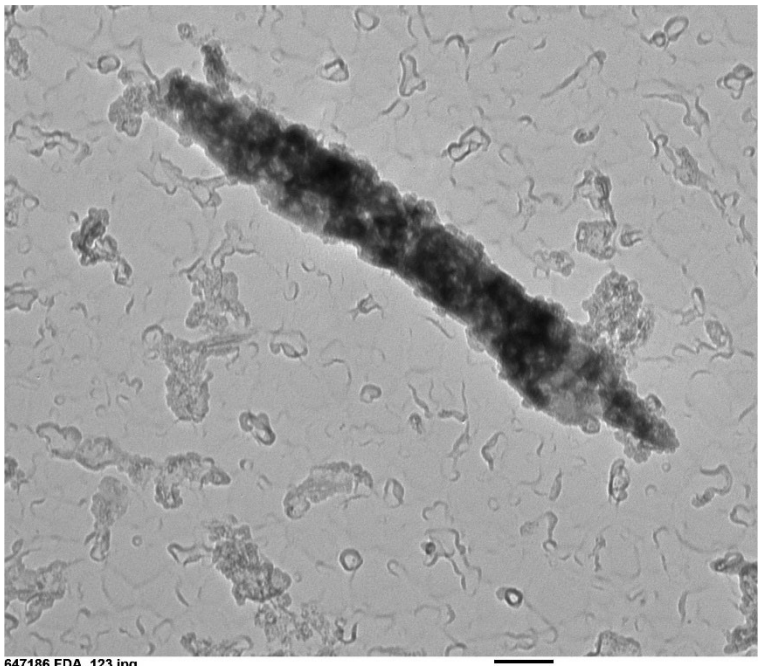
647186 FDA_117.jpg
647186-11
Fe particles
FDA
Cal: 0.004774 µm/pix
11:44 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

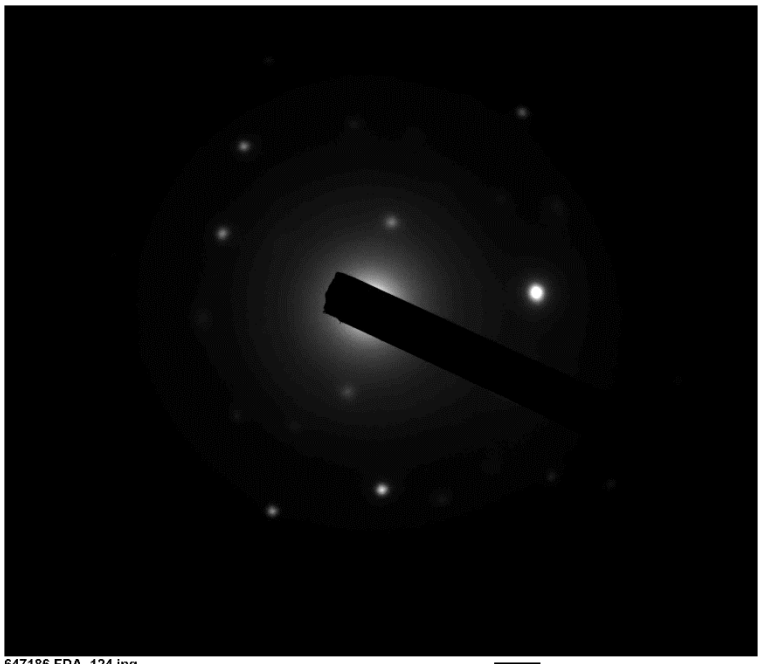
Chemistry from the Iron Particles Pictured Above



647186-11, Elongated Iron Particle



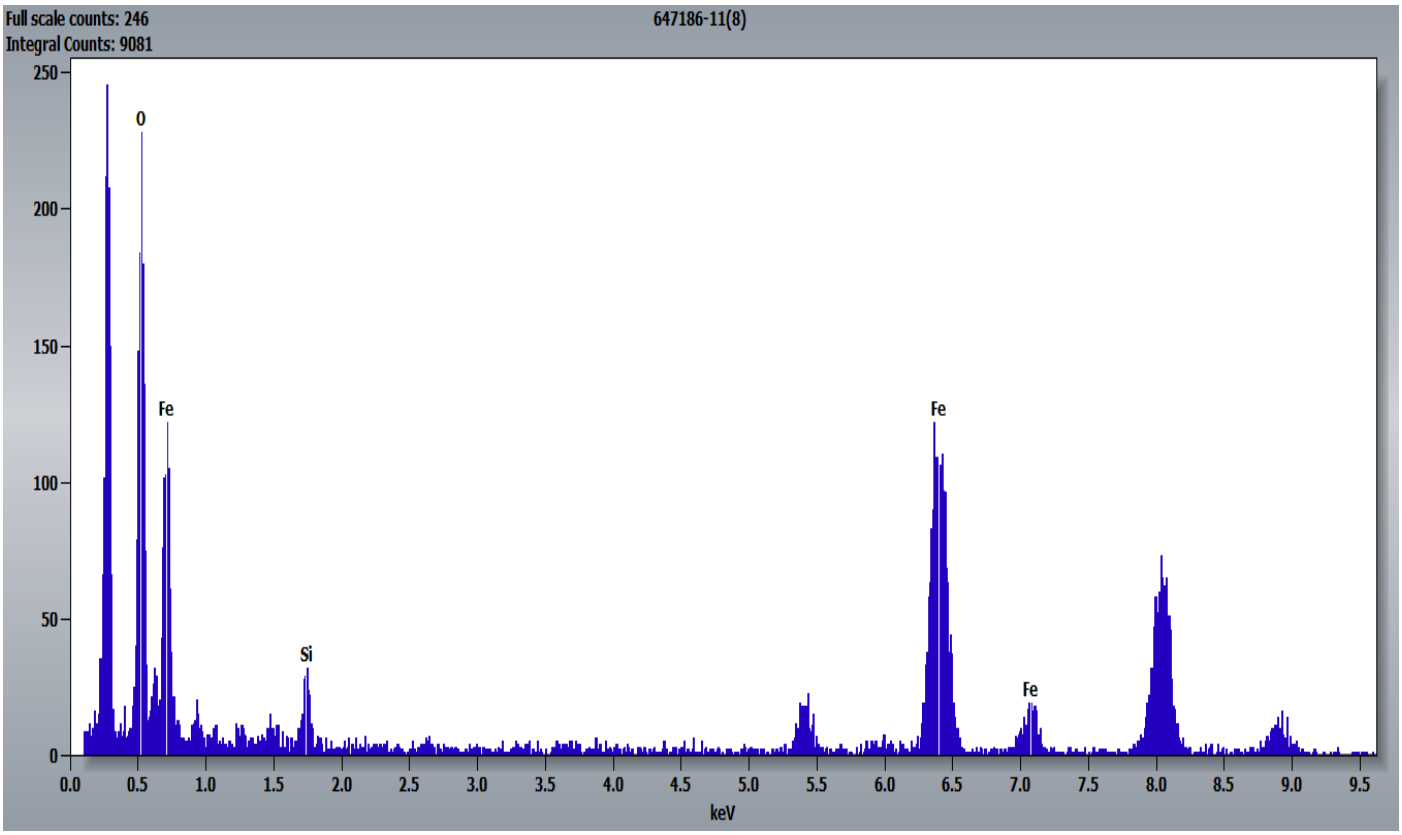
Diffraction Pattern from the Elongated Iron Particle Pictured Above



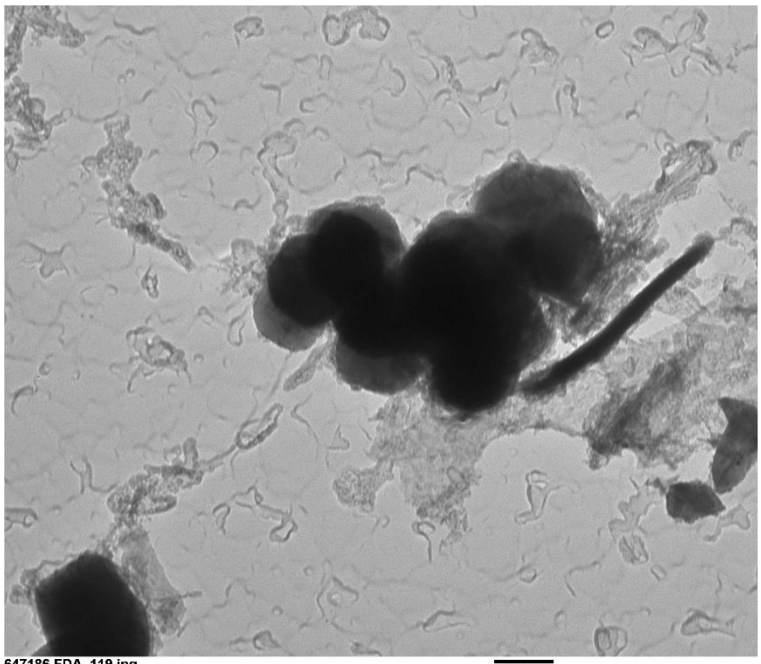
647186 FDA_124.jpg
647186-11
Fe fiber
FDA
Cal: 0.000477 µm/pix
12:08 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Iron Particle Pictured Above



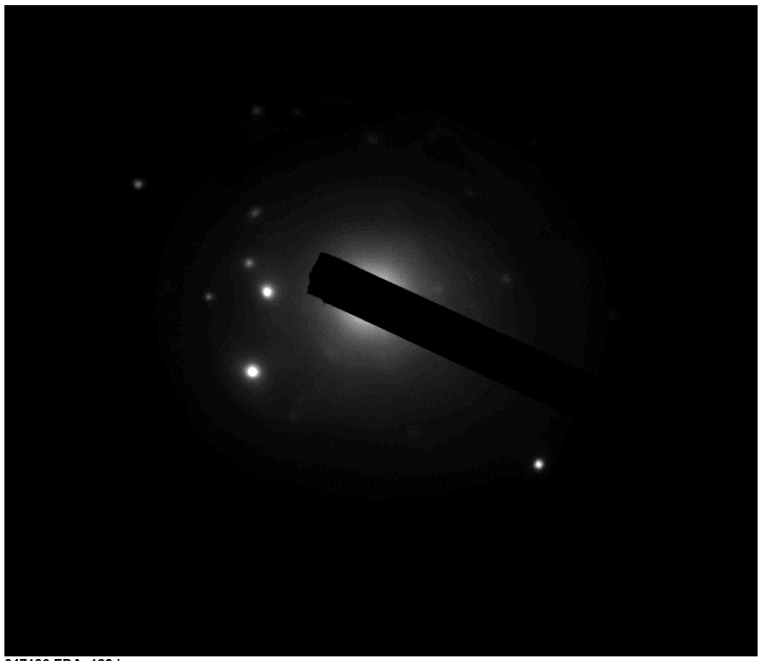
647186-11, Titanium Particles



647186 FDA_119.jpg
647186-11
Ti particles
FDA
Cal: 0.000477 µm/pix
11:48 2023-08-28
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 nm
HV=80kV
Direct Mag: 20000 x

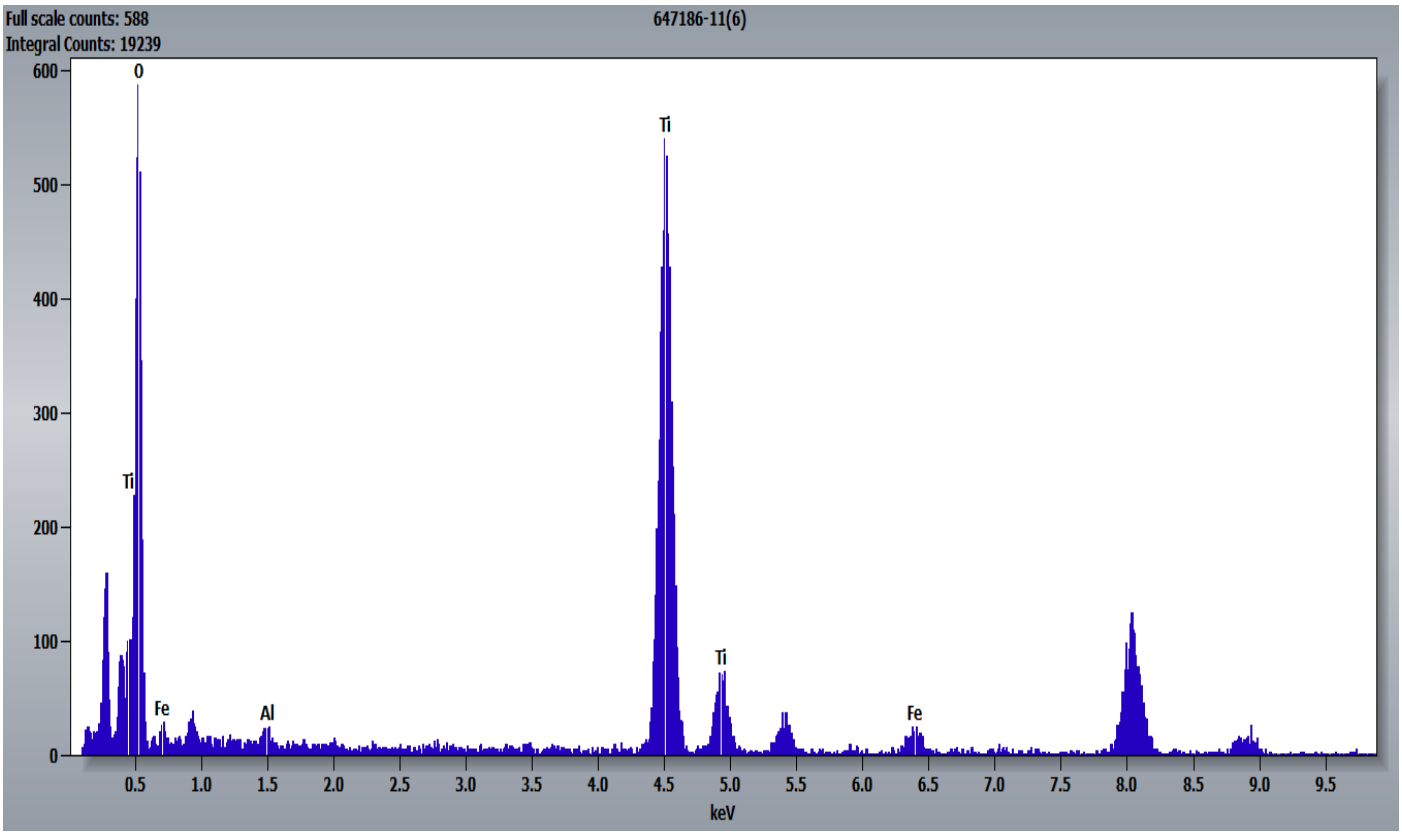
Diffraction Pattern from the Titanium Particles Pictured Above



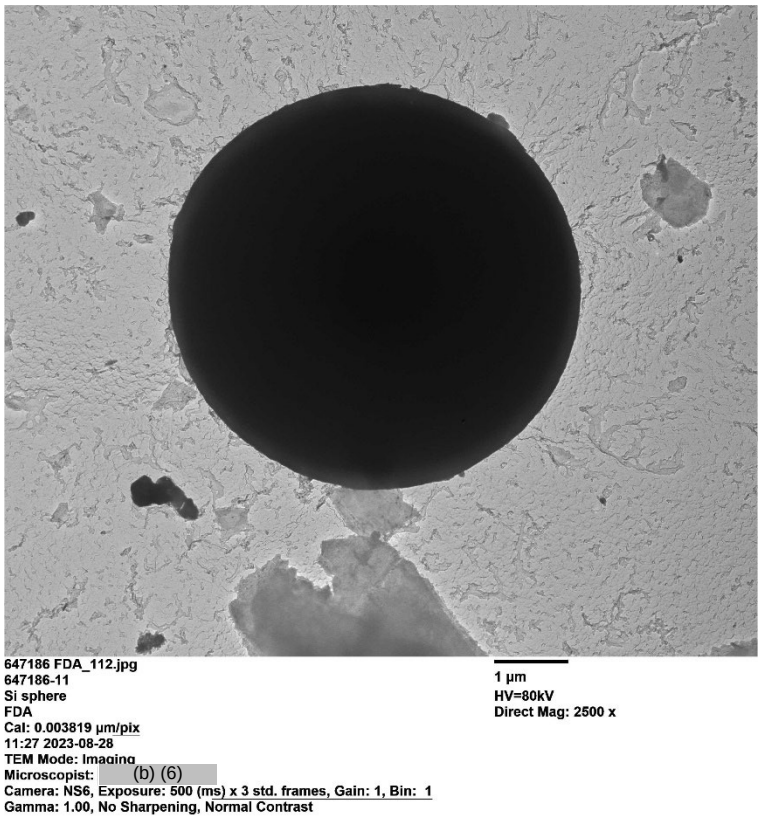
647186 FDA_120.jpg
647186-11
Ti particles
FDA
Cal: 0.000477 µm/pix
11:49 2023-08-28
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

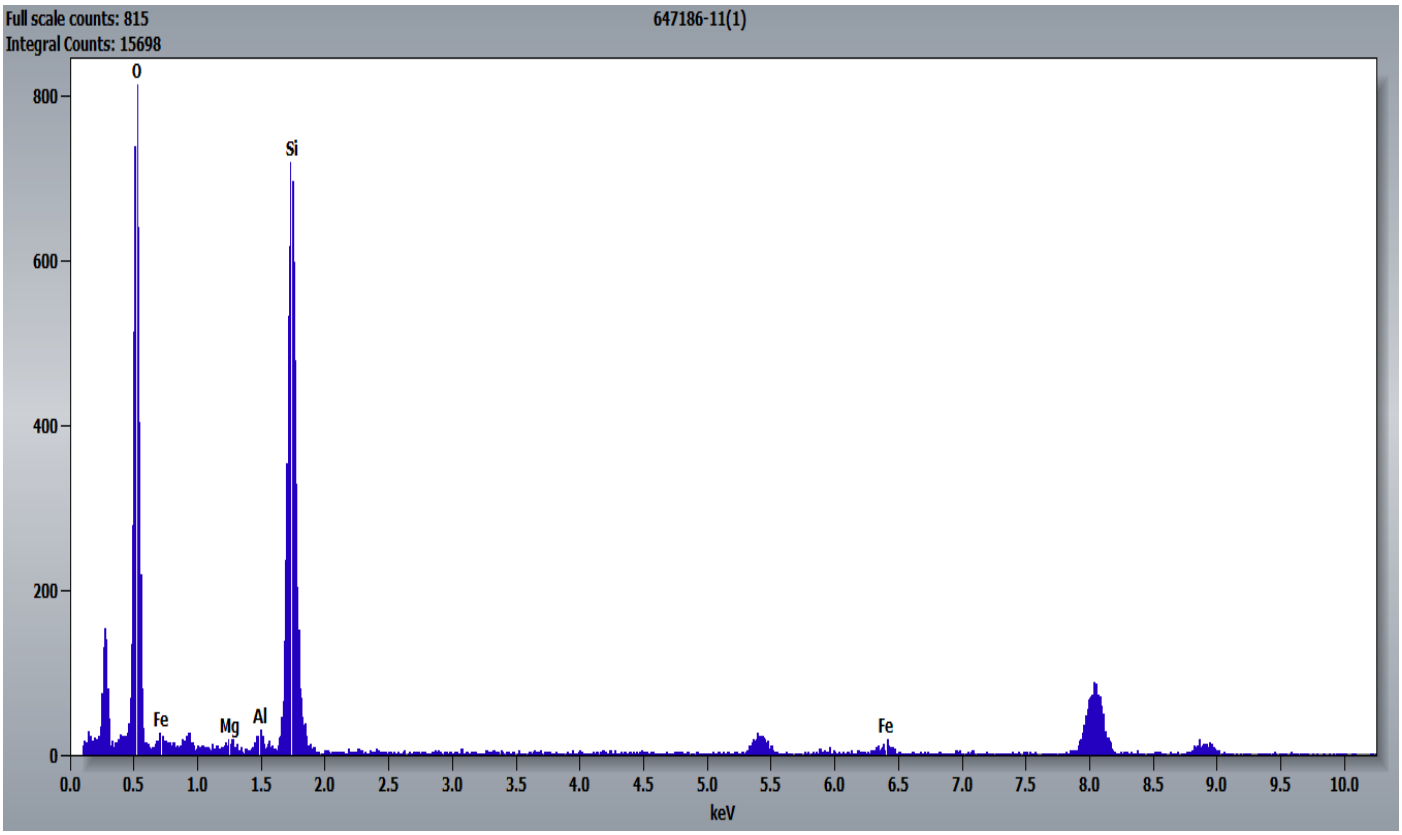
Chemistry from the Titanium Particles Pictured Above



647186-11, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-12, 12A, 12B/Client Sample: 05162023-12

PLM

All three aliquots of sample 05162023-12 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-12	No Asbestos Detected
647186-12A	No Asbestos Detected
647186-12B	No Asbestos Detected

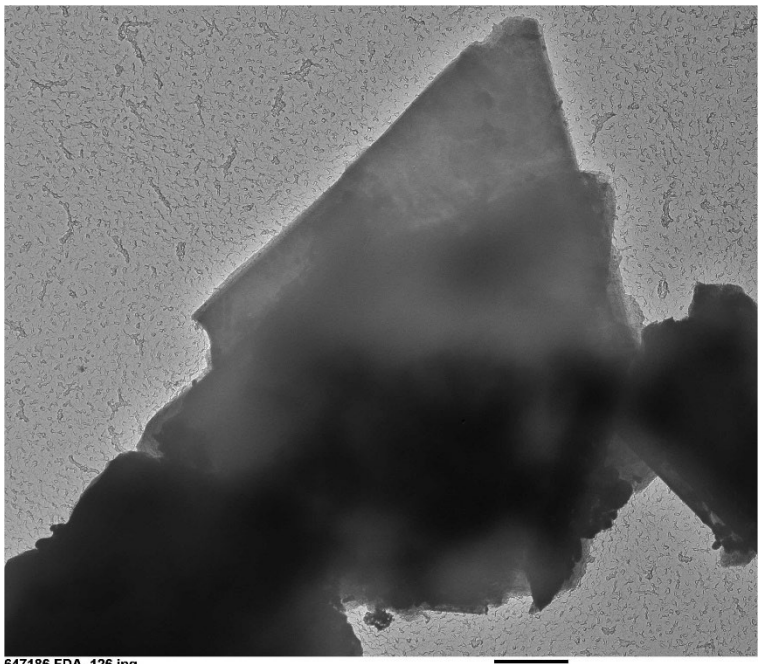
TEM

(b) (6) analyzed aliquot 12 on August 28, 2023. (b) (6) analyzed aliquots 12A and 12B on August 28, 2023. The primary particle observed was talc; iron particles and silica speres were also observed along with talc ribbons/fibers and particles containing magnesium, aluminum, and silicon. A single actinolite particle was observed on aliquot 12. The results were calculated using the equations detailed in the *Calculations* section above.

647186-12	< 0.01209%
647186-12A	No Asbestos Detected
647186-12B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

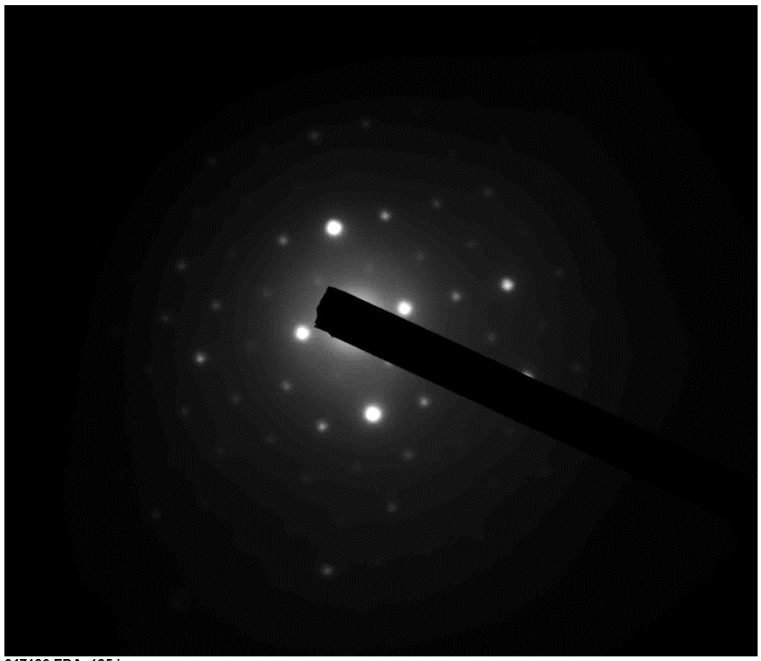
636185-12, Talc Particle



647186 FDA_126.jpg
647186-12
Talc
FDA
Cal: 0.003819 µm/pix
14:47 2023-08-28
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

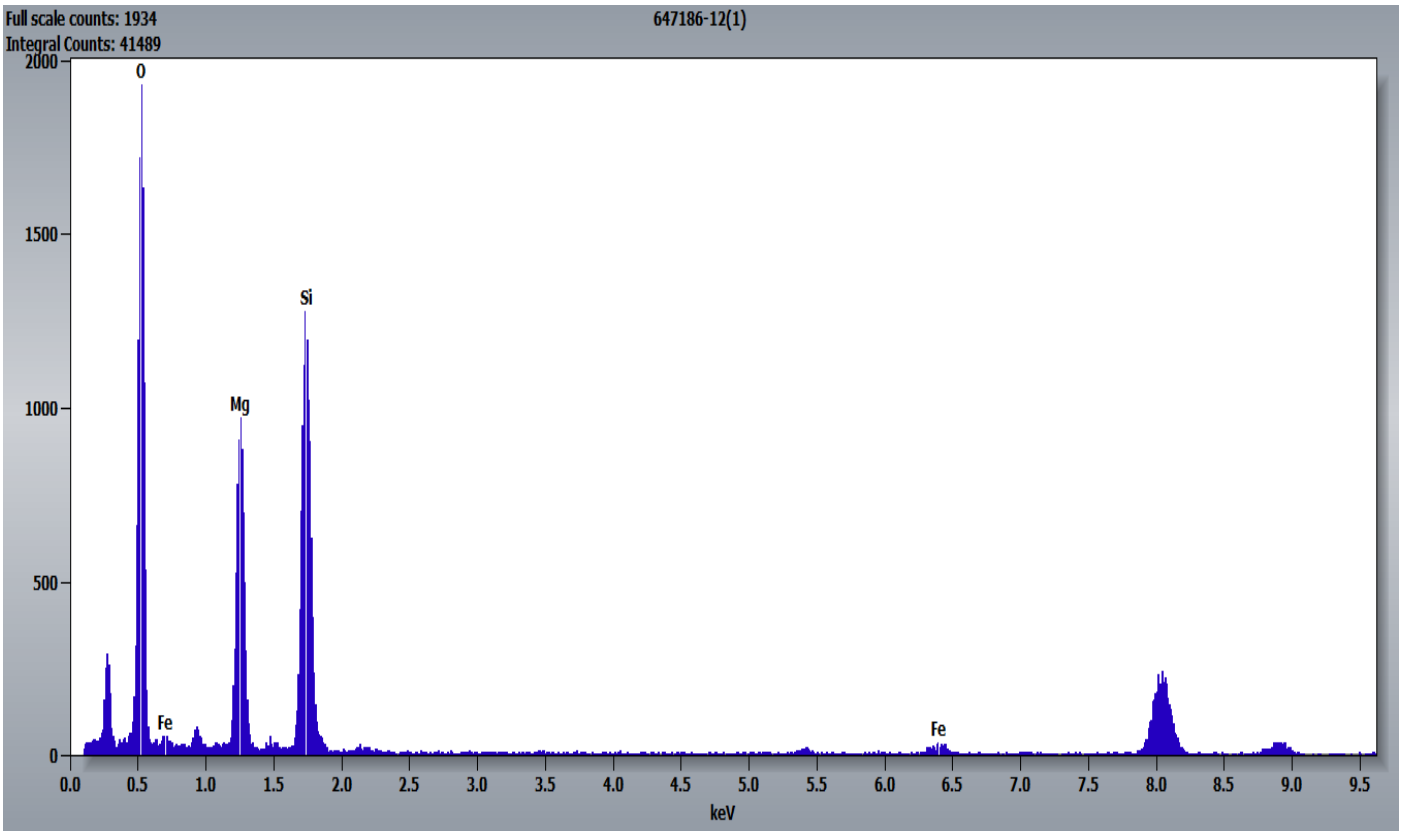


647186 FDA_125.jpg
647186-12
Talc
FDA

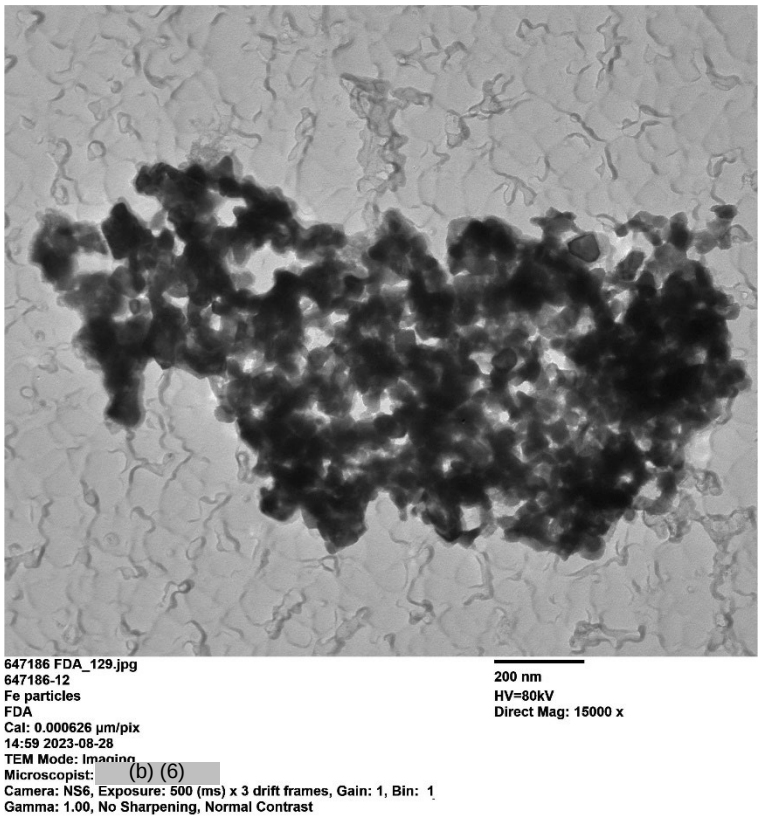
14:45 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

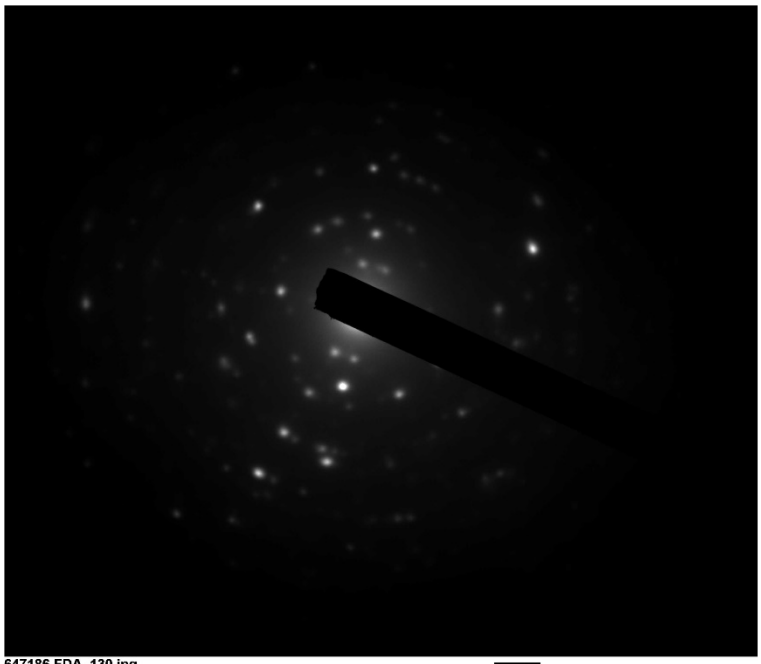
Chemistry from the Talc Particle Pictured Above



636185-12, Iron Particles



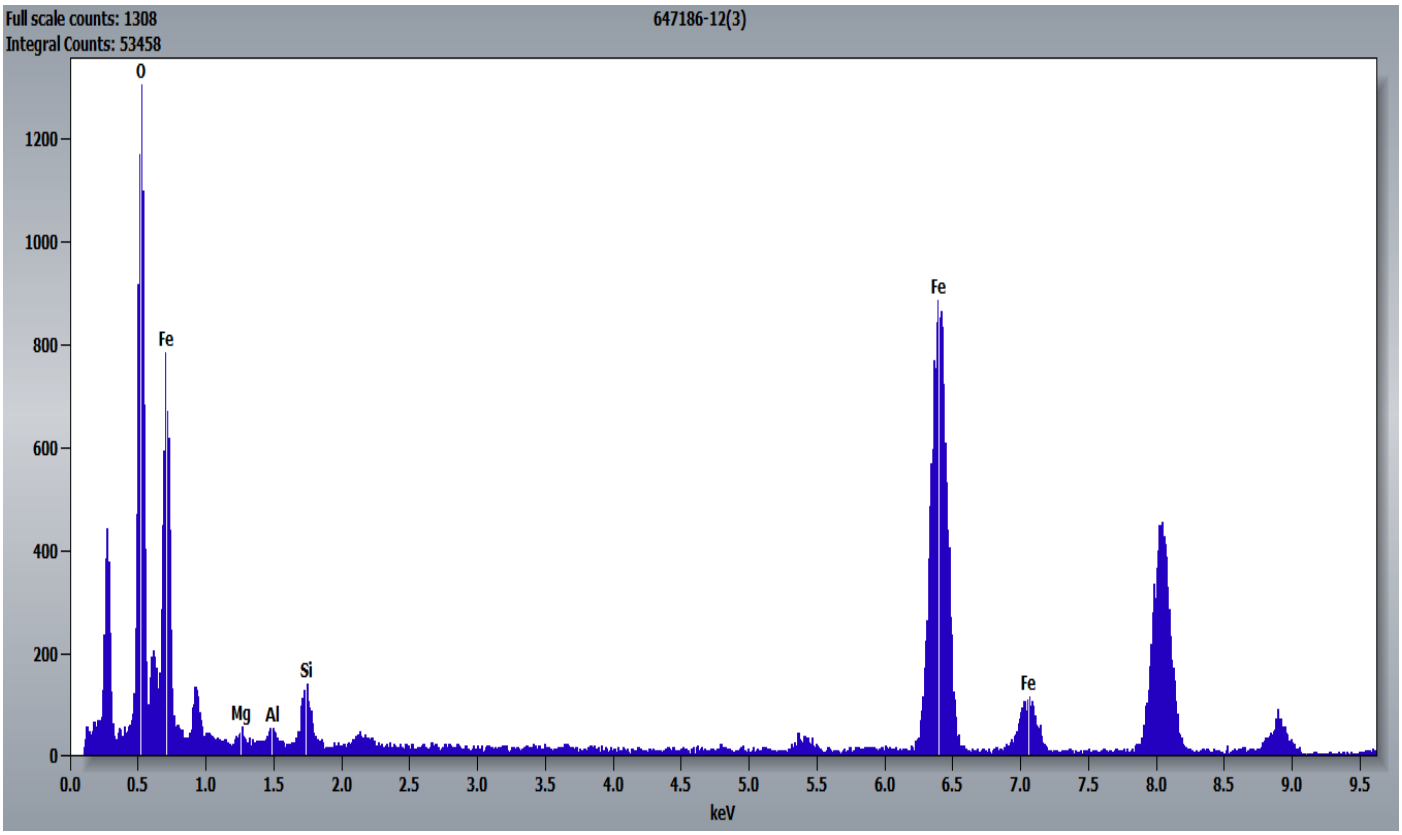
Diffraction Pattern from the Iron Particles Pictured Above



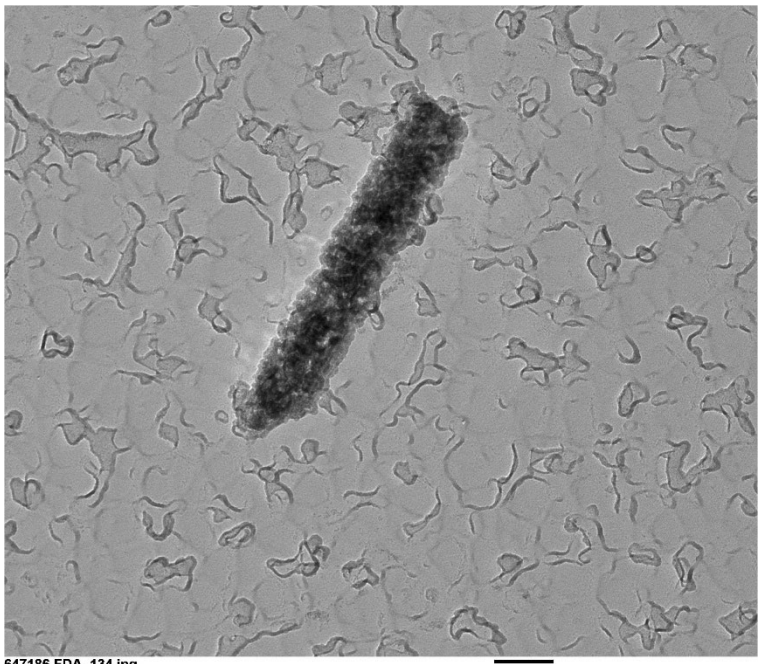
647186 FDA_130.jpg
647186-12
Fe particles
FDA
Cal: 0.000626 µm/pix
15:00 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

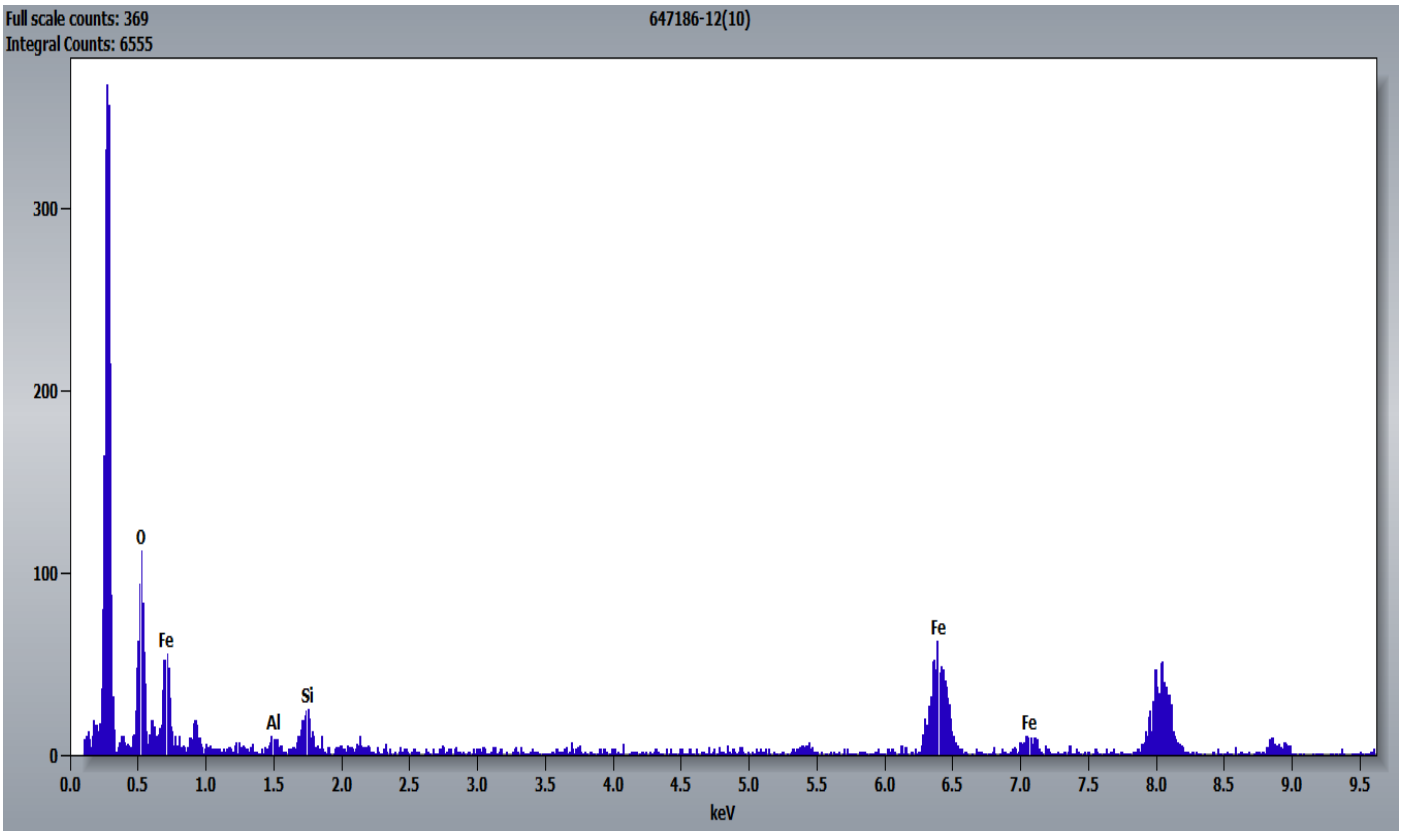
Chemistry from the Iron Particles Pictured Above



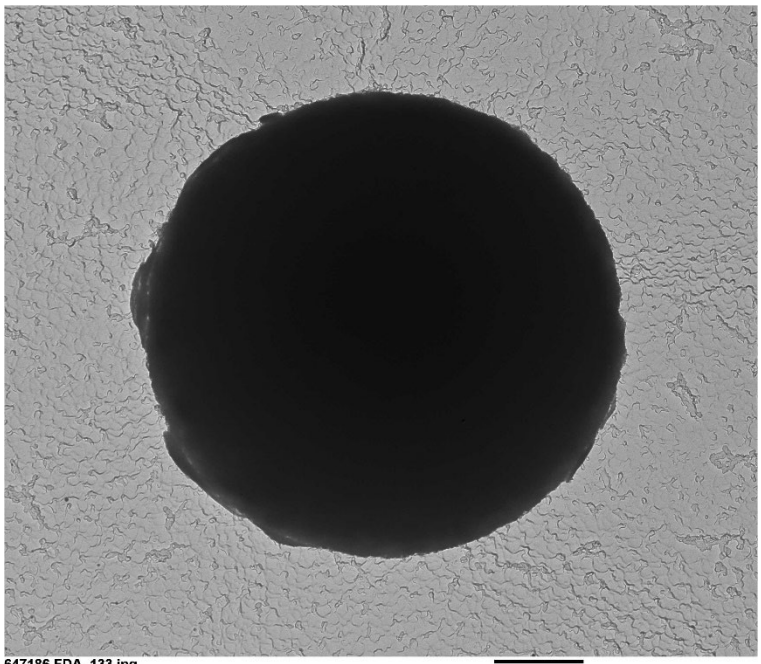
636185-12, Elongated Iron Particle



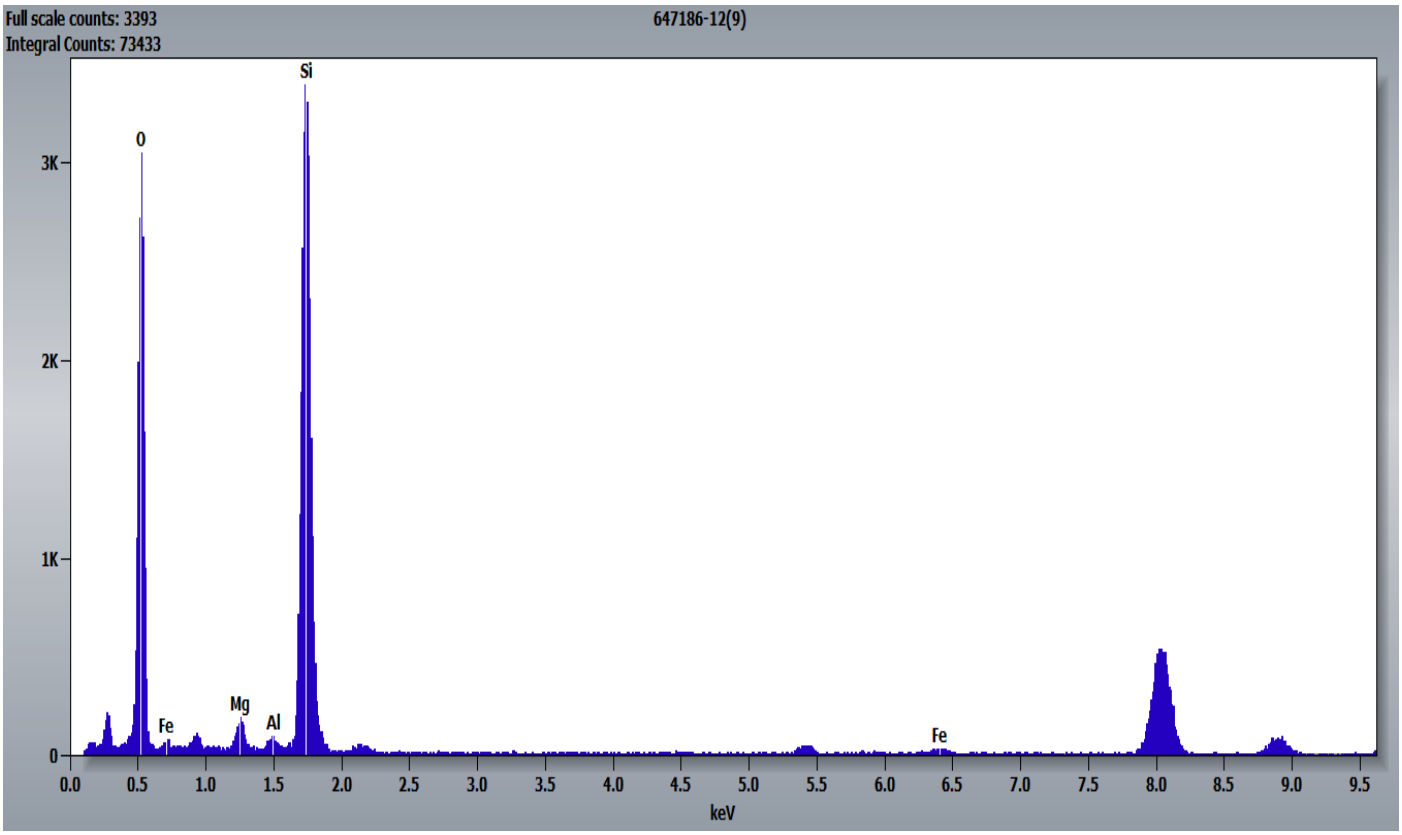
Chemistry from the Elongated Iron Particle Pictured Above



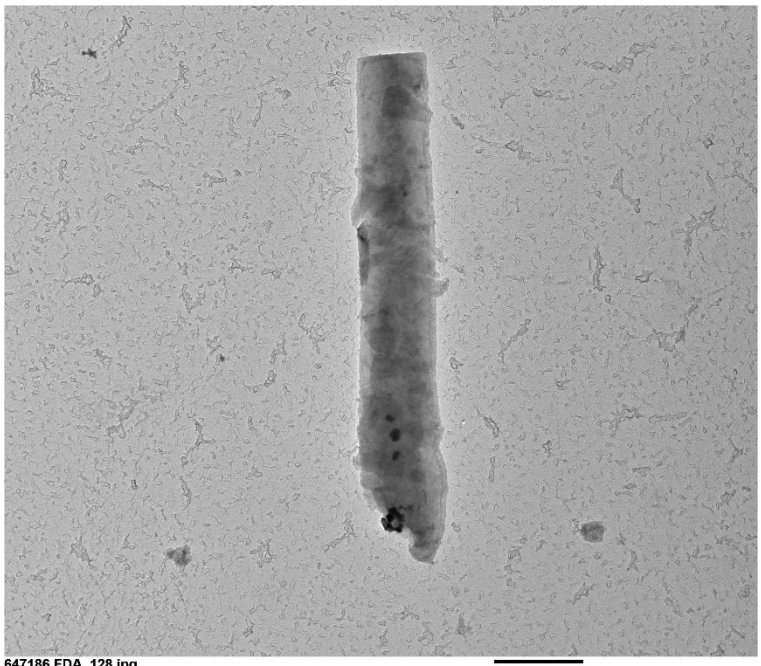
636185-12, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



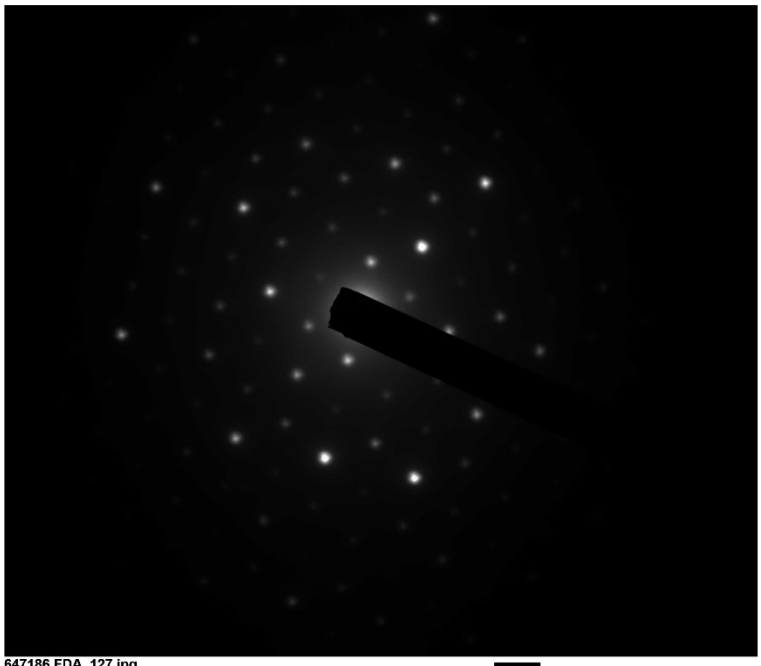
636185-12, Talc Fiber



647186 FDA_128.jpg
647186-12
Talc Fiber
FDA
Cal: 0.003183 µm/pix
14:53 2023-08-28
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 3000 x

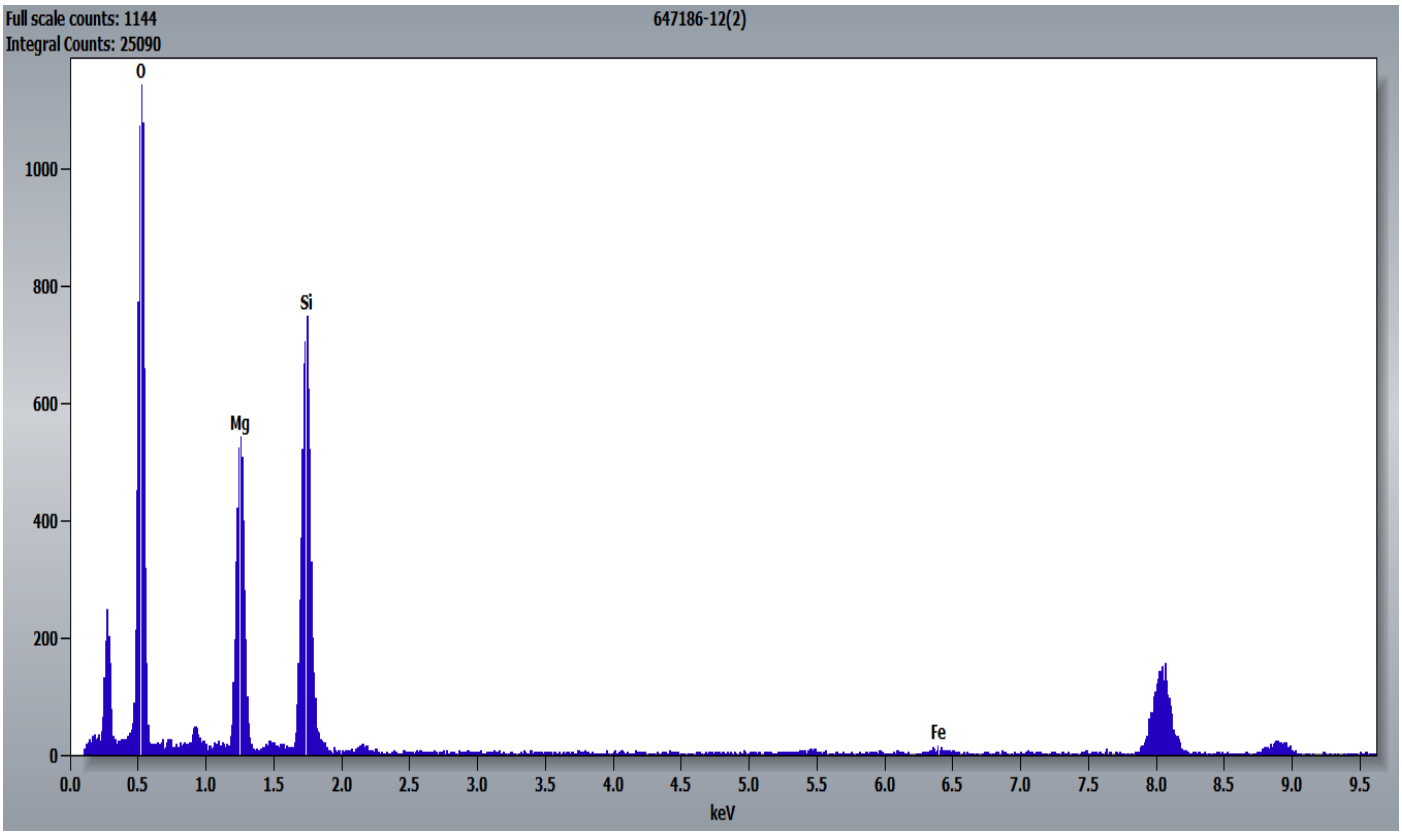
Hexagonal Diffraction Pattern from the Talc Fiber Pictured Above



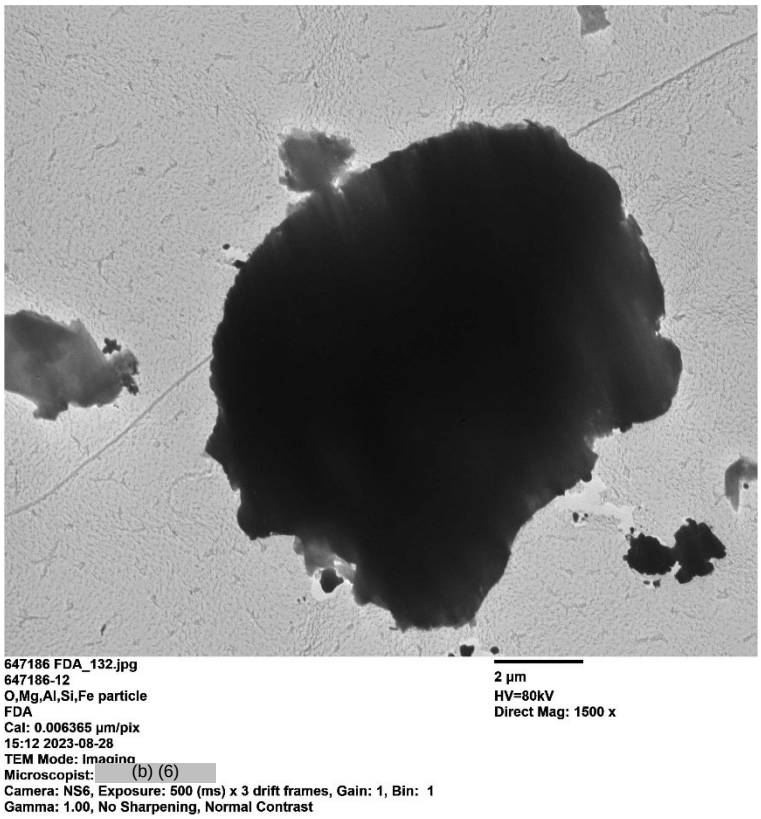
647186 FDA_127.jpg
647186-12
Talc Fiber
FDA
Cal: 0.003819 µm/pix
14:51 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

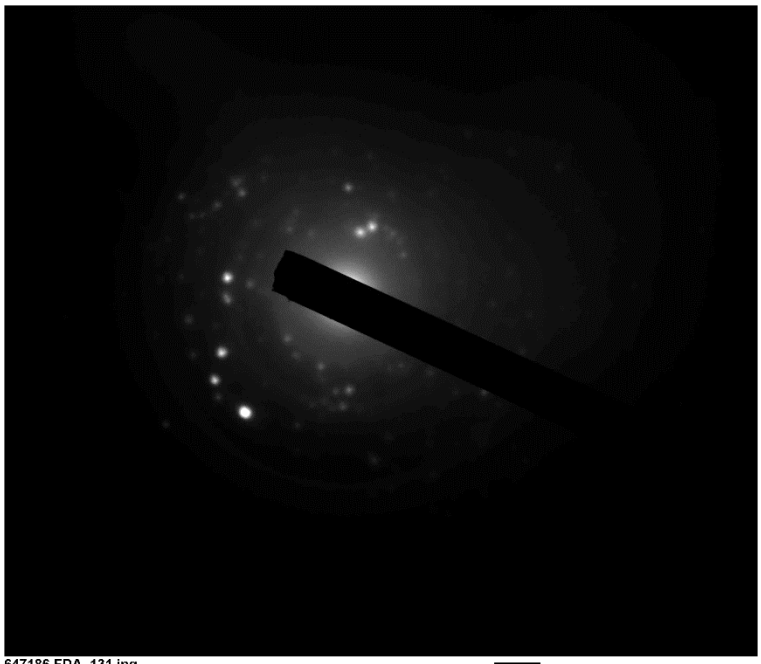
Chemistry from the Talc Fiber Pictured Above



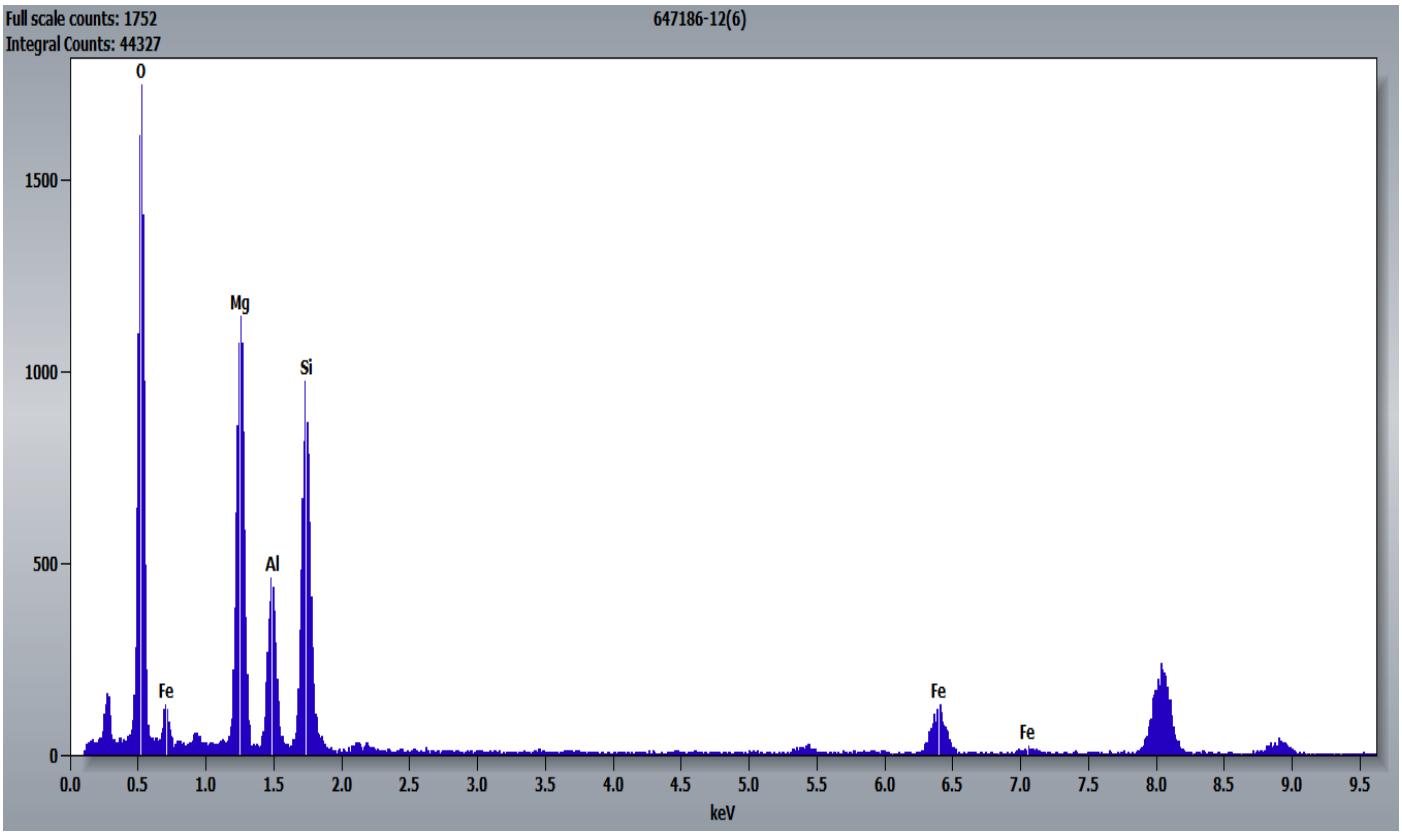
636185-12, Particle Containing Magnesium, Aluminum, and Silicon



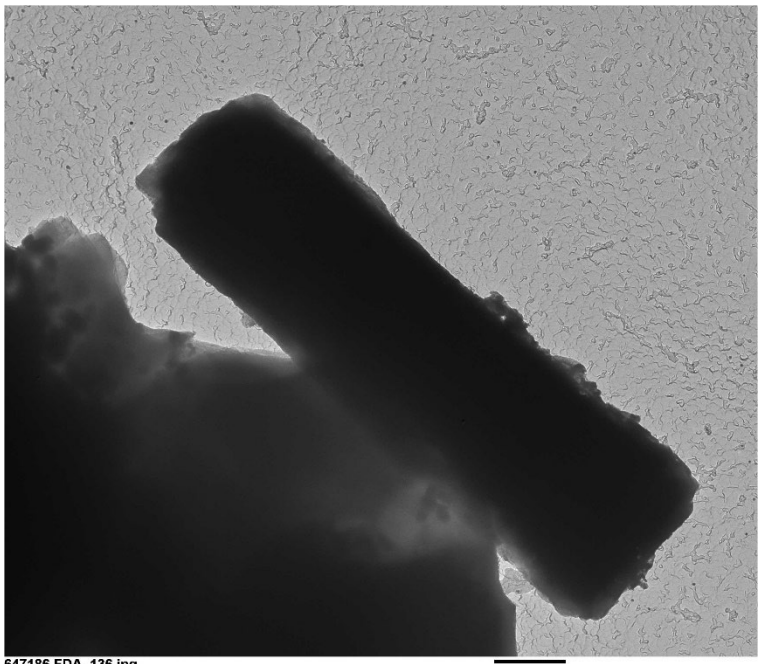
Diffraction Pattern from the Particle Containing Magnesium, Aluminum, and Silicon Pictured Above



Chemistry from the Particle Containing Particle Containing Magnesium, Aluminum, and Silicon Pictured Above



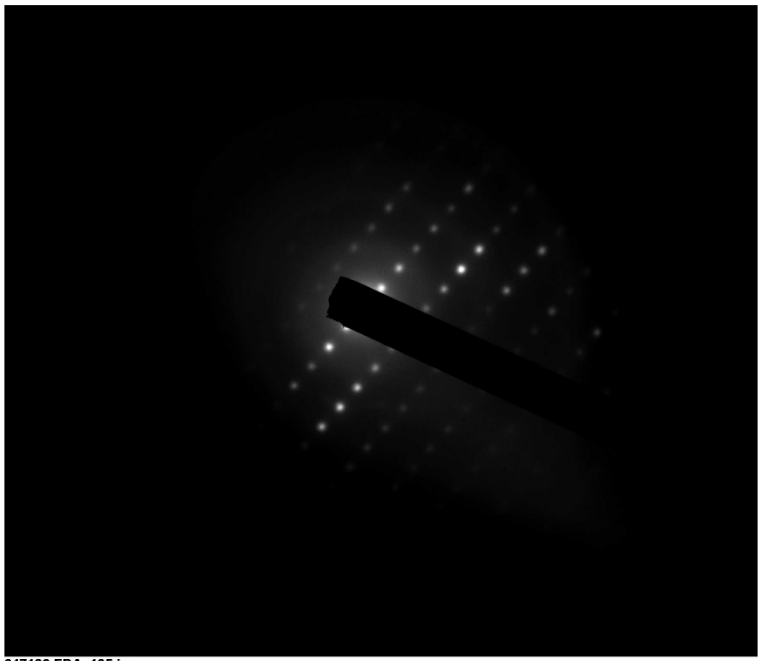
636185-12, Actinolite Particle



647186 FDA_136.jpg
647186-12
Actinolite
FDA
Cal: 0.002387 µm/pix
15:35 2023-08-28
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

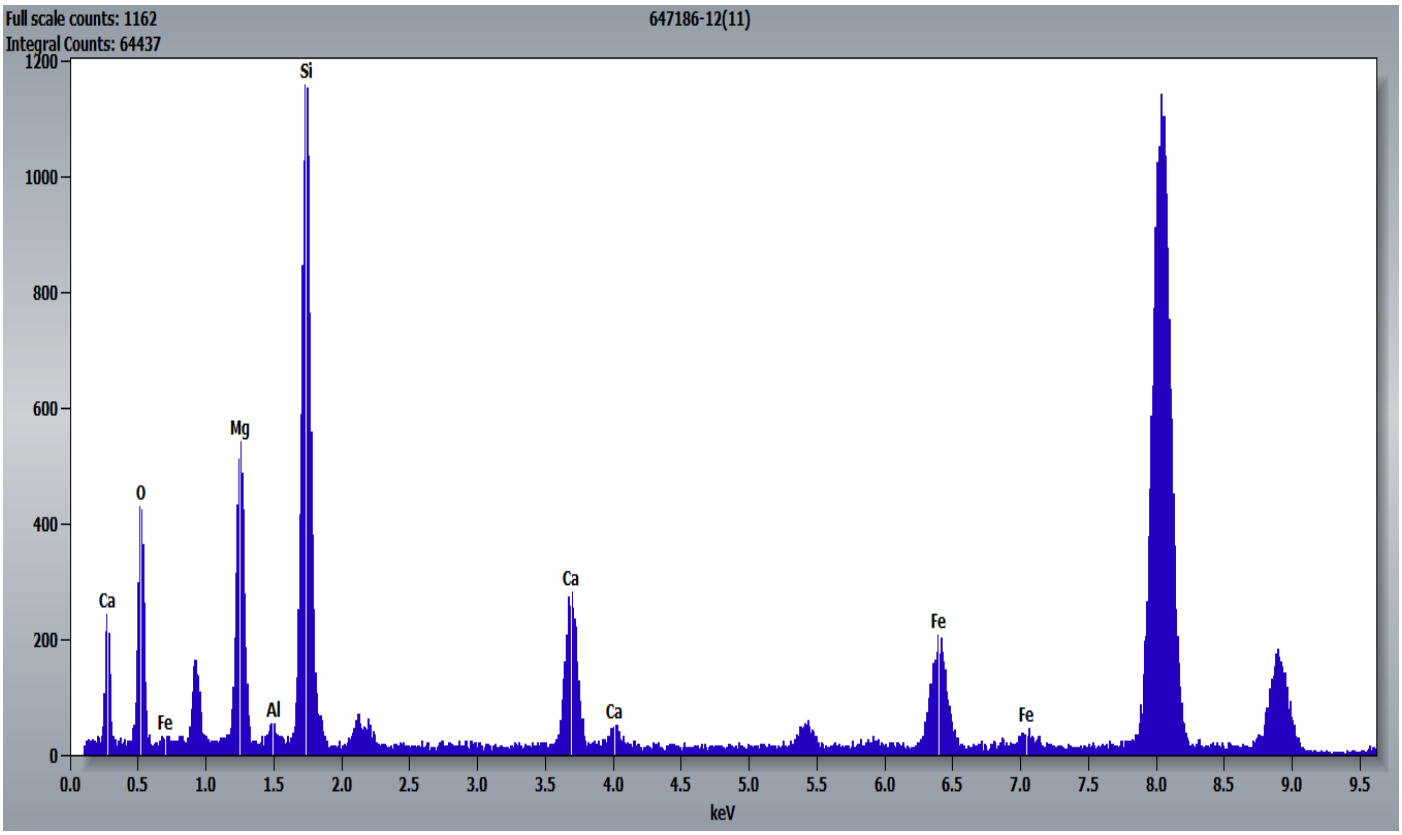
Diffraction Pattern from the Actinolite Particle Pictured Above



647186 FDA_135.jpg
647186-12
Actinolite
FDA
Cal: 0.000477 µm/pix
15:34 2023-08-28
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Actinolite Particle Pictured Above



647186-13, 13A, 13B/Client Sample: 05162023-13

PLM

All three aliquots of sample 05162023-13 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-13	No Asbestos Detected
647186-13A	No Asbestos Detected
647186-13B	No Asbestos Detected

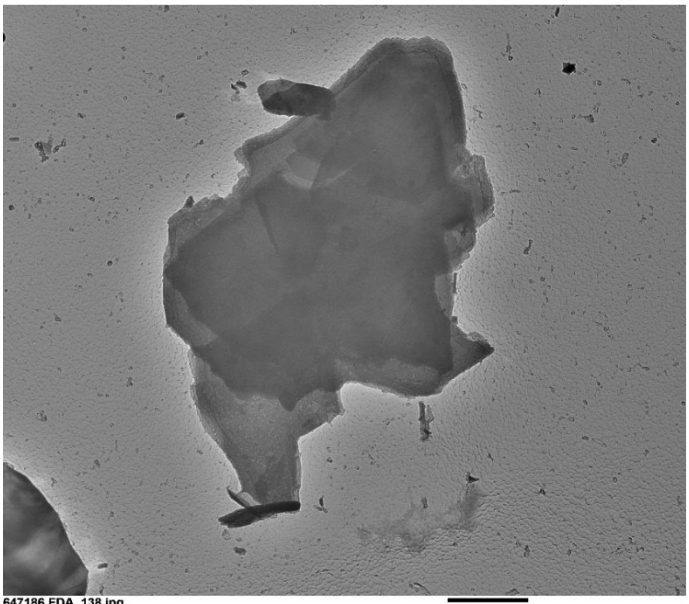
TEM

(b) (6) analyzed aliquot 13 on August 29, 2023. (b) (6) analyzed aliquot 13A on August 28, 2023, and (b) (6) analyzed aliquot 13B on August 28, 2023. The primary particle observed was talc; mica and titanium particles were also observed along with silica spheres, iron particles, and talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

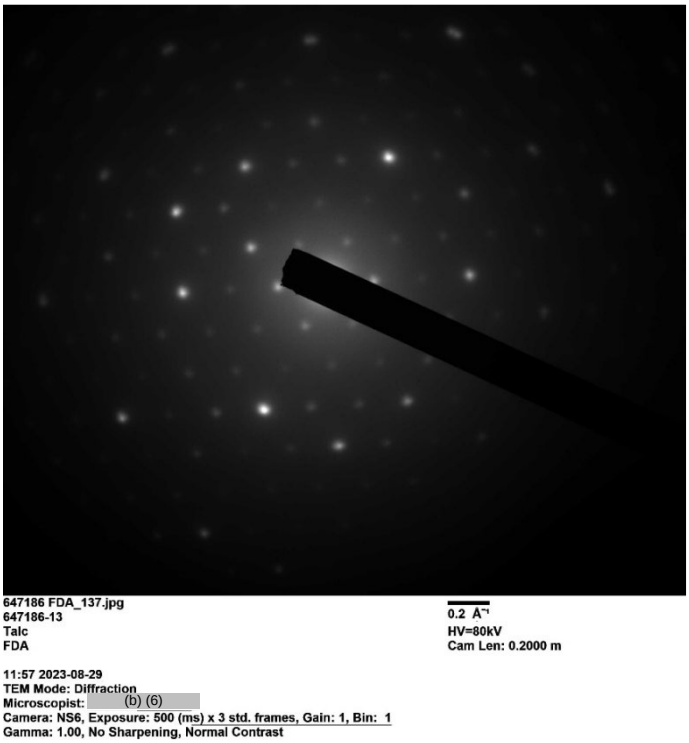
647186-13	No Asbestos Detected
647186-13A	No Asbestos Detected
647186-13B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

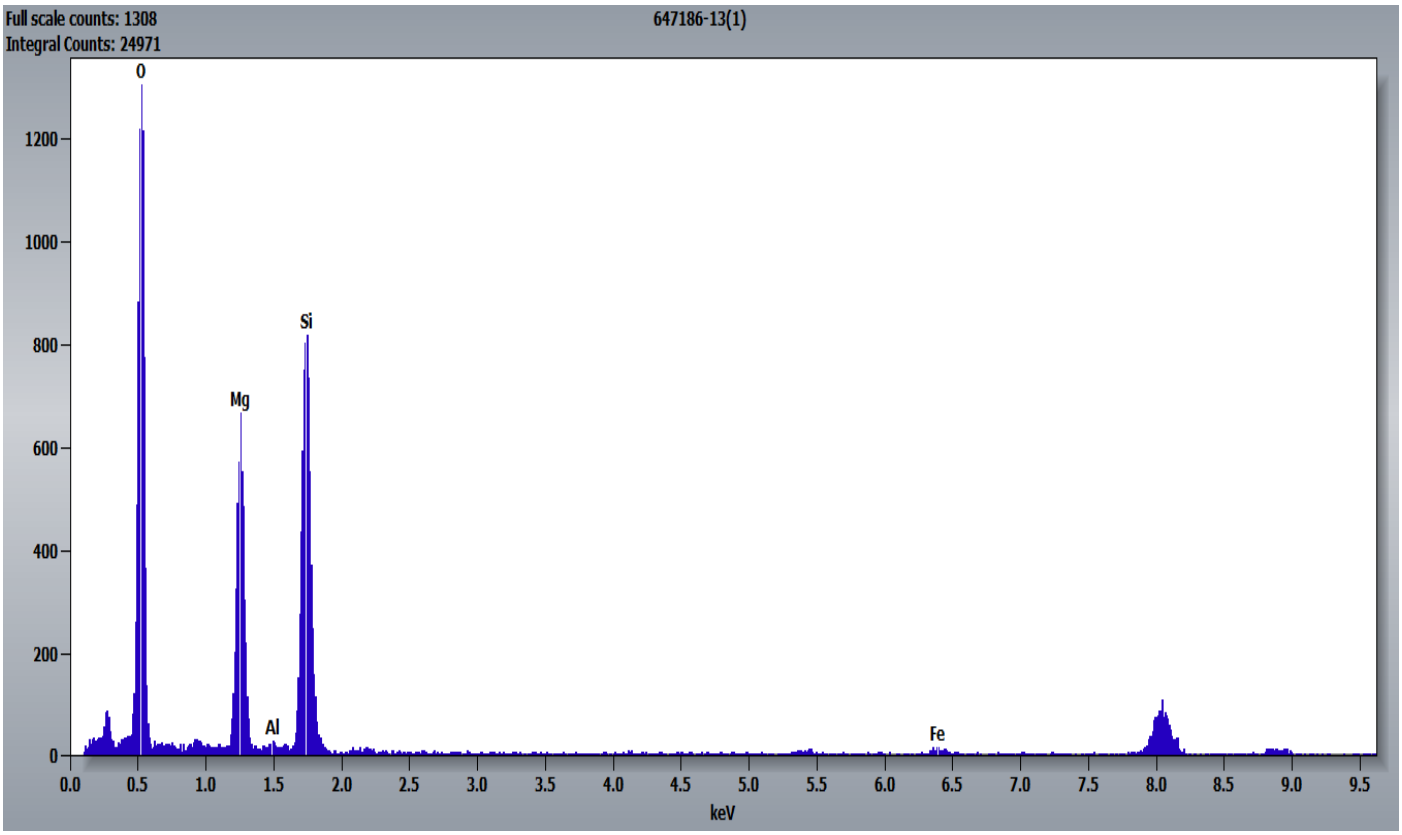
647186-13, Talc Particle



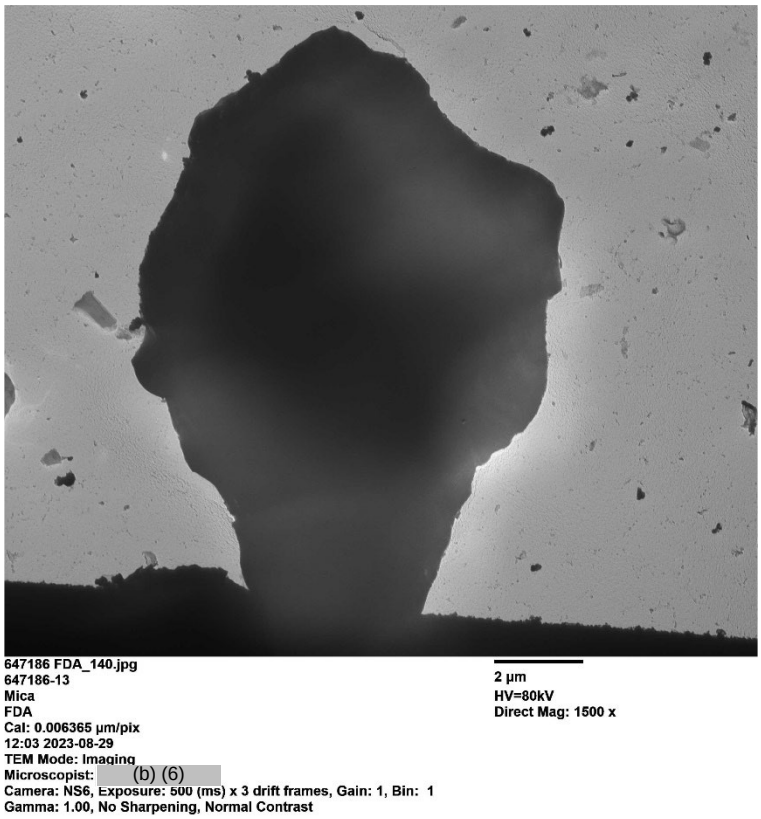
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



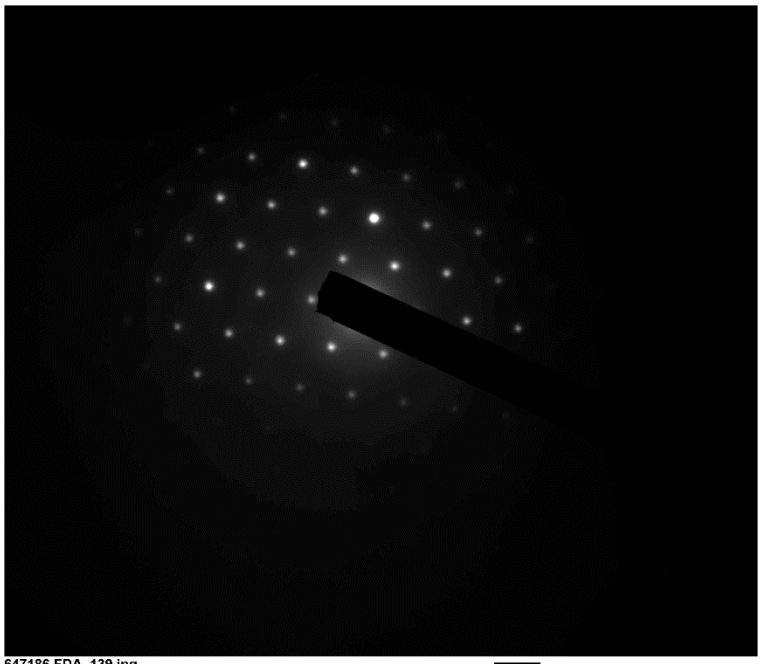
Chemistry from the Talc Particle Pictured Above



647186-13, Mica Particle



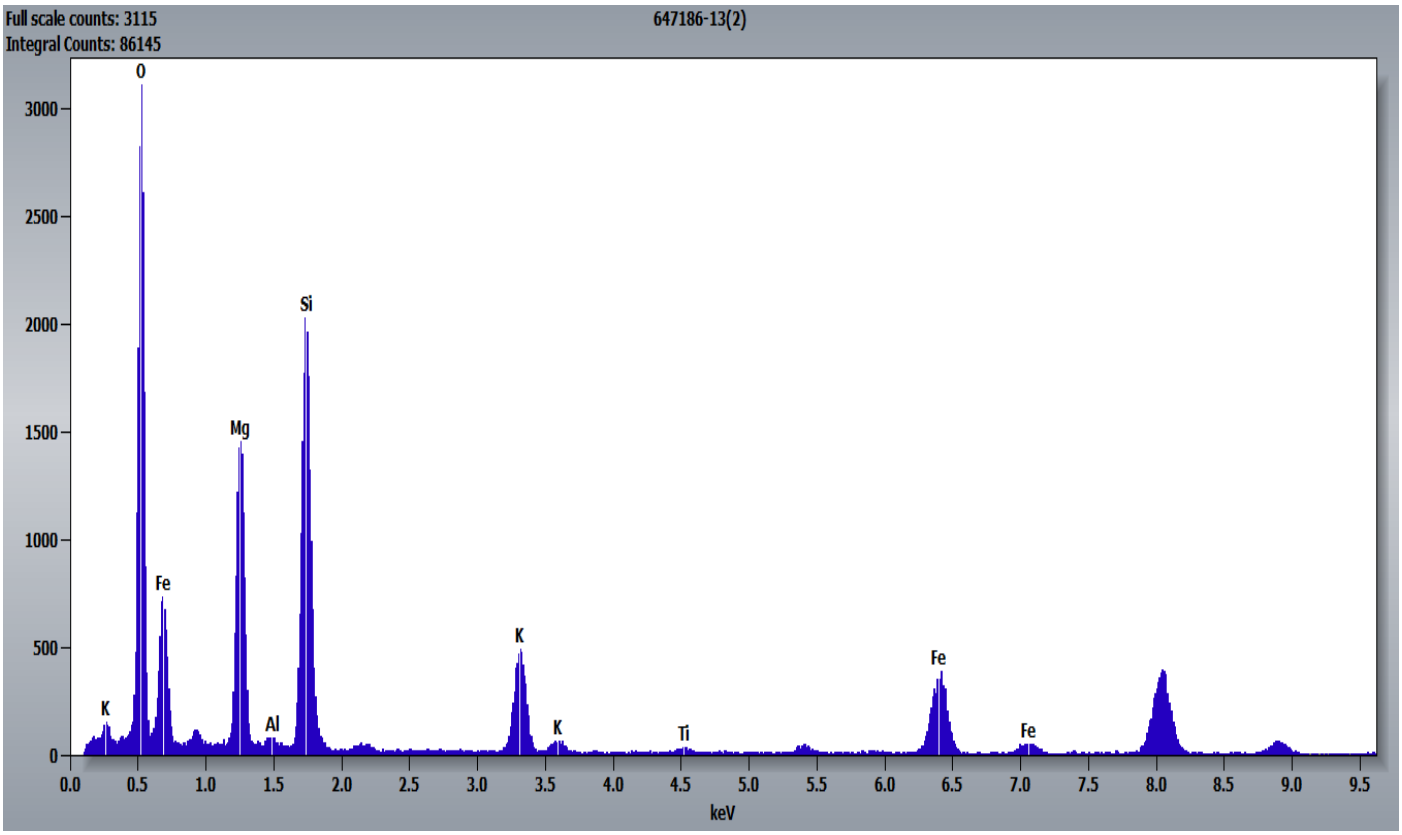
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above



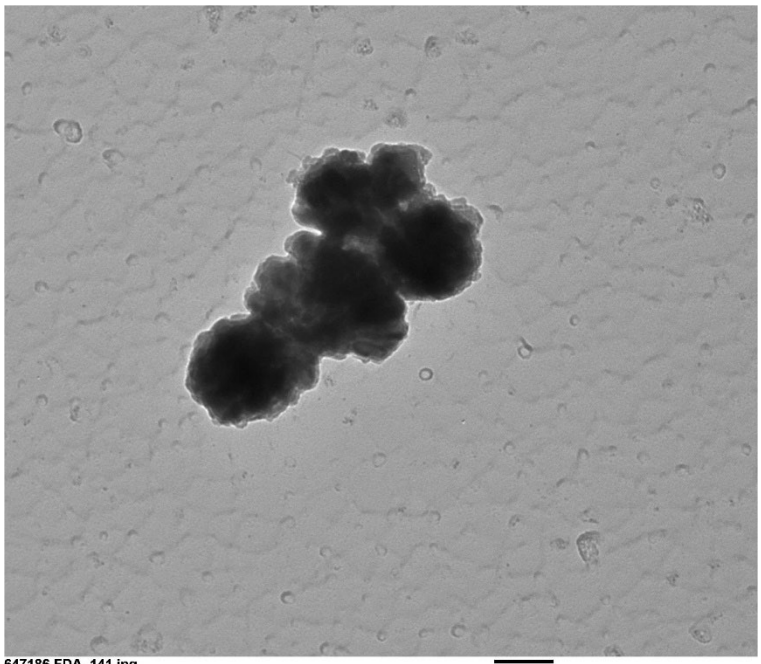
647186 FDA_139.jpg
647186-13
Mica
FDA
Cal: 0.003183 µm/pix
12:01 2023-08-29
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 A^{-1}
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Mica Particle Pictured Above



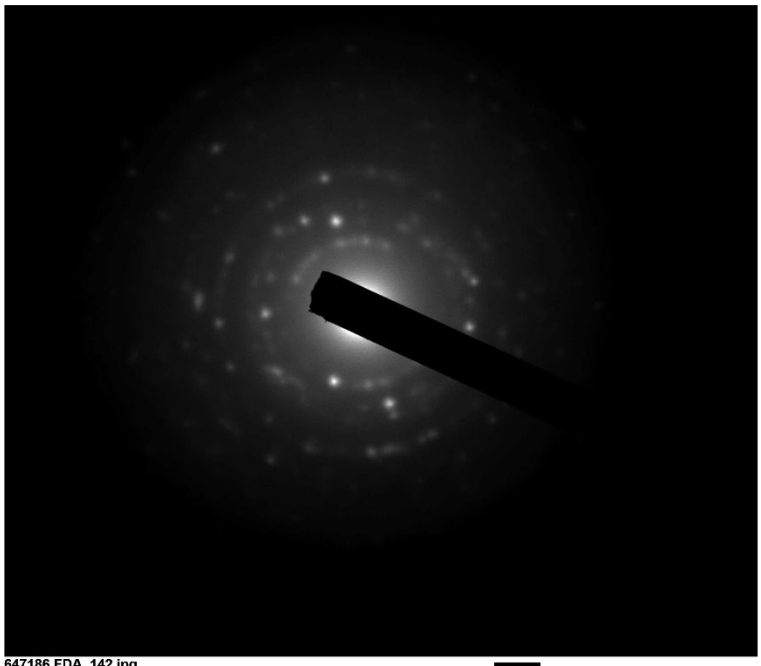
647186-13, Titanium Particles



647186 FDA_141.jpg
647186-13
Ti particles
FDA
Cal: 0.000477 µm/pix
12:06 2023-08-29
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 nm
HV=80kV
Direct Mag: 20000 x

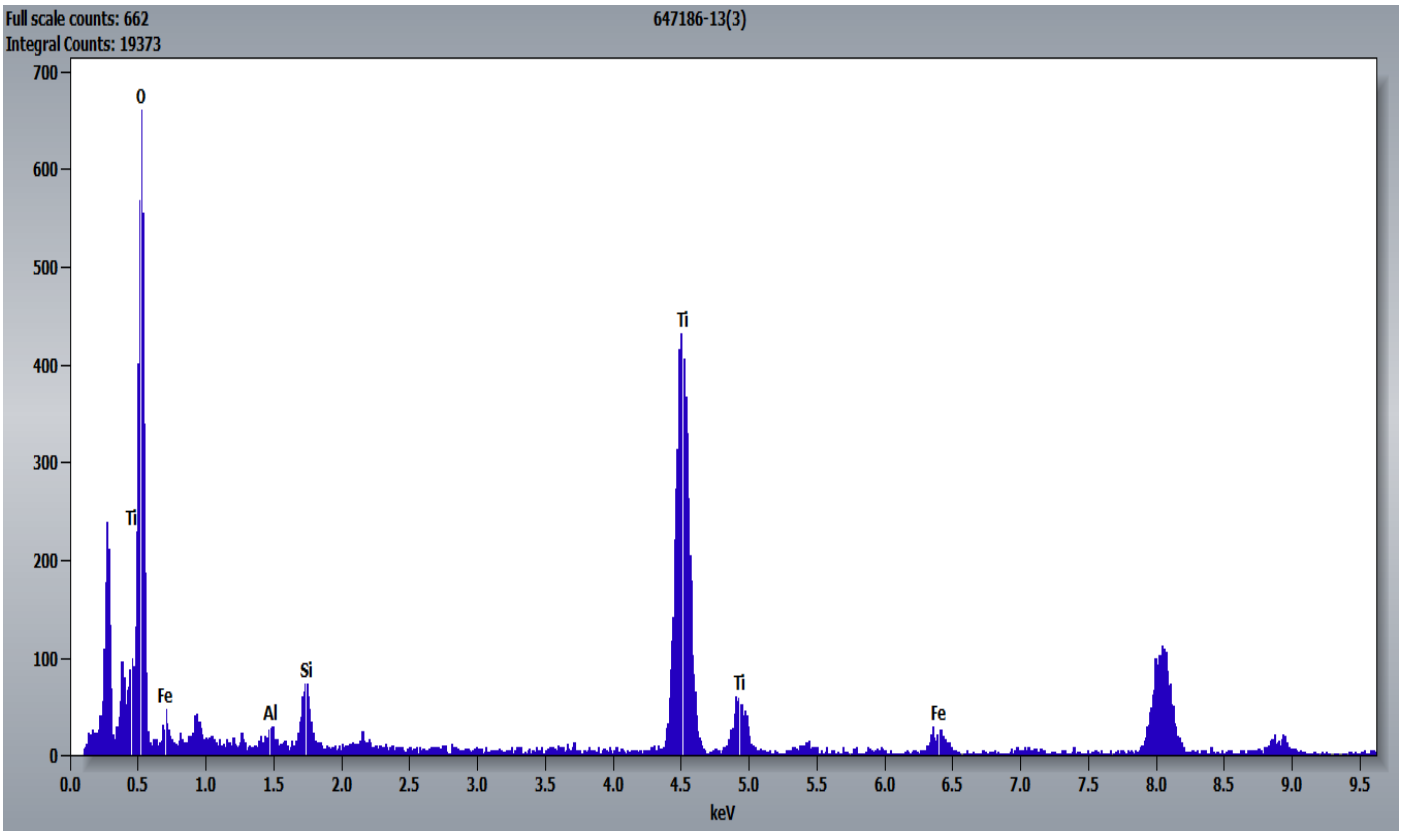
Diffraction Pattern from the Titanium Particles Pictured Above



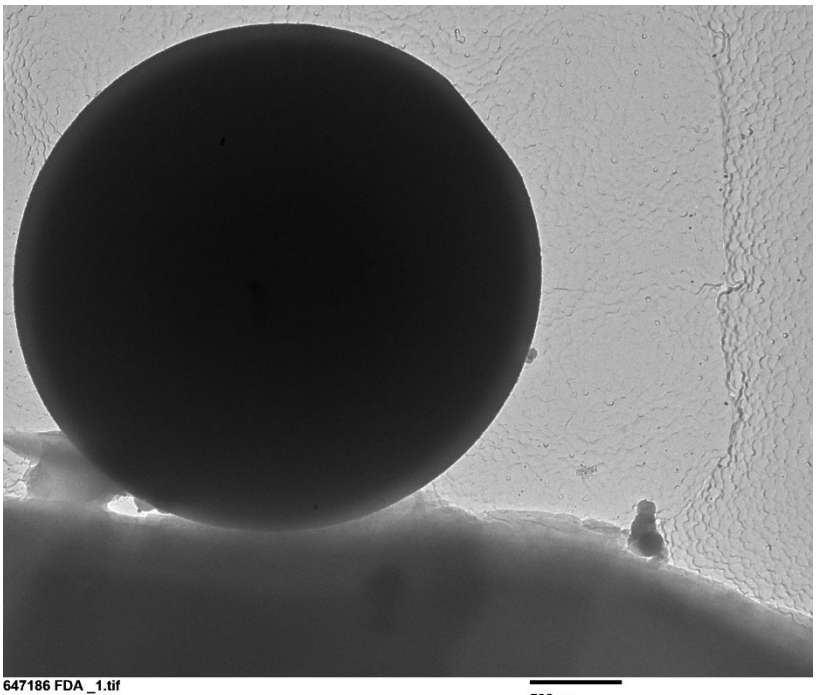
647186 FDA_142.jpg
647186-13
Ti particles
FDA
Cal: 0.000477 µm/pix
12:07 2023-08-29
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

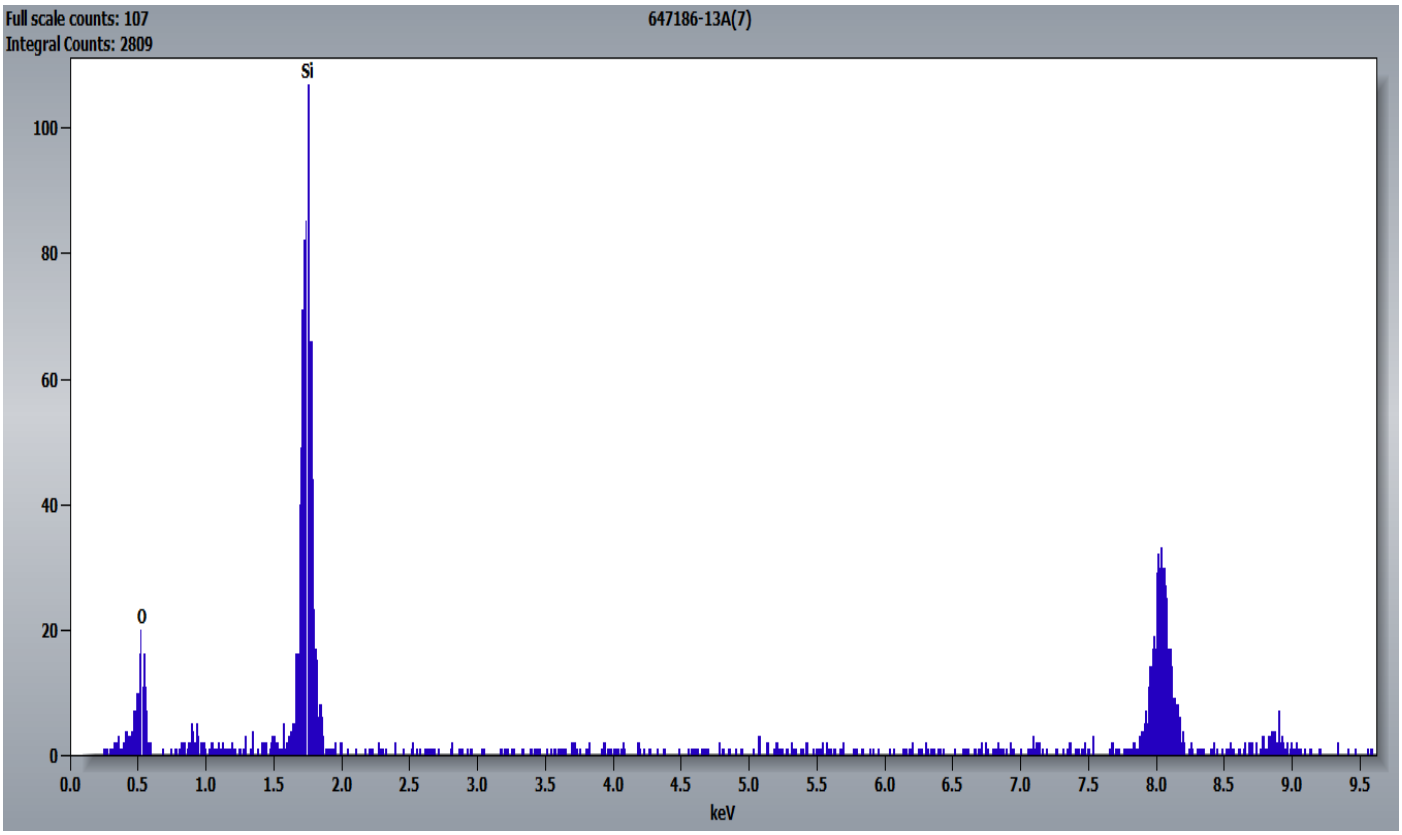
Chemistry from the Titanium Particles Pictured Above



647186-13A, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-14, 14A, 14B/Client Sample: 05162023-14

PLM

All three aliquots of sample 05162023-14 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-14	No Asbestos Detected
647186-14A	No Asbestos Detected
647186-14B	No Asbestos Detected

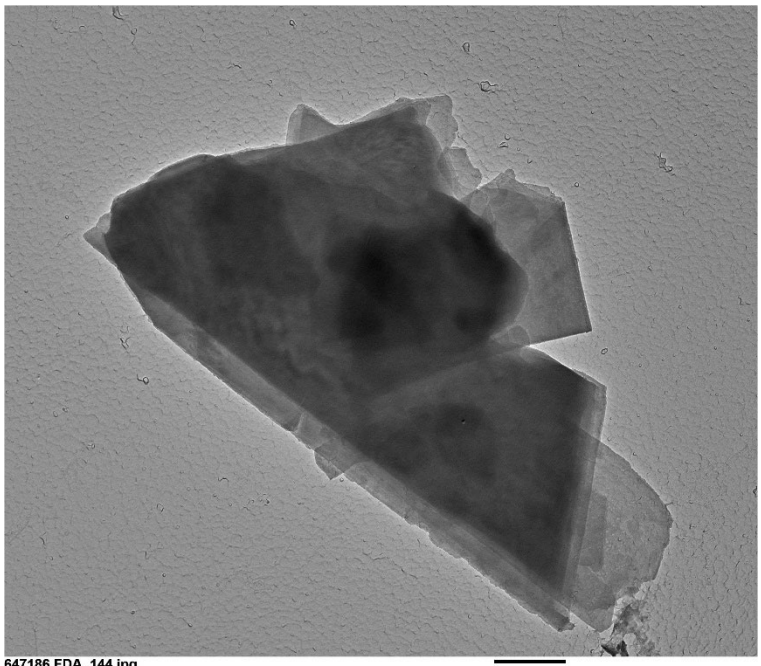
TEM

(b) (6) analyzed aliquot 14 on August 29, 2023. (b) (6) analyzed aliquot 14A on August 28, 2023, and aliquot 14B on August 29, 2023. The primary particle observed was talc; talc ribbons/fibers were also observed along with titanium particles and silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-14	No Asbestos Detected
647186-14A	No Asbestos Detected
647186-14B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

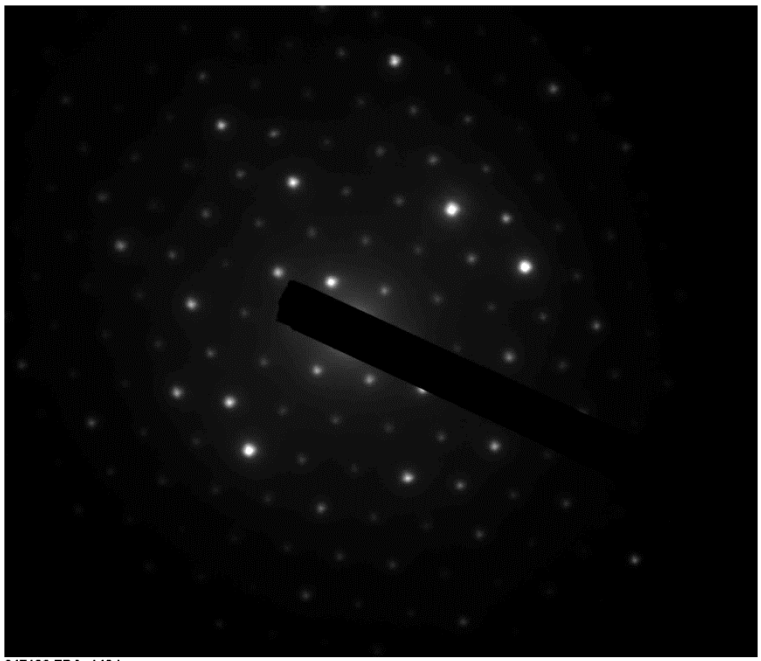
647186-14, Talc Particle



647186 FDA_144.jpg
647186-14
Talc
FDA
Cal: 0.002387 µm/pix
14:53 2023-08-29
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

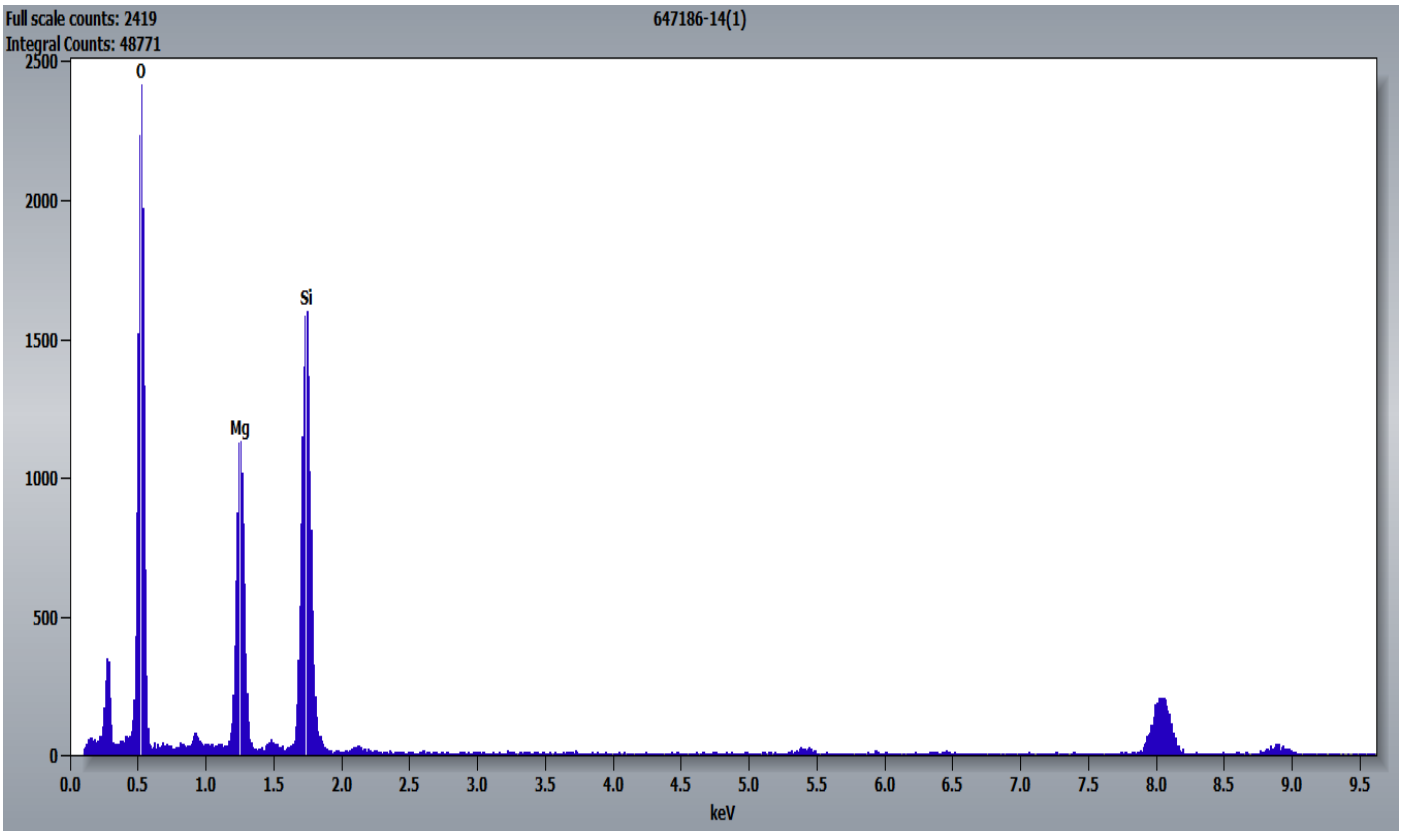


647186 FDA_143.jpg
647186-14
Talc
FDA

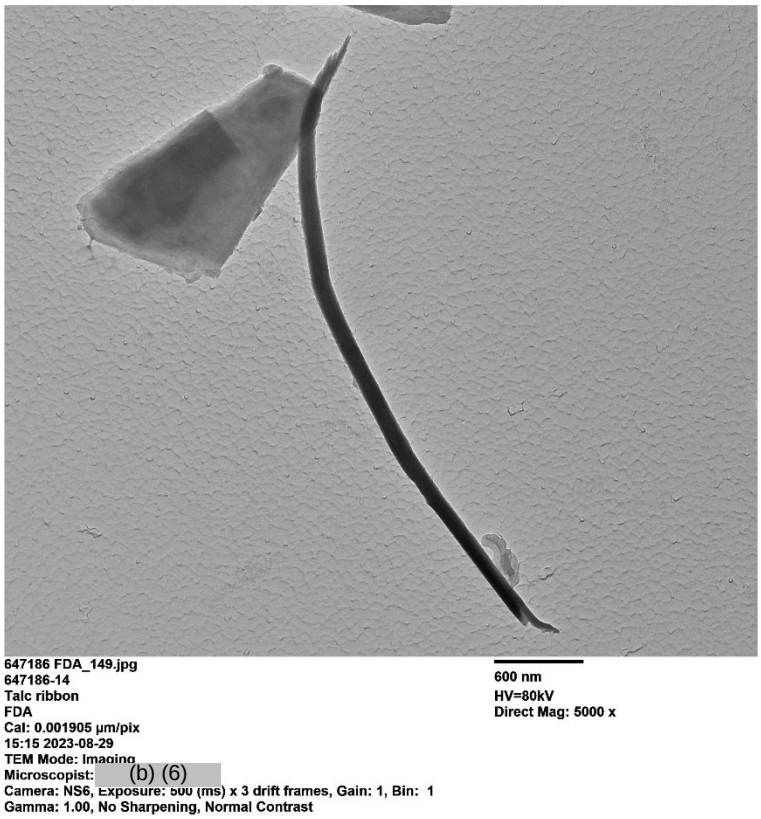
14:49 2023-08-29
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

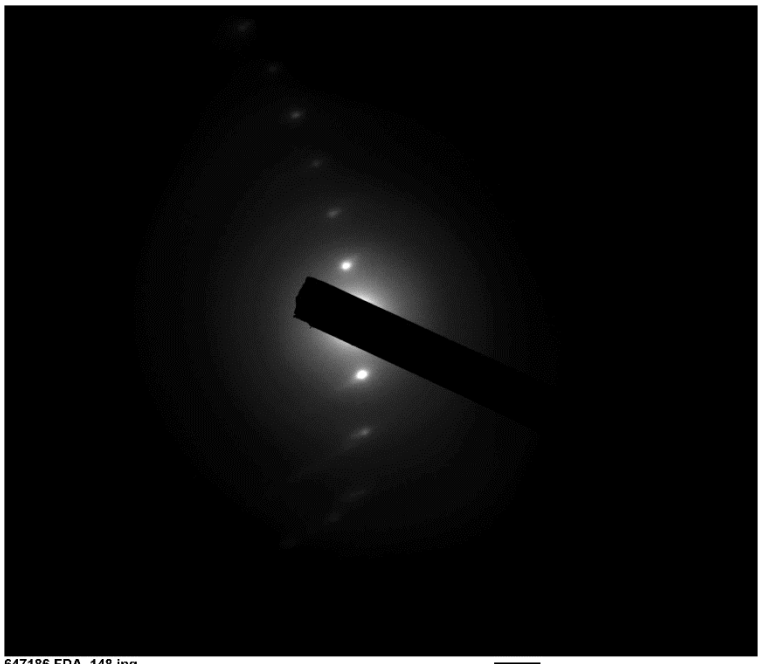
Chemistry from the Talc Particle Pictured Above



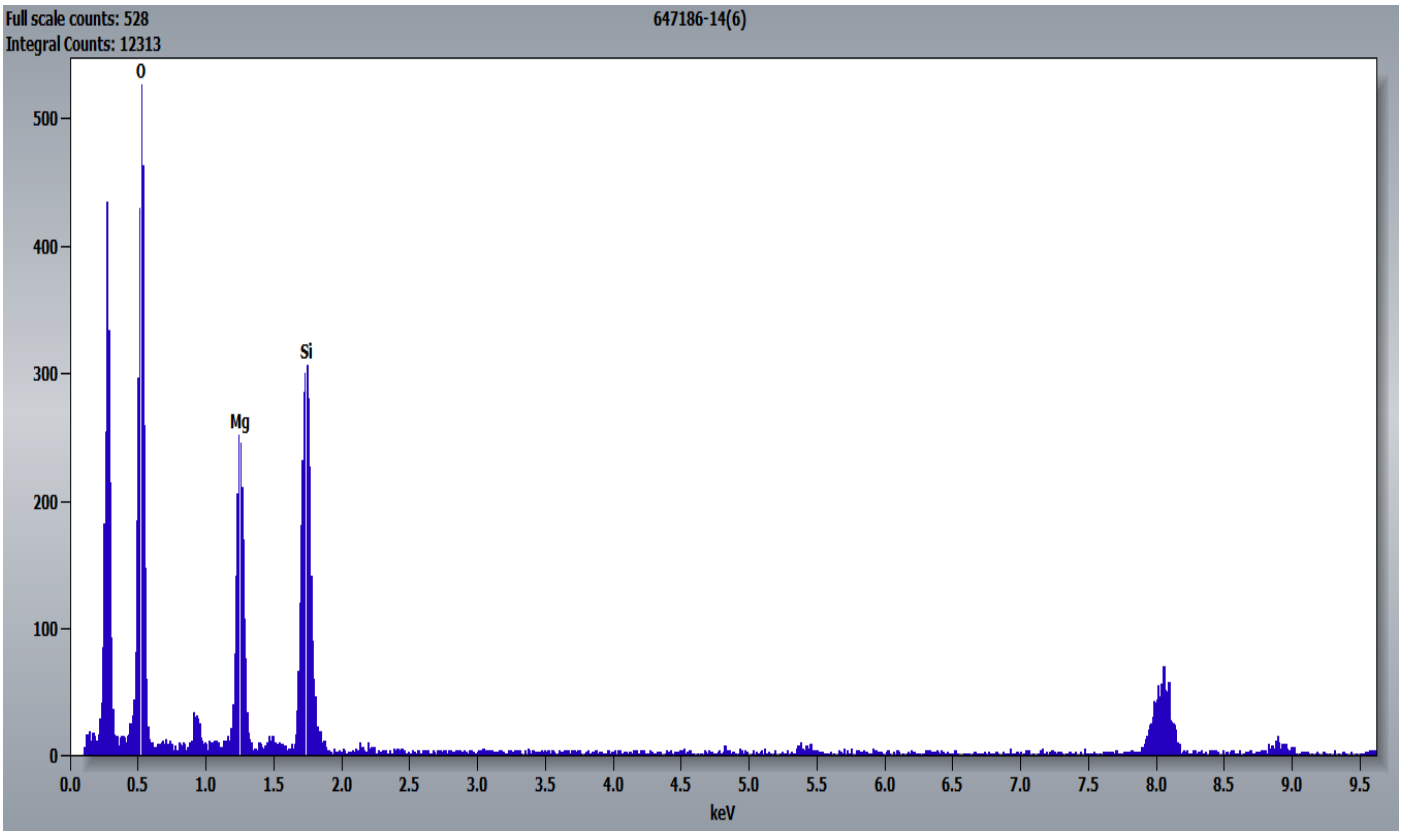
647186-14, Talc Ribbon



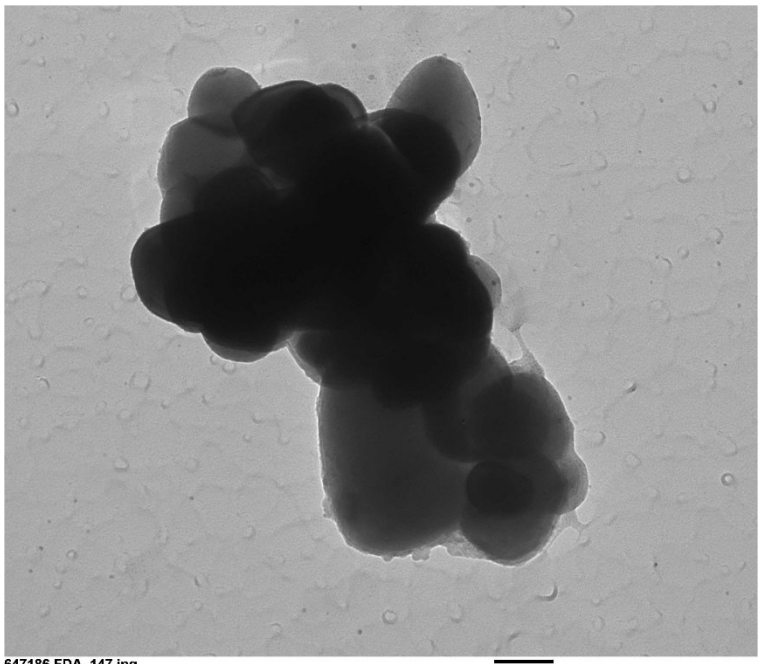
Diffraction Pattern from the Talc Ribbon Pictured Above



Chemistry from the Talc Ribbon Pictured Above



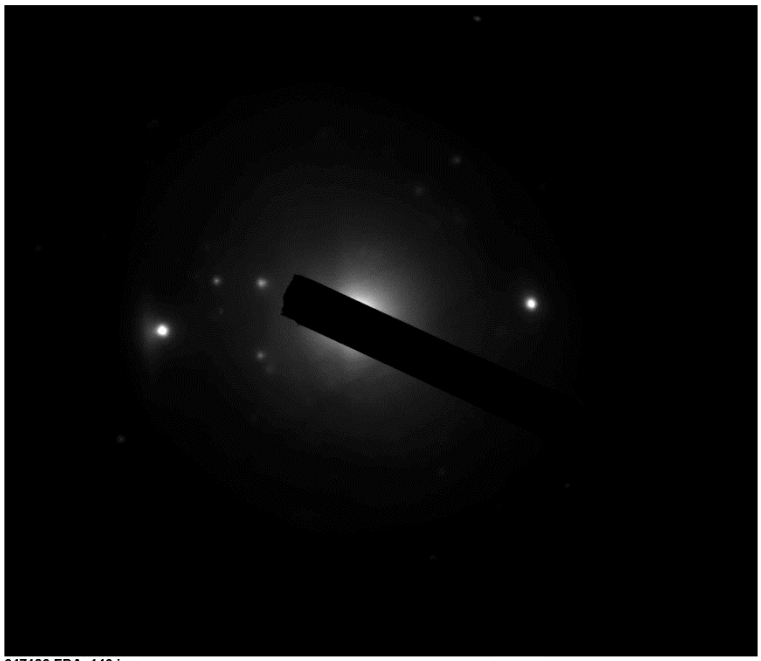
647186-14, Titanium Particles



647186 FDA_147.jpg
647186-14
Ti particles
FDA
Cal: 0.000477 µm/pix
15:07 2023-08-29
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 nm
HV=80kV
Direct Mag: 20000 x

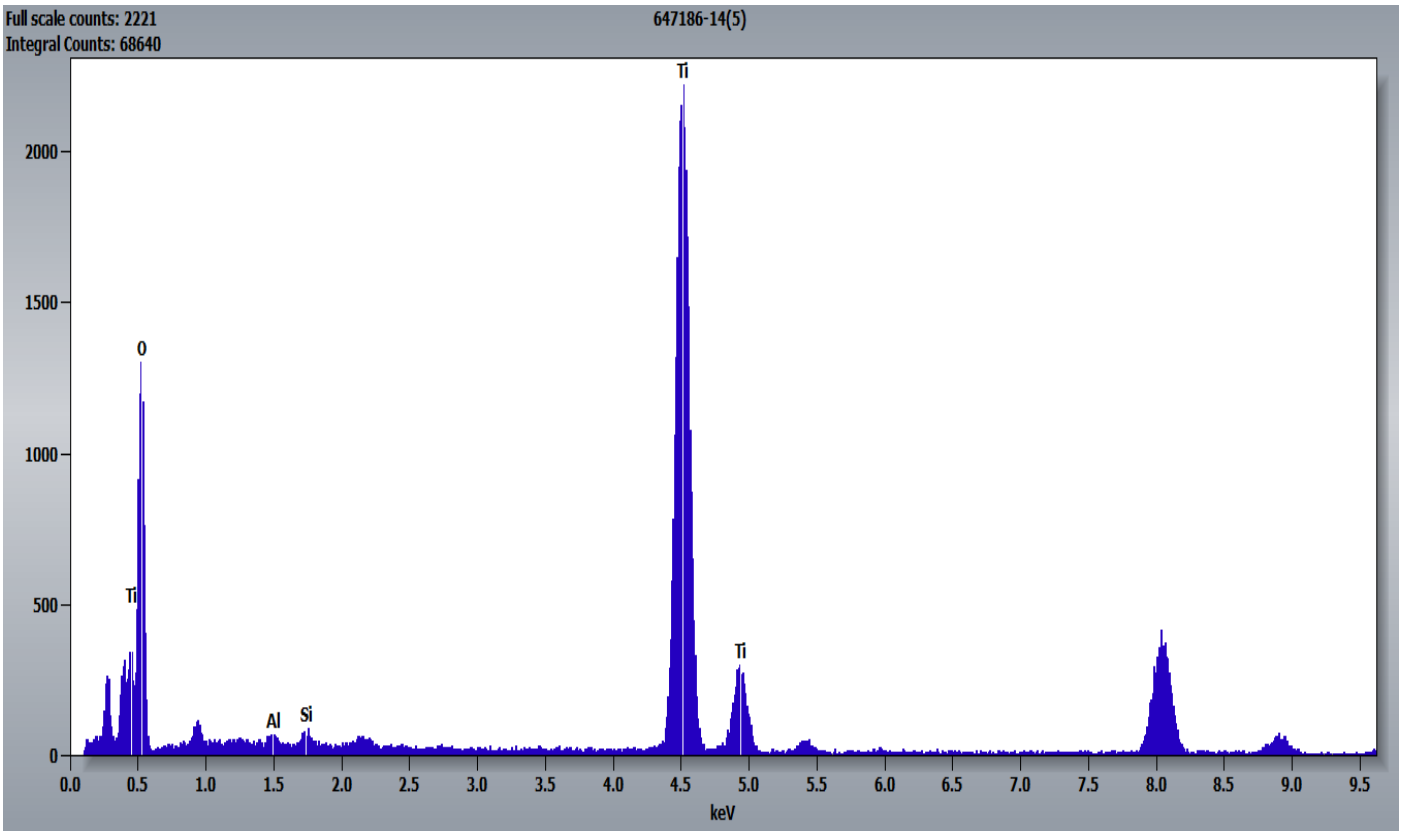
Diffraction Pattern from the Titanium Particles Pictured Above



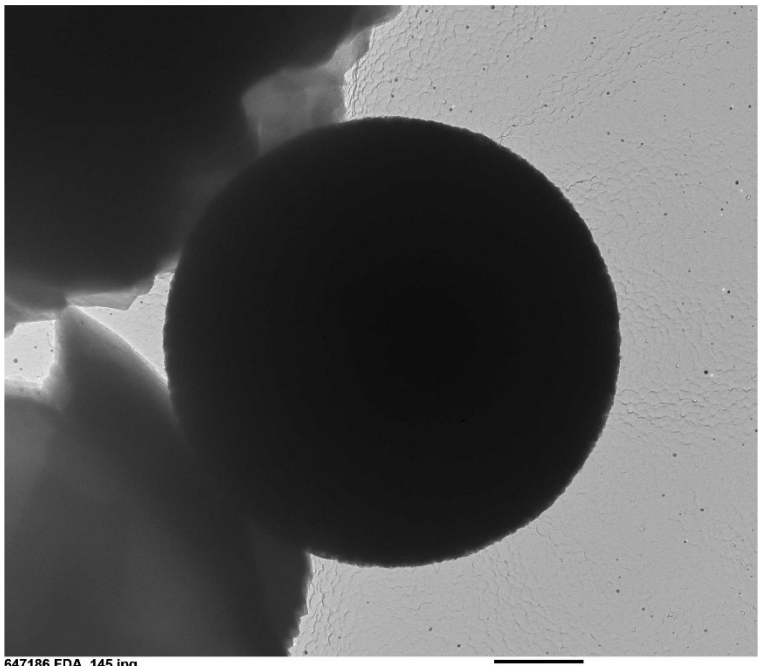
647186 FDA_146.jpg
647186-14
Ti particles
FDA
Cal: 0.001905 µm/pix
15:06 2023-08-29
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

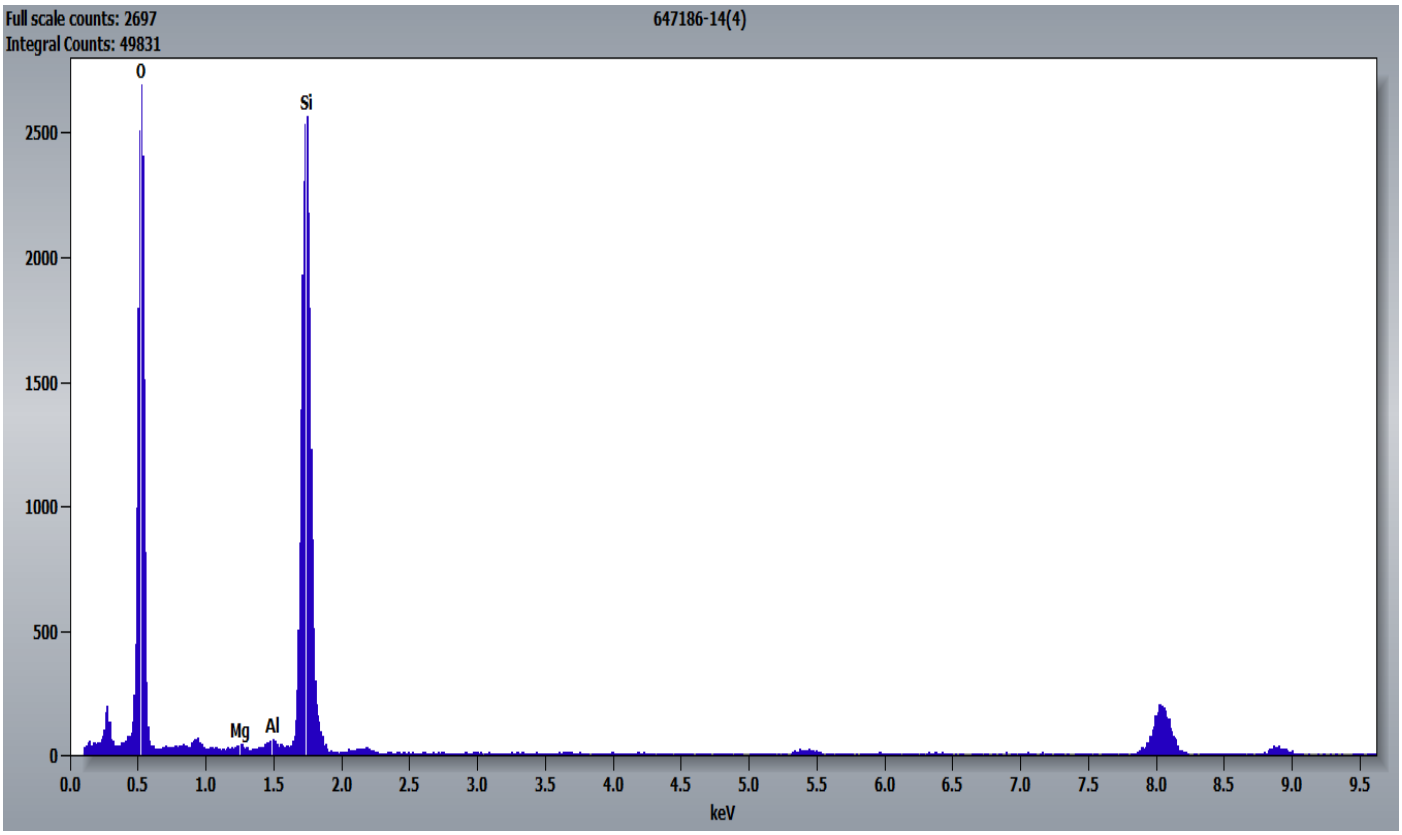
Chemistry from the Titanium Particles Pictured Above



647186-14, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-15, 15A, 15B/Client Sample: 05162023-15

PLM

All three aliquots of sample 05162023-15 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-15	No Asbestos Detected
647186-15A	No Asbestos Detected
647186-15B	No Asbestos Detected

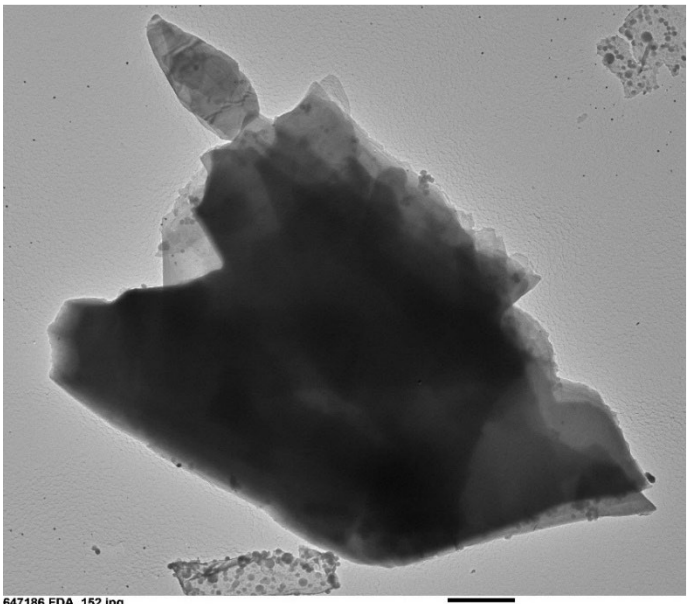
TEM

(b) (6) analyzed aliquot 15 on August 30, 2023. (b) (6) analyzed aliquots 15A and 15B on August 29, 2023. (b) (6) analyzed aliquot 15B on August 31, 2023. The primary particles observed were talc and mica; silicon particles were also observed along with silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

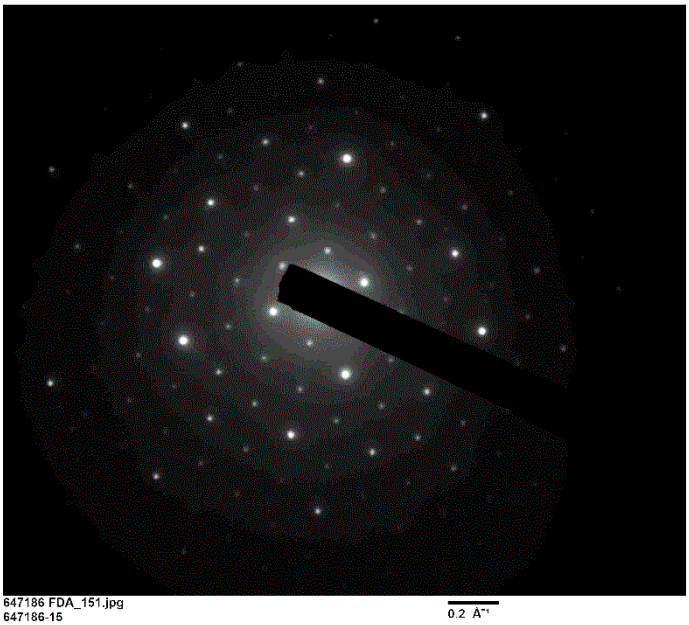
647186-15	No Asbestos Detected
647186-15A	No Asbestos Detected
647186-15B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

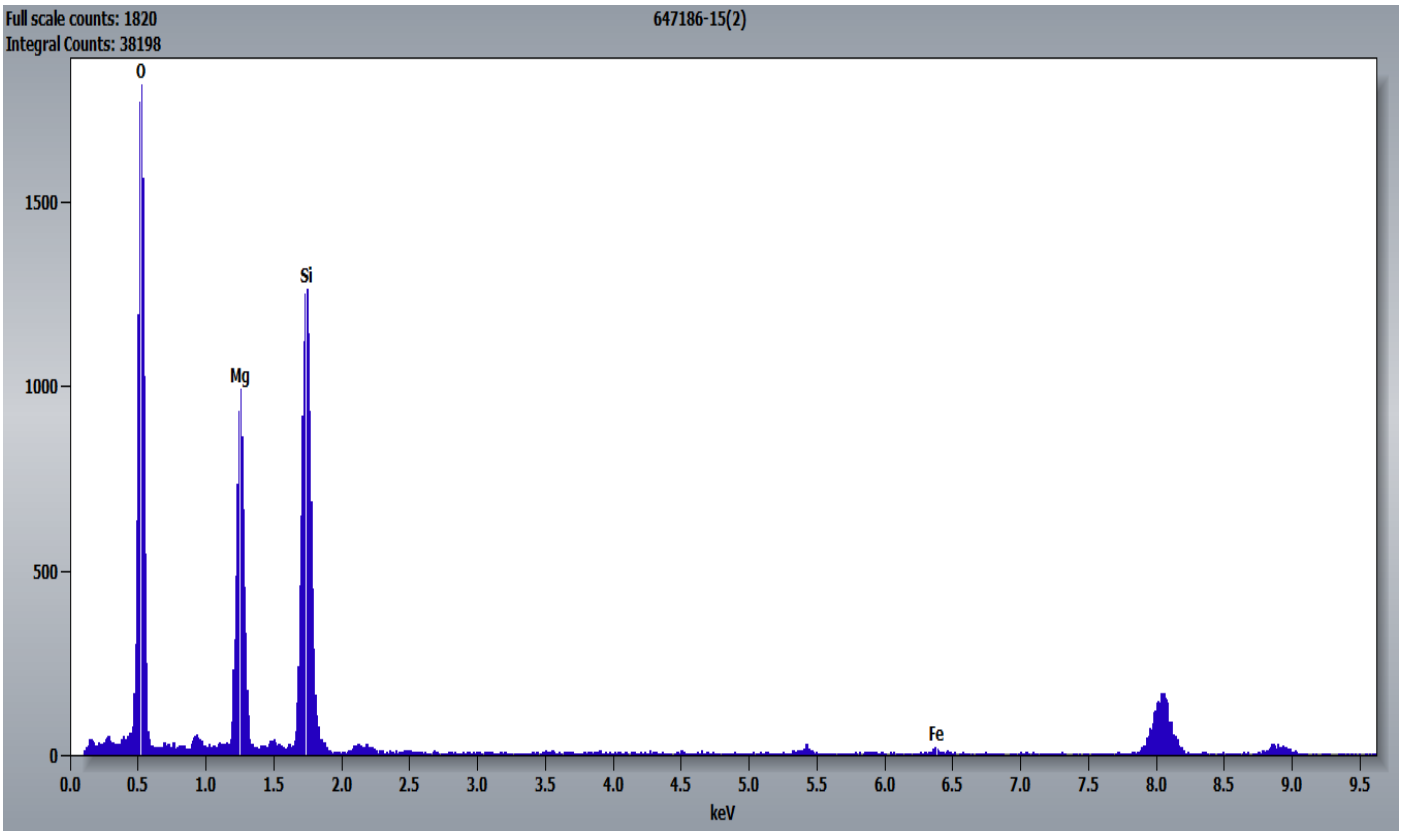
647186-15, Talc Particle



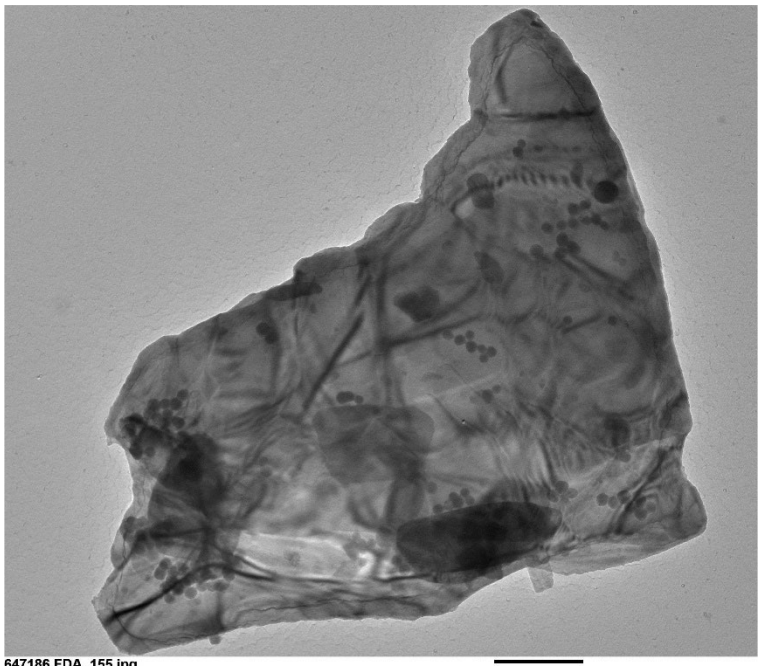
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



647186-15, Mica Particle

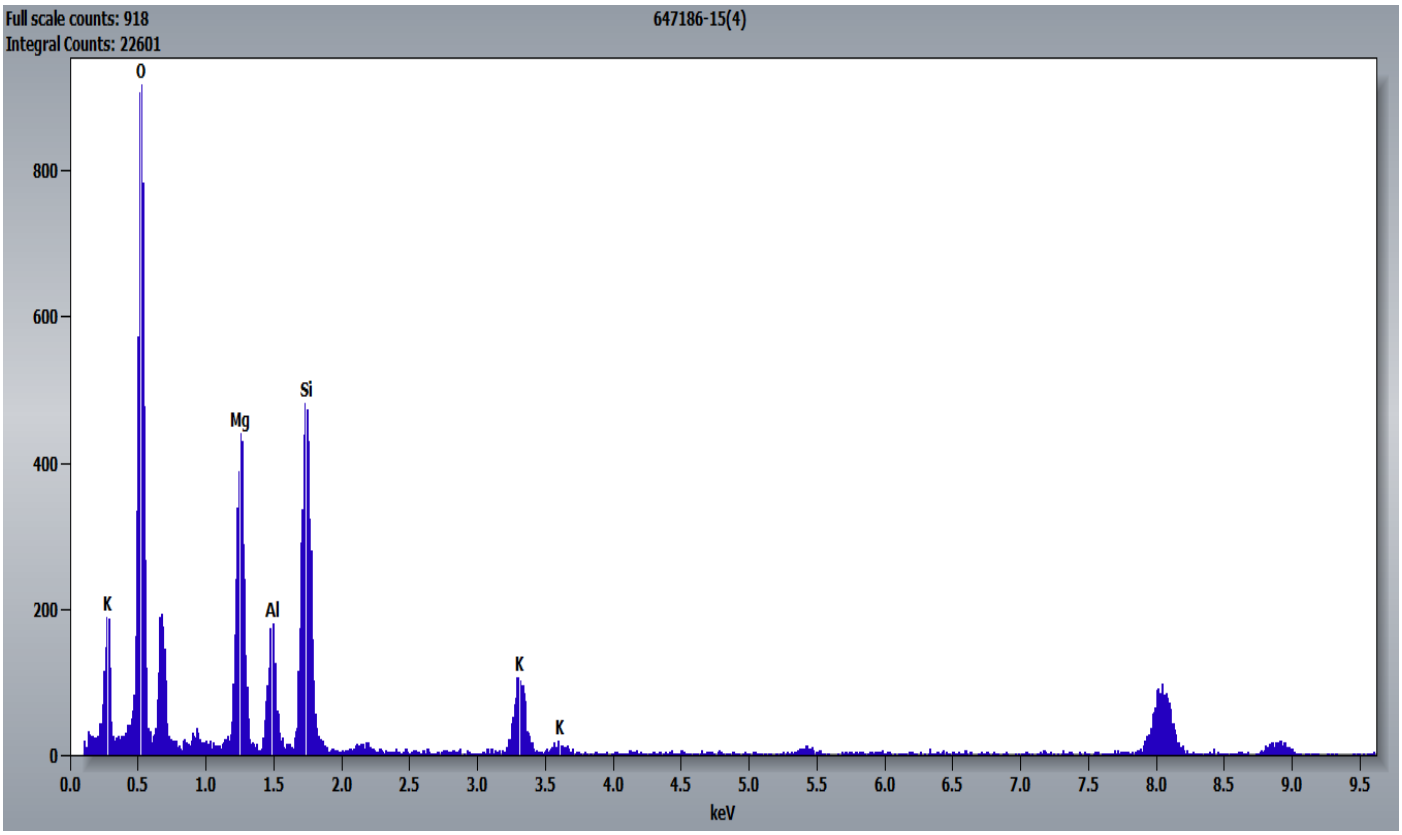


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

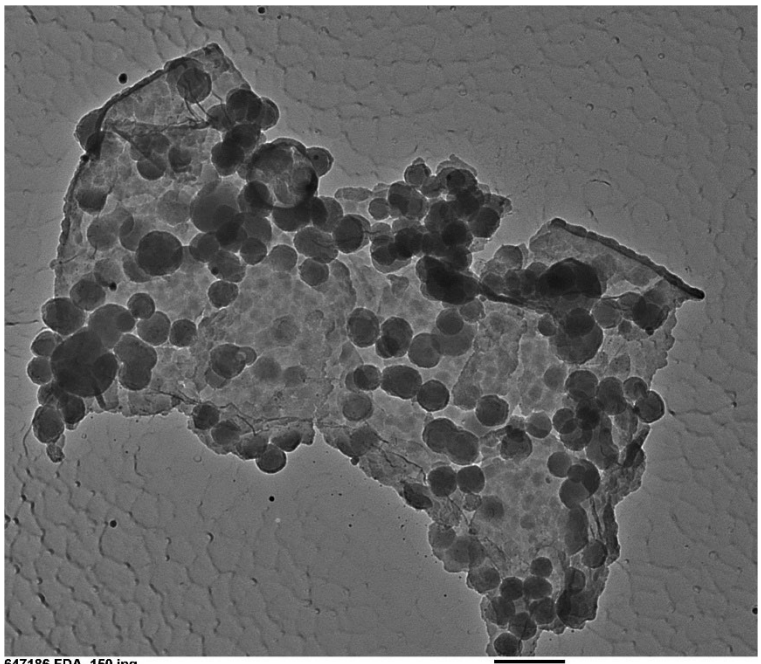
647186 FDA_153.jpg
647186-15
Mica
FDA
Cal: 0.003819 µm/pix
11:26 2023-08-30
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2000 m

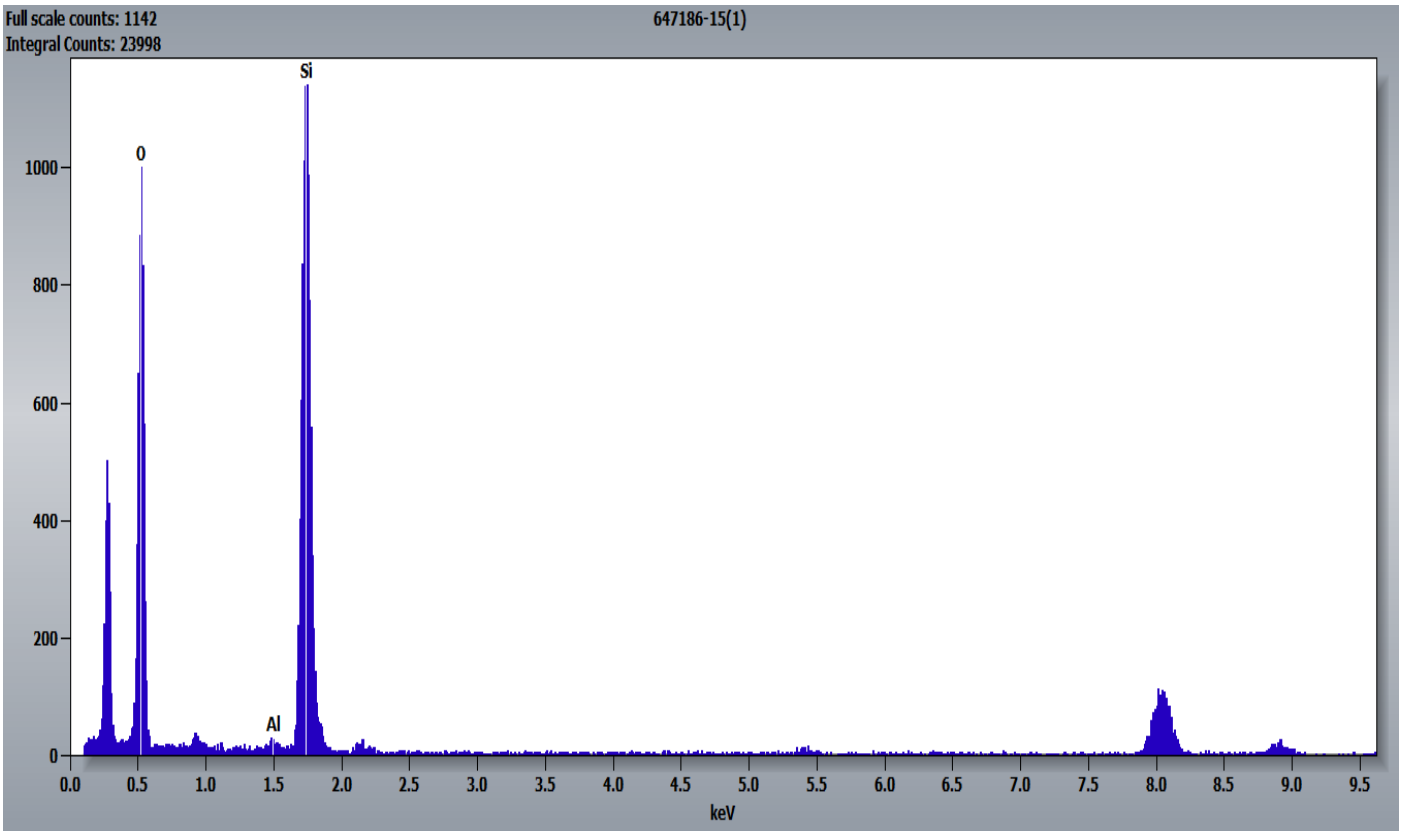
Chemistry from the Mica Particle Pictured Above



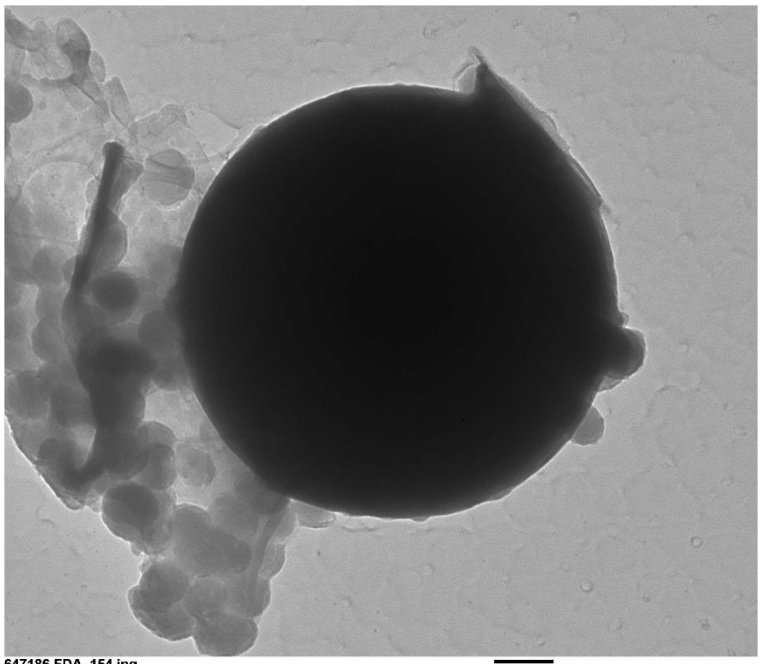
647186-15, Silicon Particles



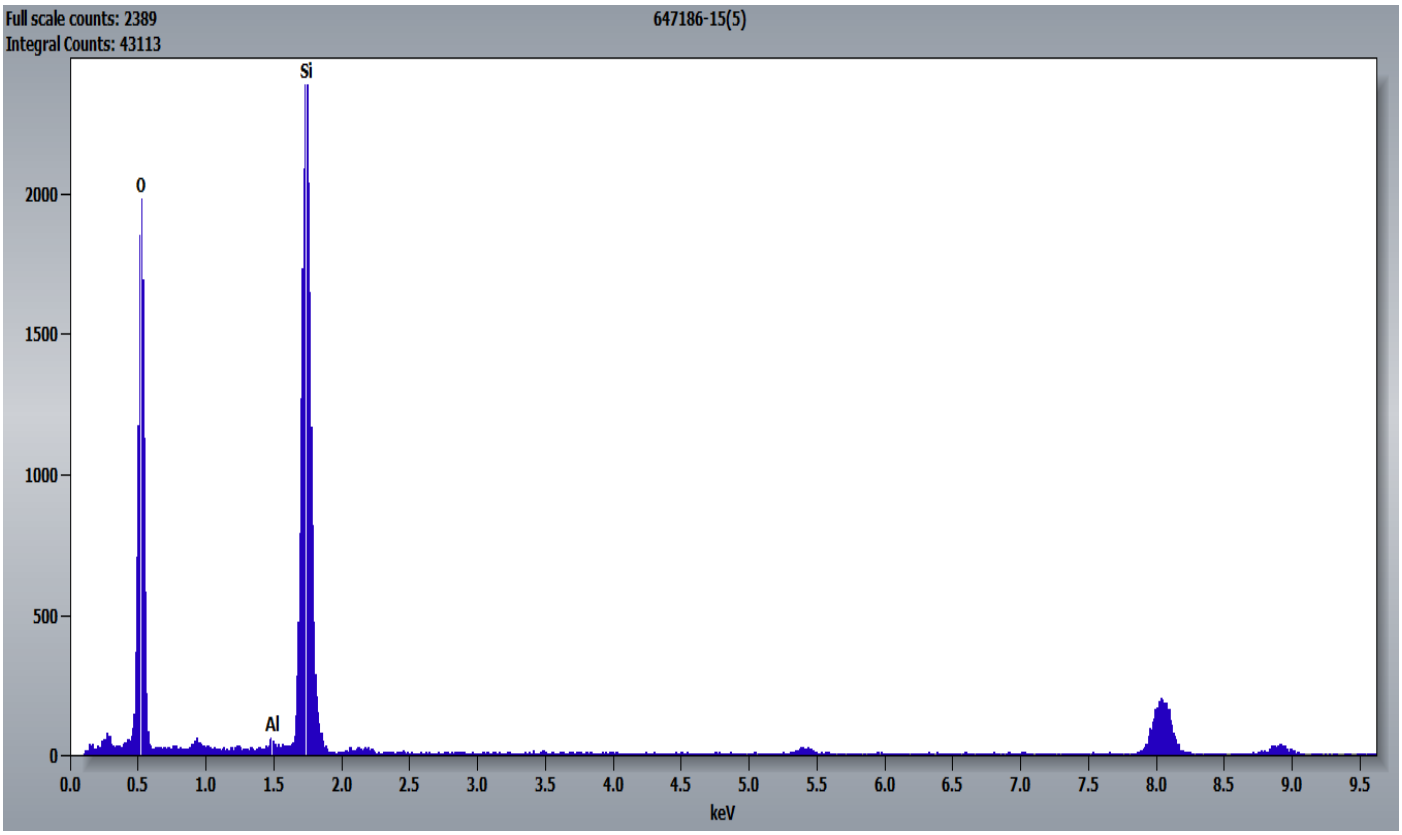
Chemistry from the Silicon Particles Pictured Above



647186-15, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-16, 16A, 16B/Client Sample: 05162023-16

PLM

All three aliquots of sample 05162023-16 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-16	No Asbestos Detected
647186-16A	No Asbestos Detected
647186-16B	No Asbestos Detected

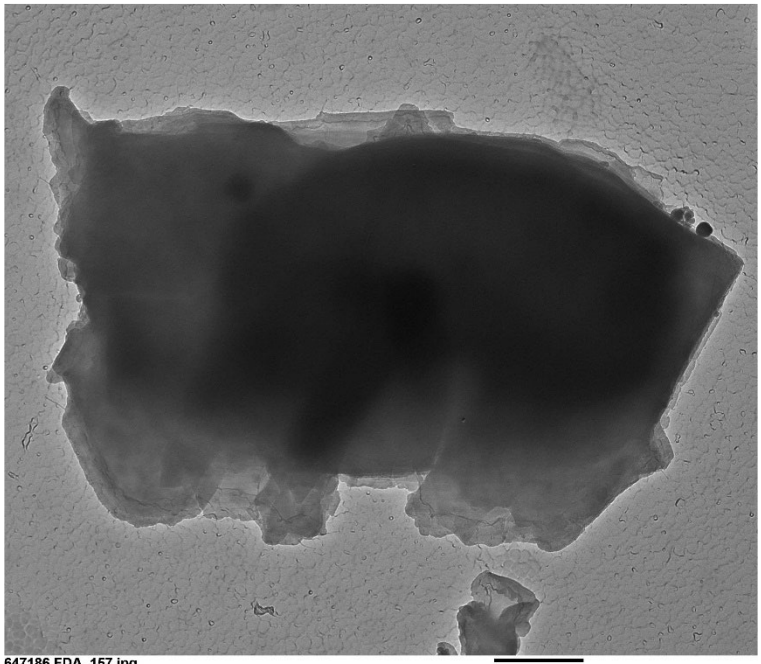
TEM

(b) (6) analyzed aliquot 16 on August 30, 2023. (b) (6) analyzed aliquots 16A and 16B on August 29, 2023. The primary particles observed were talc and mica; silicon and titanium particles were also observed along with silica spheres and talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

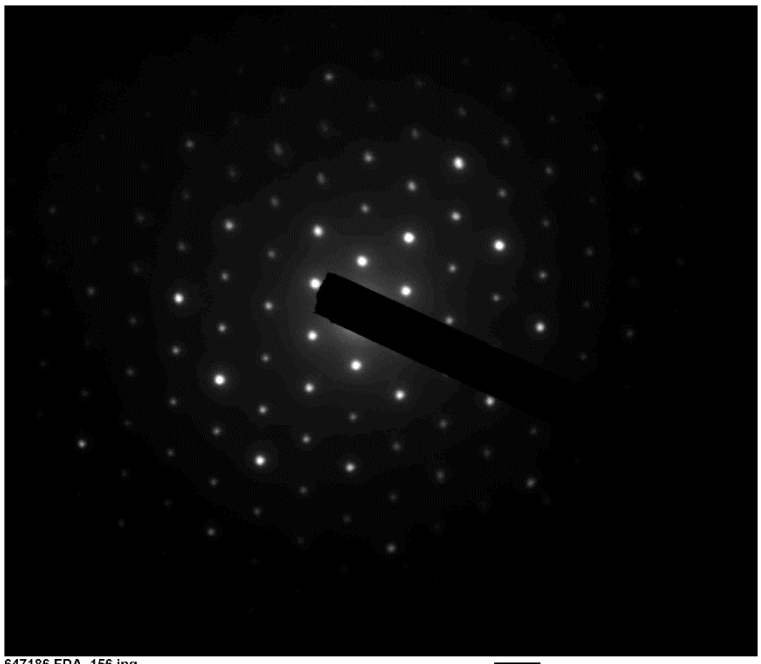
647186-16	No Asbestos Detected
647186-16A	No Asbestos Detected
647186-16B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

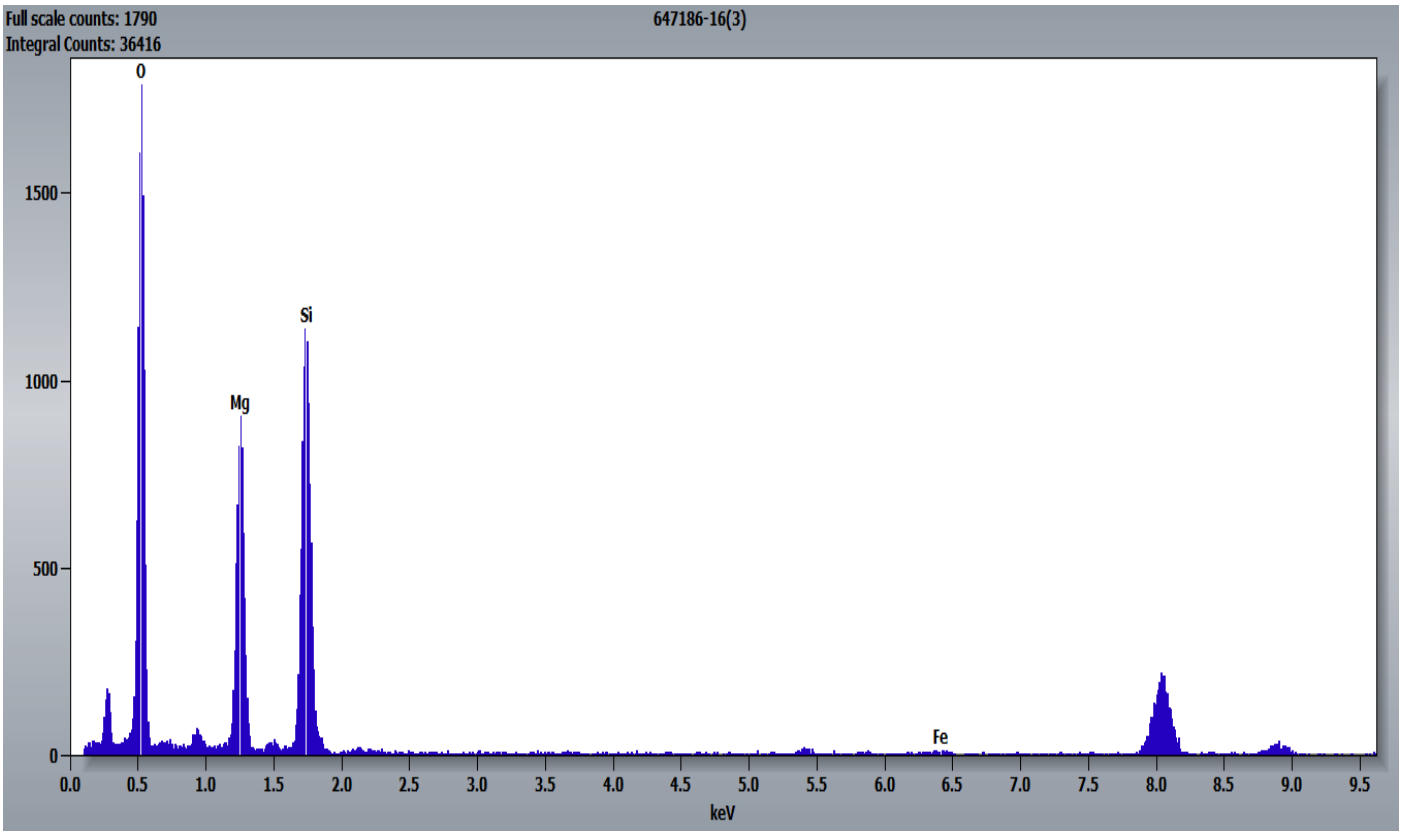
647186-16, Talc Particle



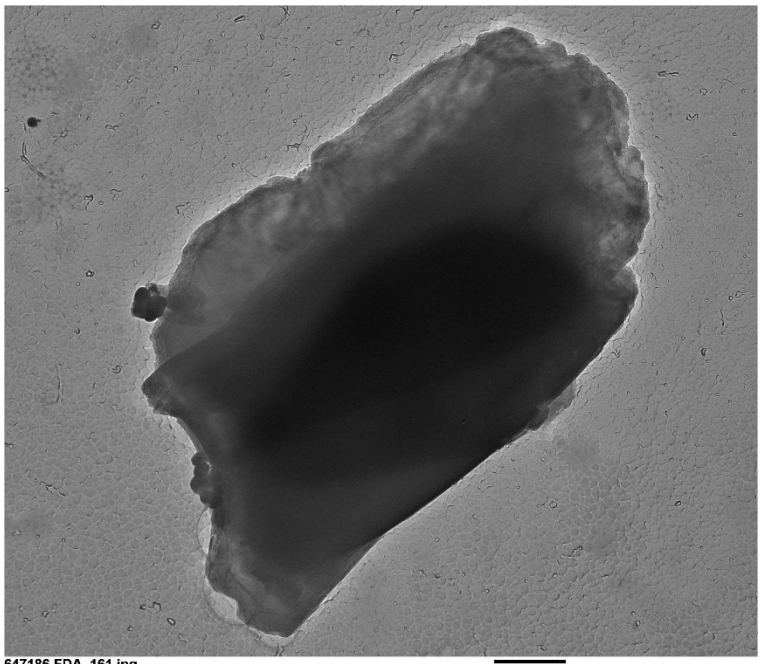
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



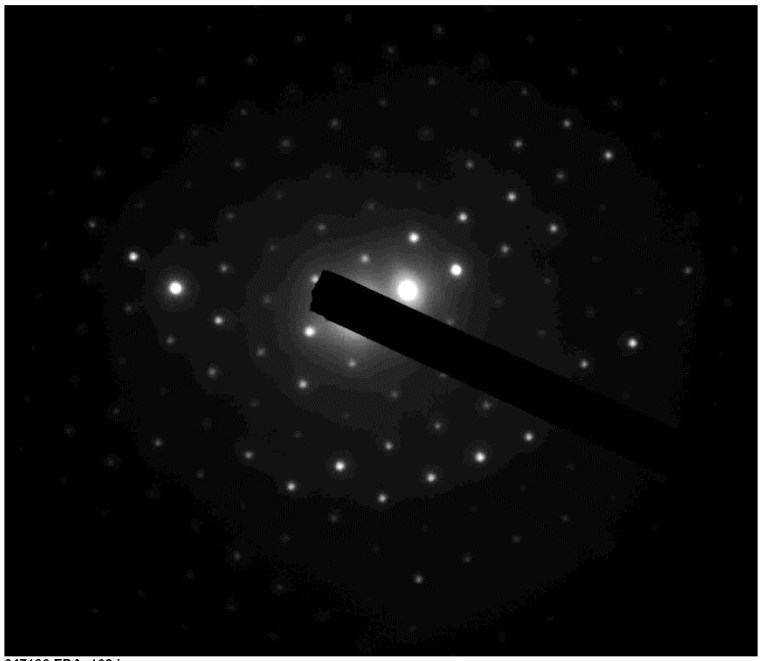
647186-16, Mica Particle



647186 FDA_161.jpg
647186-16
Mica
FDA
Cal: 0.002387 µm/pix
14:31 2023-08-30
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

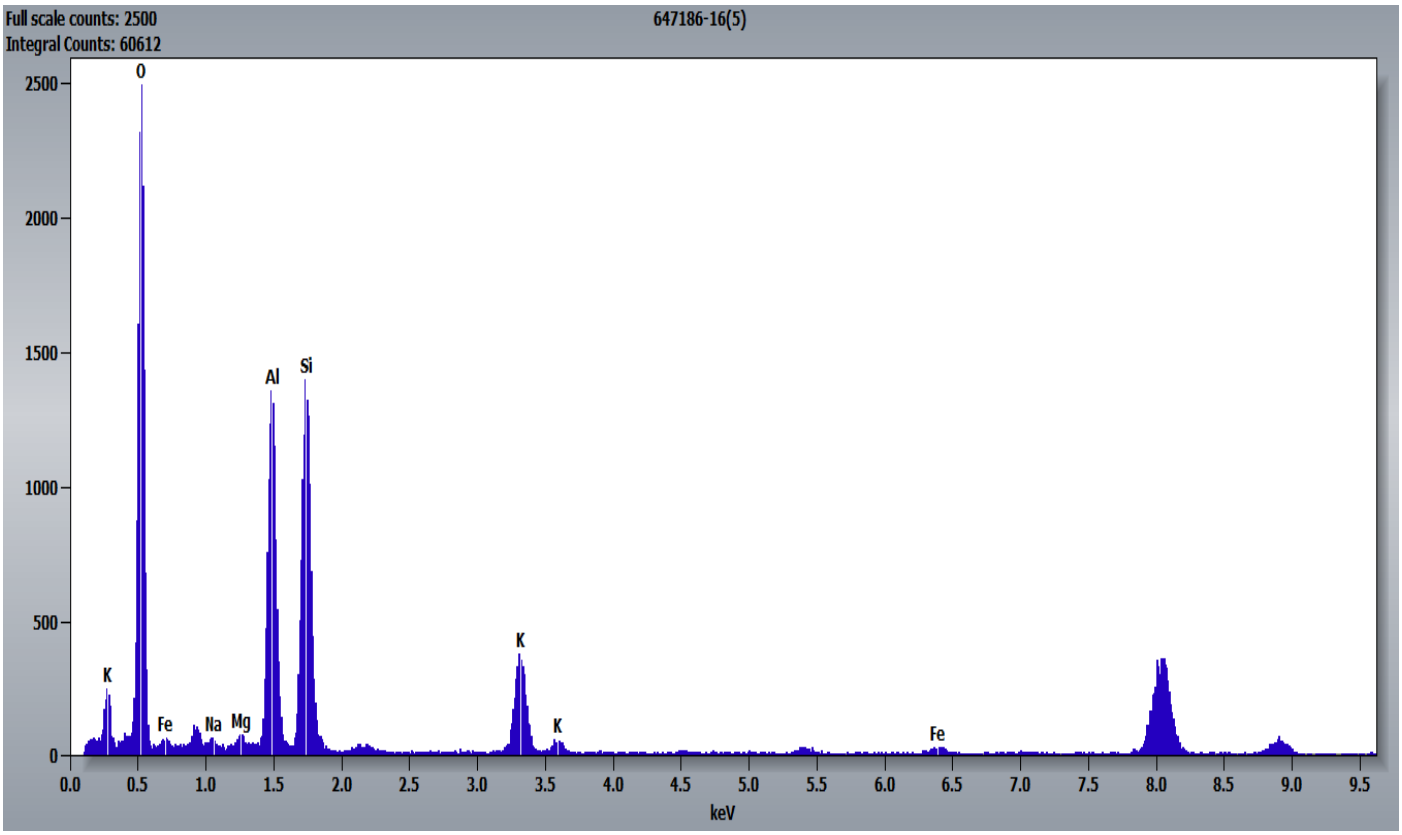
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above



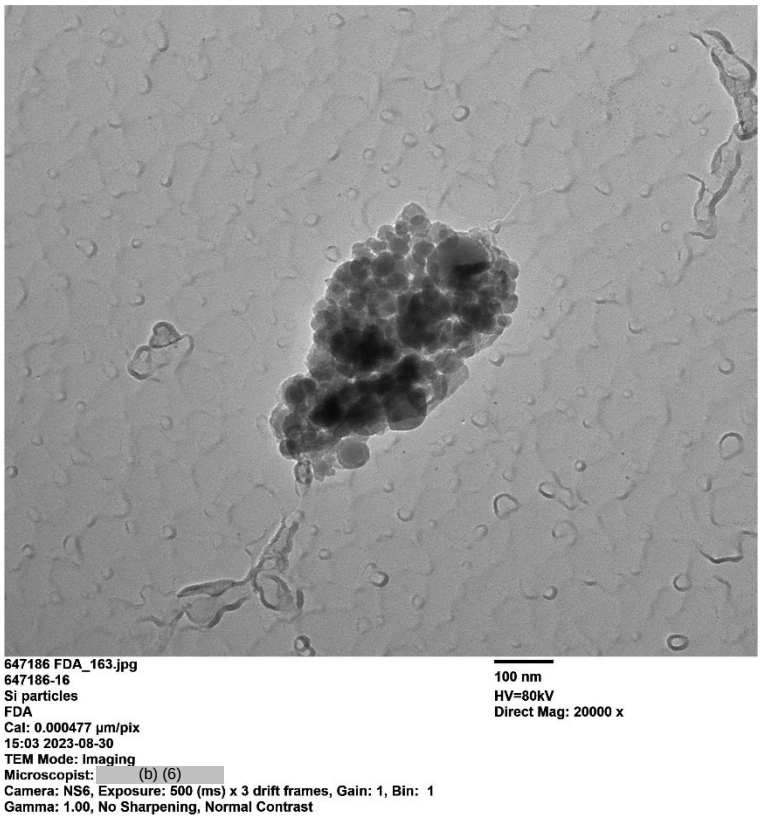
647186 FDA_160.jpg
647186-16
Mica
FDA
Cal: 0.000626 µm/pix
14:30 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

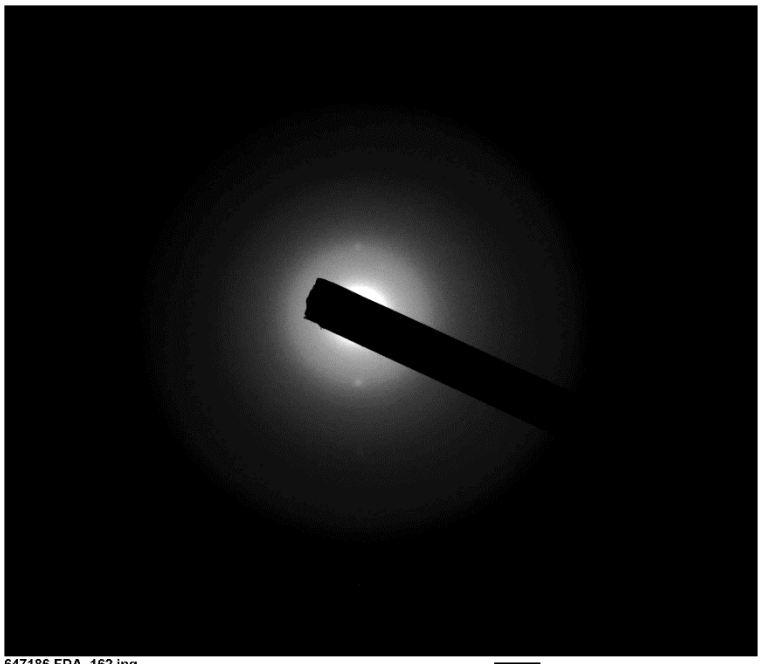
Chemistry from the Mica Particle Pictured Above



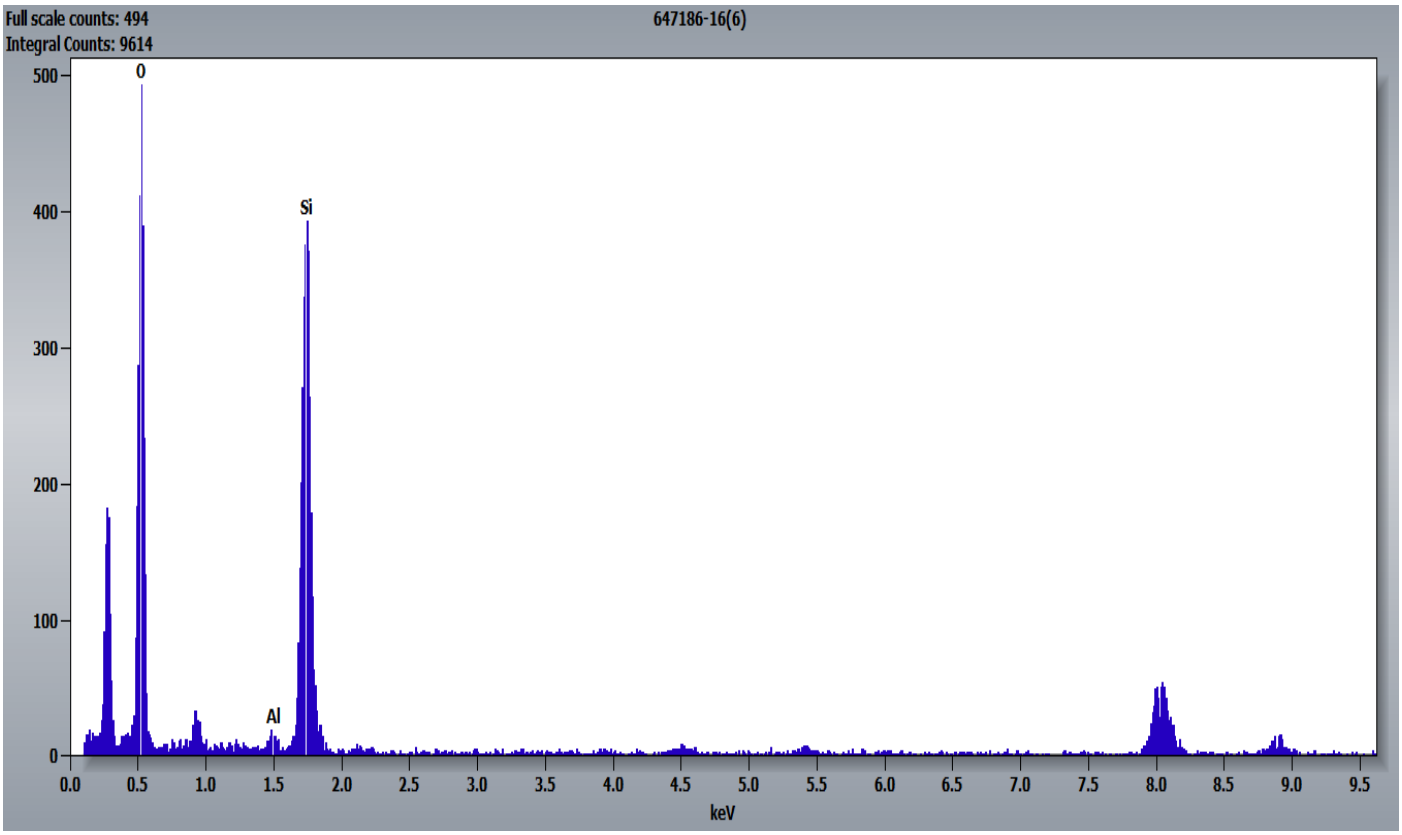
647186-16, Silicon Particle



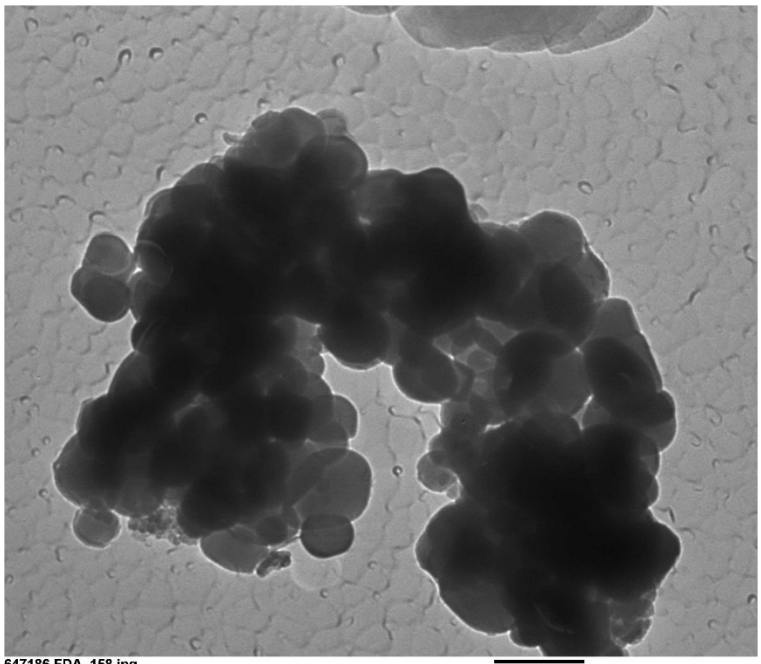
Diffraction Pattern from the Silicon Particle Pictured Above



Chemistry from the Silicon Particle Pictured Above



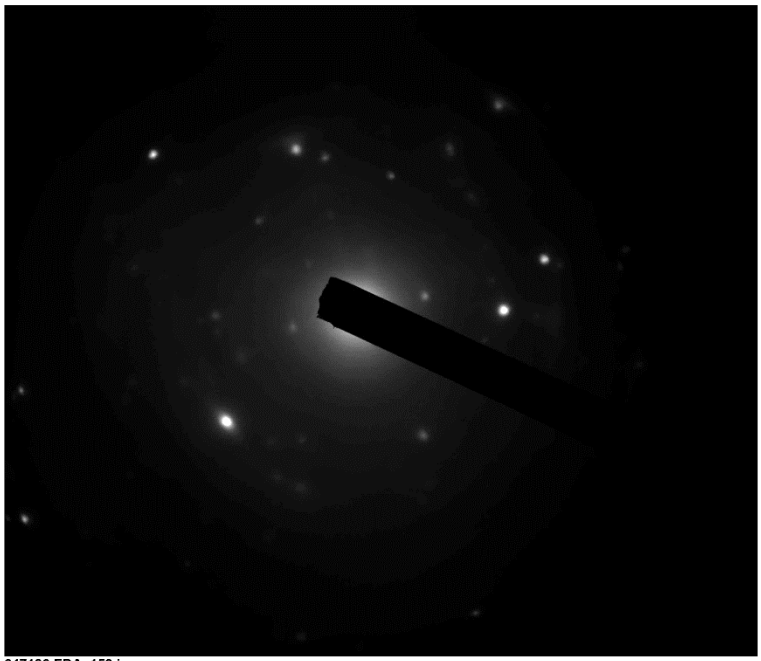
647186-16, Titanium Particles



647186 FDA_158.jpg
647186-16
Ti particles
FDA
Cal: 0.000626 µm/pix
14:27 2023-08-30
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 15000 x

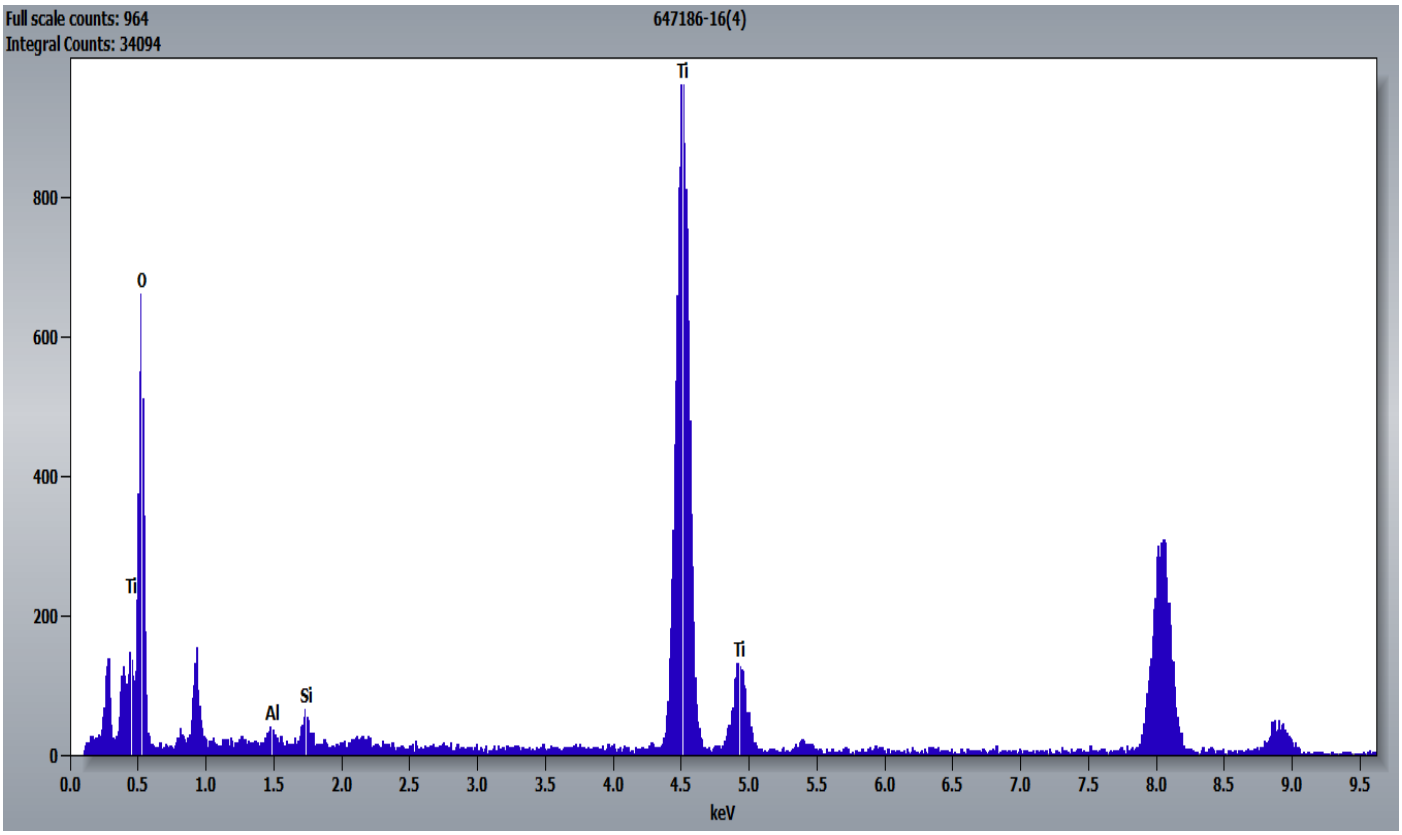
Diffraction Pattern from the Titanium Particles Pictured Above



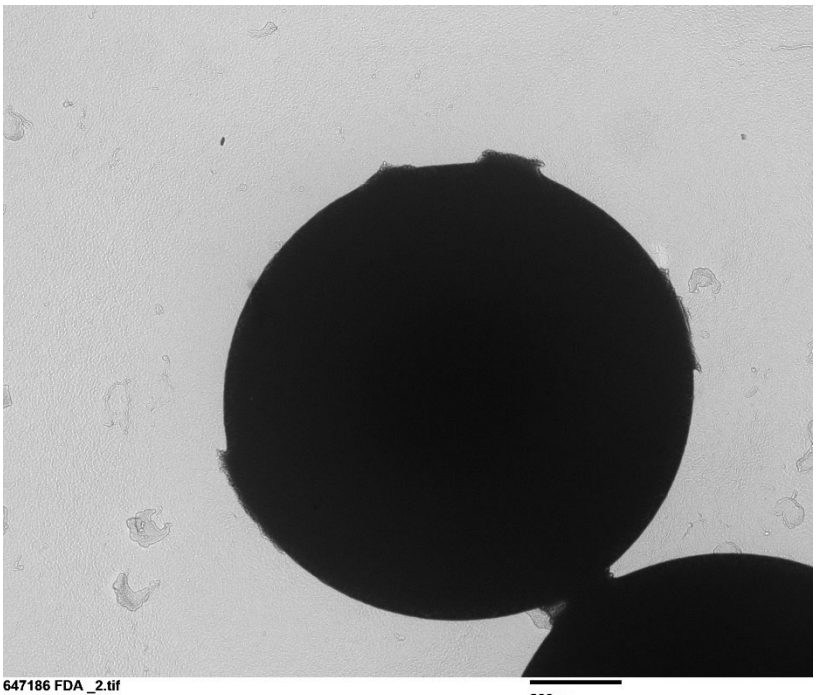
647186 FDA_159.jpg
647186-16
Ti particles
FDA
Cal: 0.000626 µm/pix
14:28 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

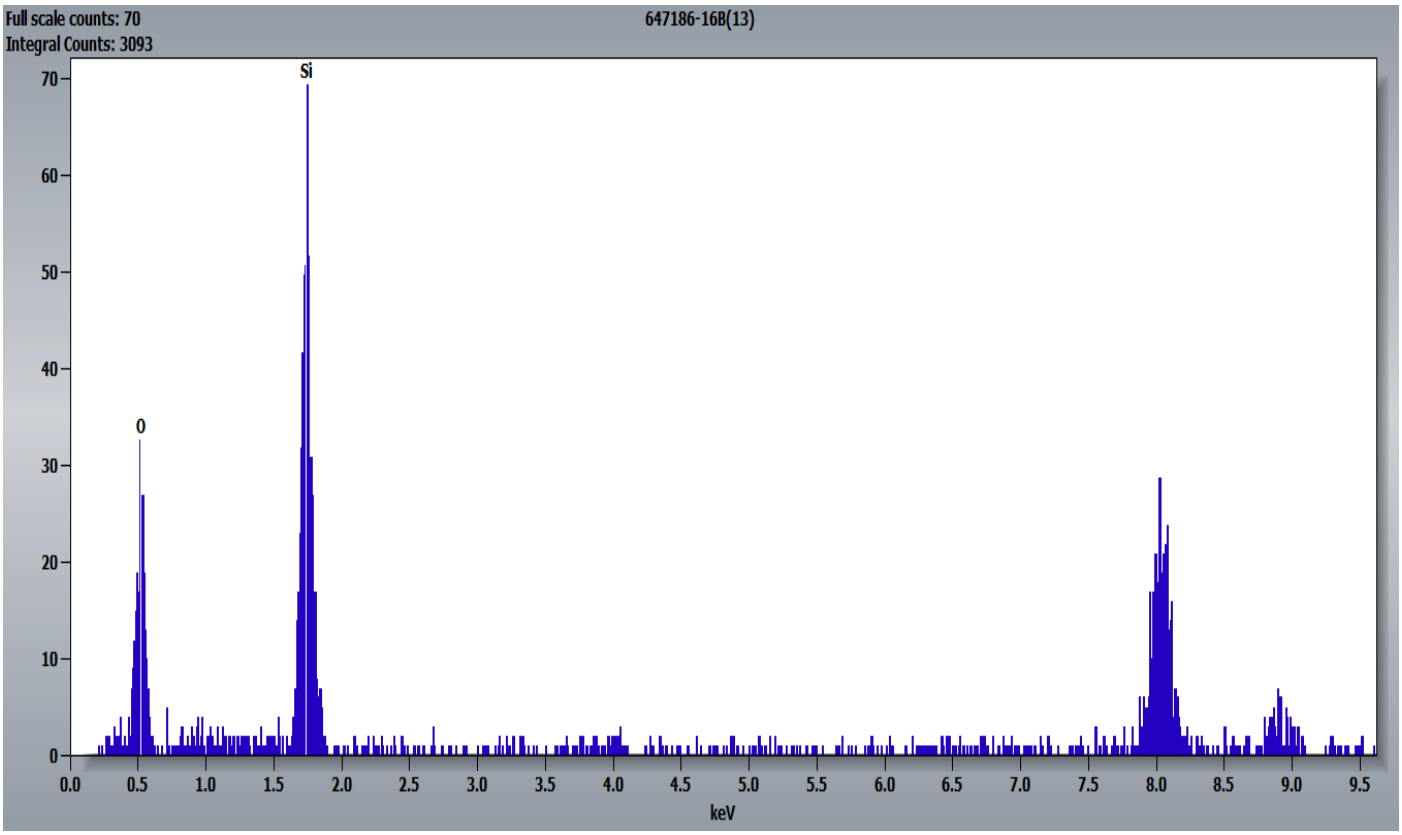
Chemistry from the Titanium Particles Pictured Above



647186-16B, Silica Sphere

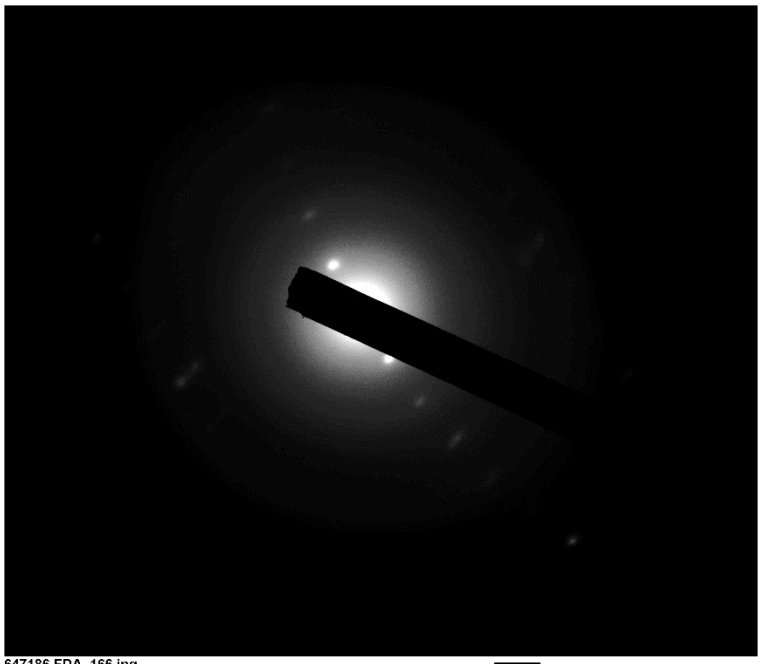


Chemistry from the Silica Sphere Pictured Above

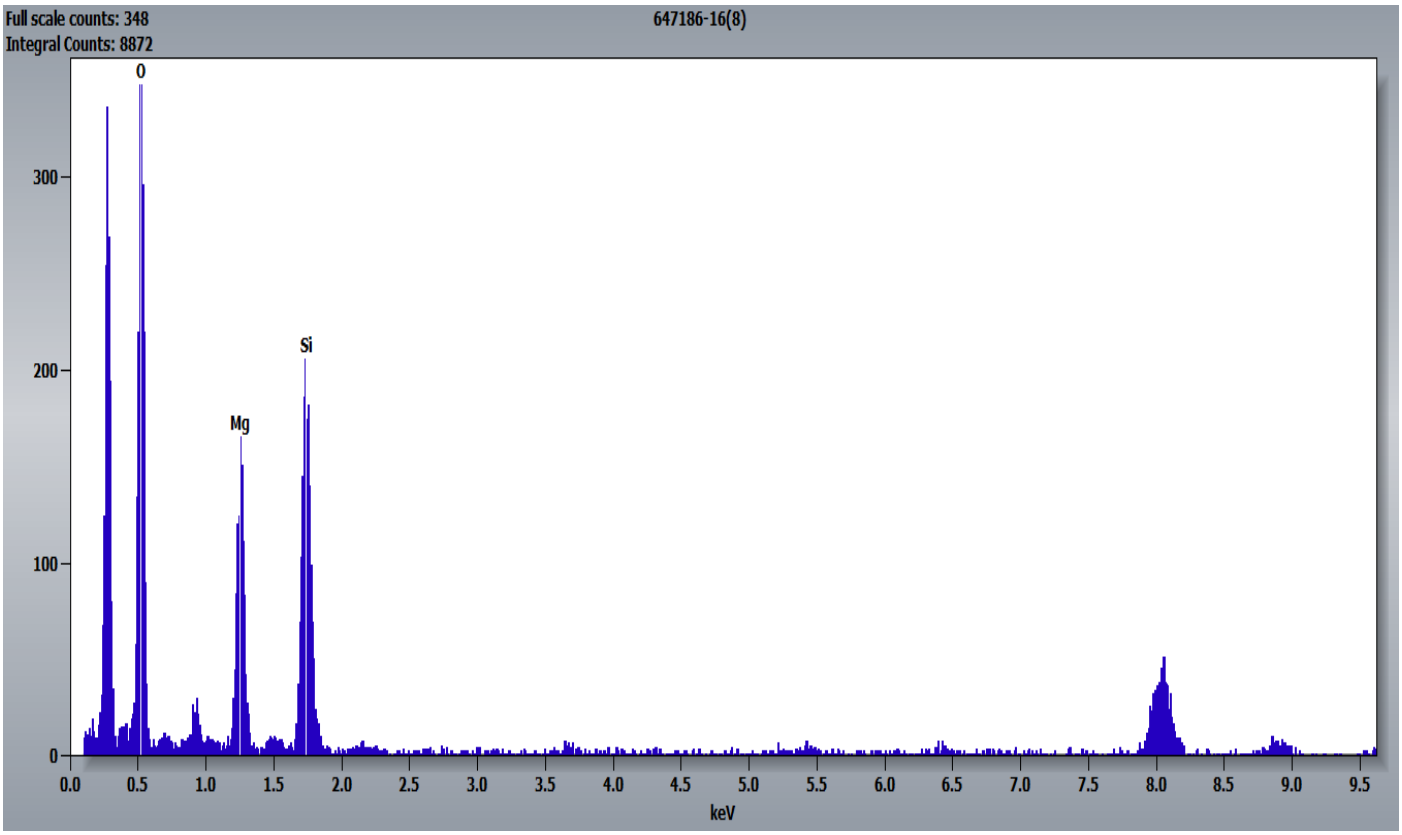


647186-16, Talc Ribbon

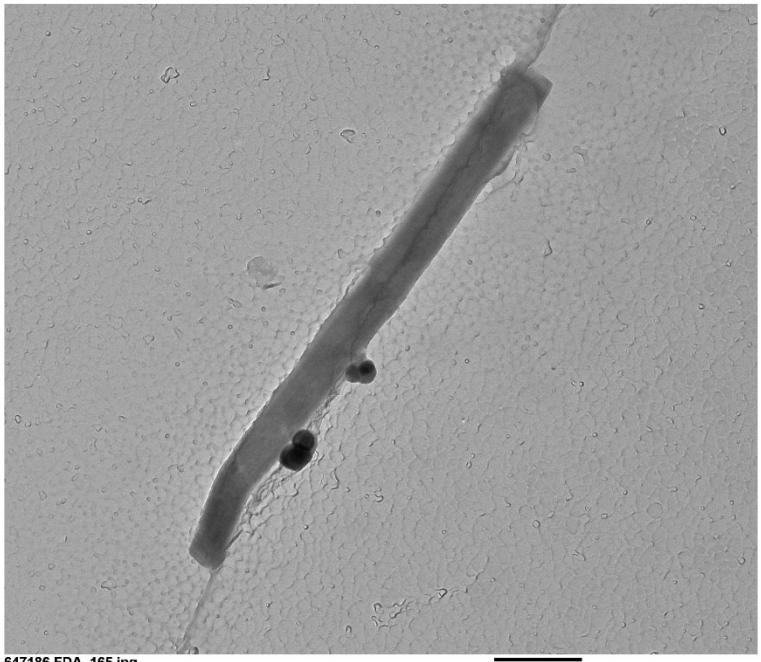
Diffraction Pattern from the Talc Ribbon Pictured Above



Chemistry from the Talc Ribbon Pictured Above



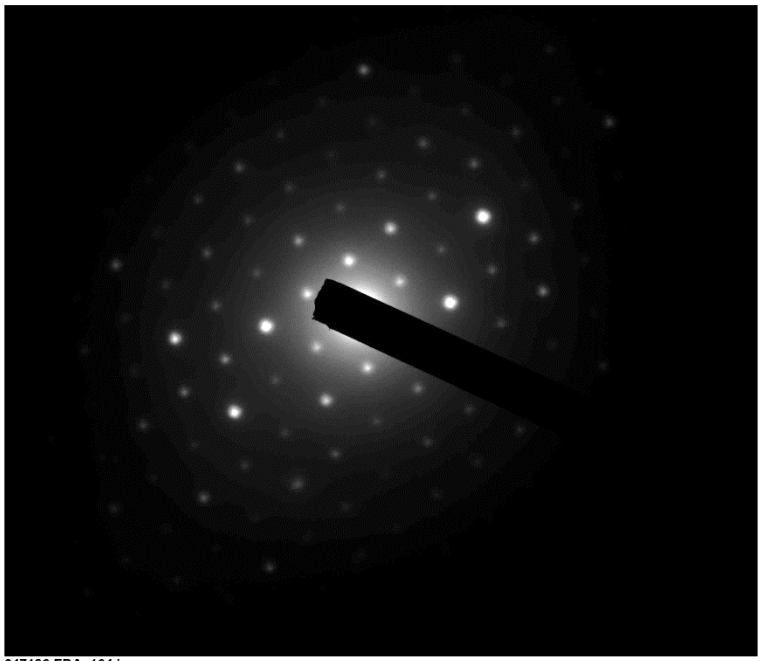
647186-16, Talc Fiber



647186 FDA_165.jpg
647186-16
Talc fiber
FDA
Cal: 0.001612 µm/pix
15:09 2023-08-30
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

500 nm
HV=80kV
Direct Mag: 6000 x

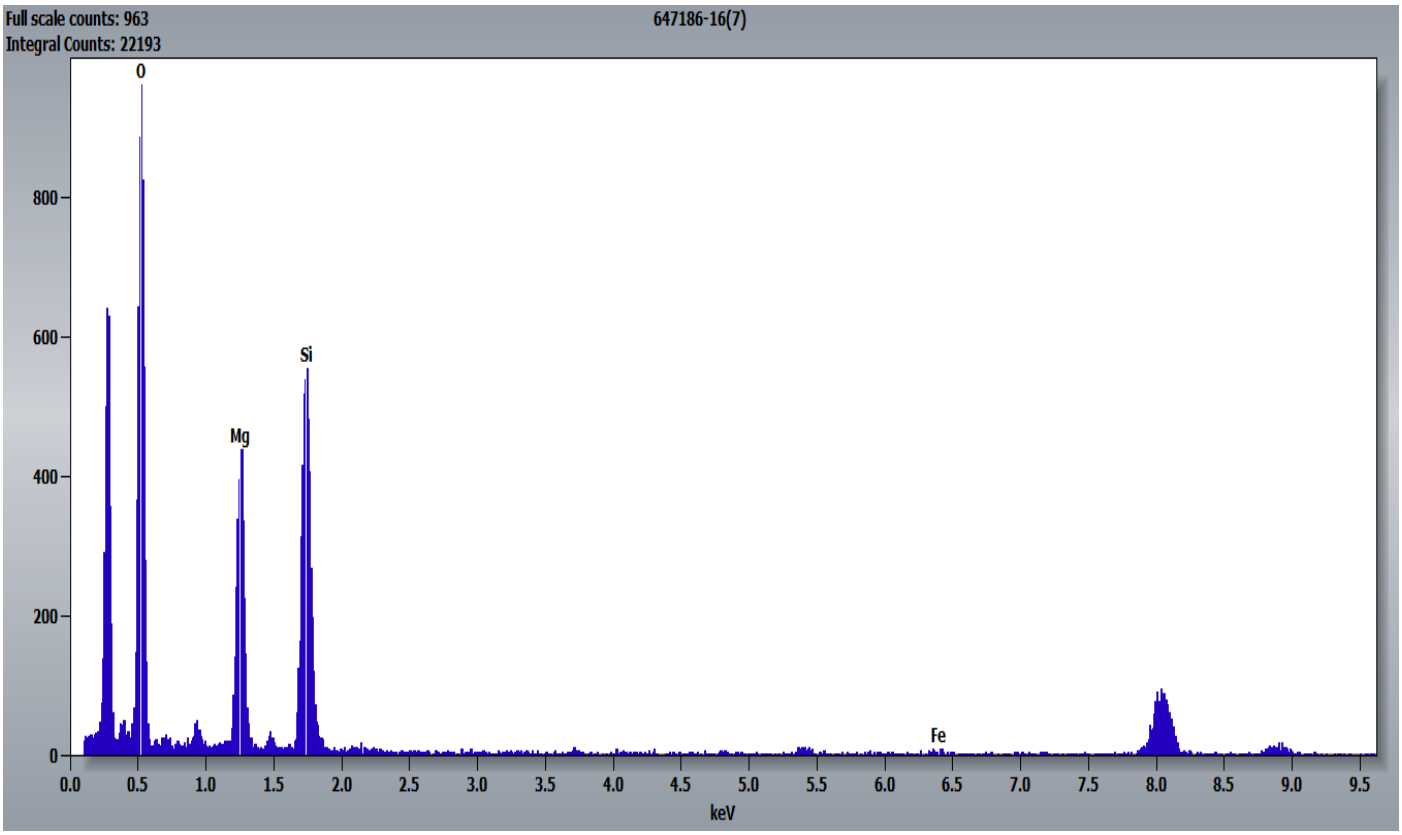
Hexagonal Diffraction Pattern from the Talc Fiber Pictured Above



647186 FDA_164.jpg
647186-16
Talc fiber
FDA
Cal: 0.000477 µm/pix
15:07 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Fiber Pictured Above



647186-17, 17A, 17B/Client Sample: 05162023-17

PLM

All three aliquots of sample 05162023-17 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-17	No Asbestos Detected
647186-17A	No Asbestos Detected
647186-17B	No Asbestos Detected

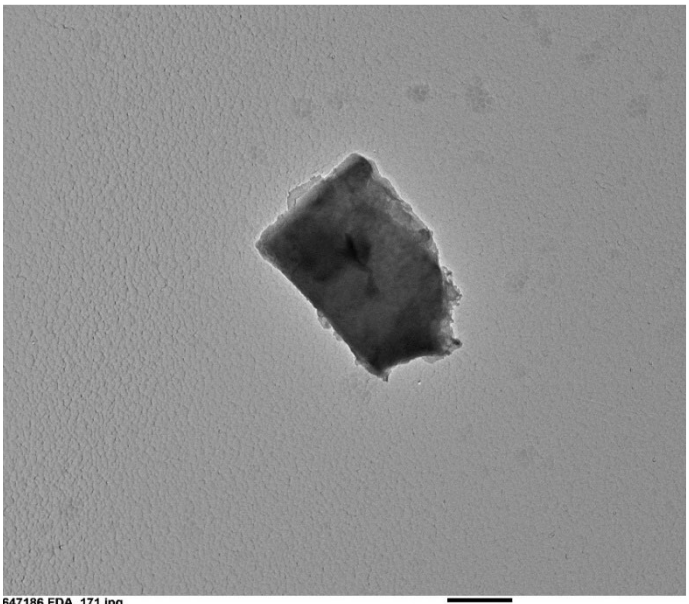
TEM

(b) (6) analyzed aliquots 17 on August 31, 2023. (b) (6) analyzed aliquot 17A on August 29, 2023, and aliquot 17B on August 30, 2023. The primary particles observed were talc and titanium; silica spheres were also observed along with silicon particles, chromium particles, and talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

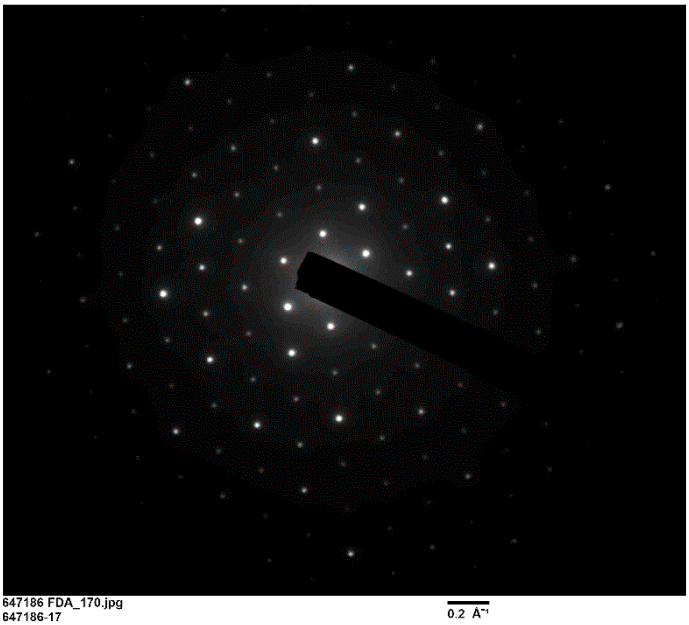
647186-17	No Asbestos Detected
647186-17A	No Asbestos Detected
647186-17B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

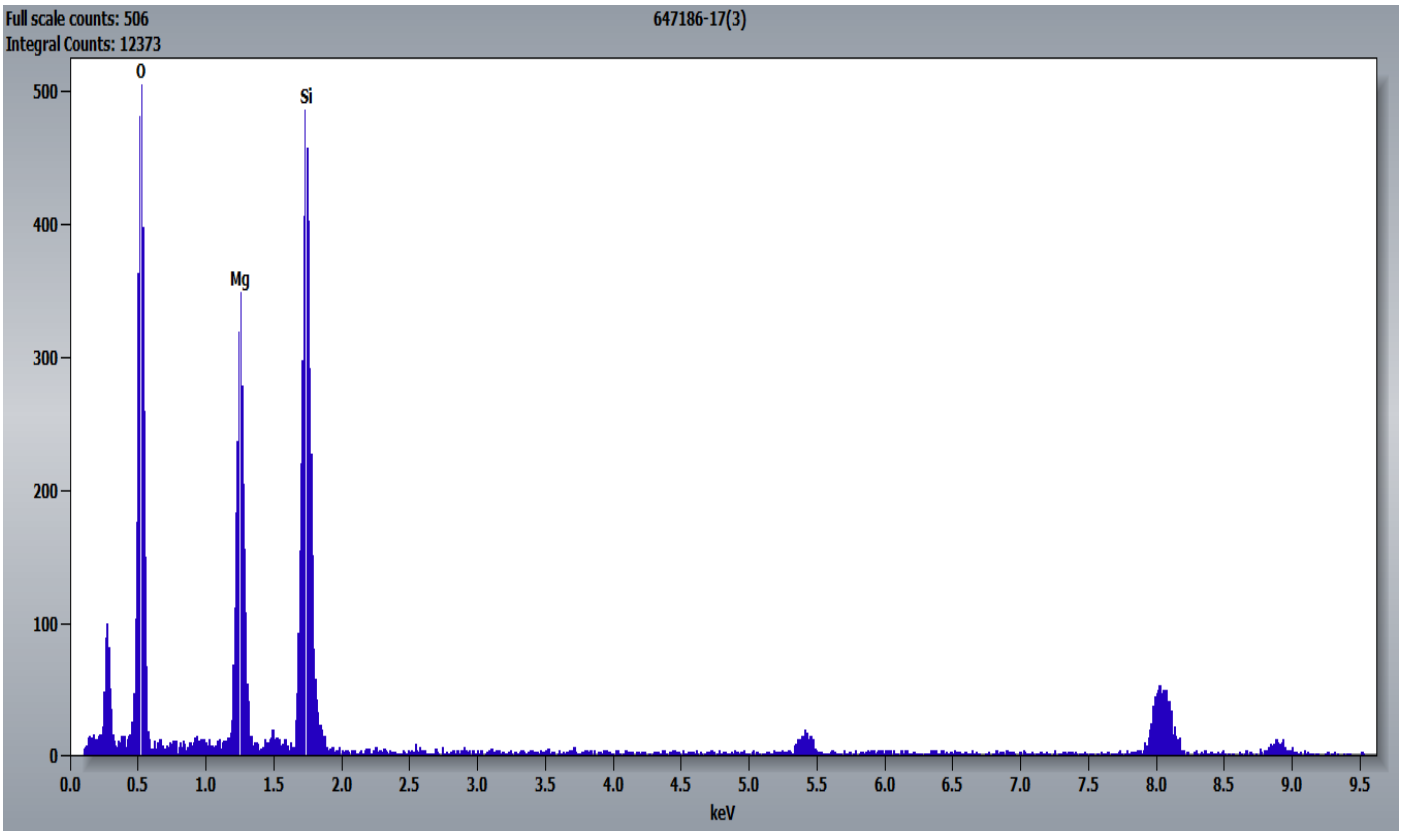
647186-17, Talc Particle



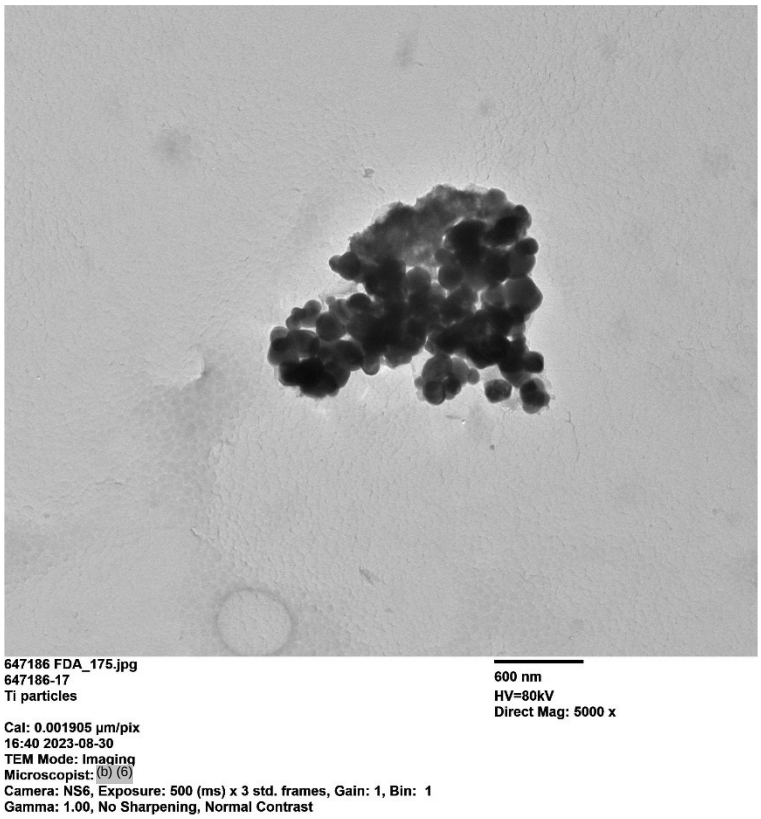
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



647186-17, Titanium Particles



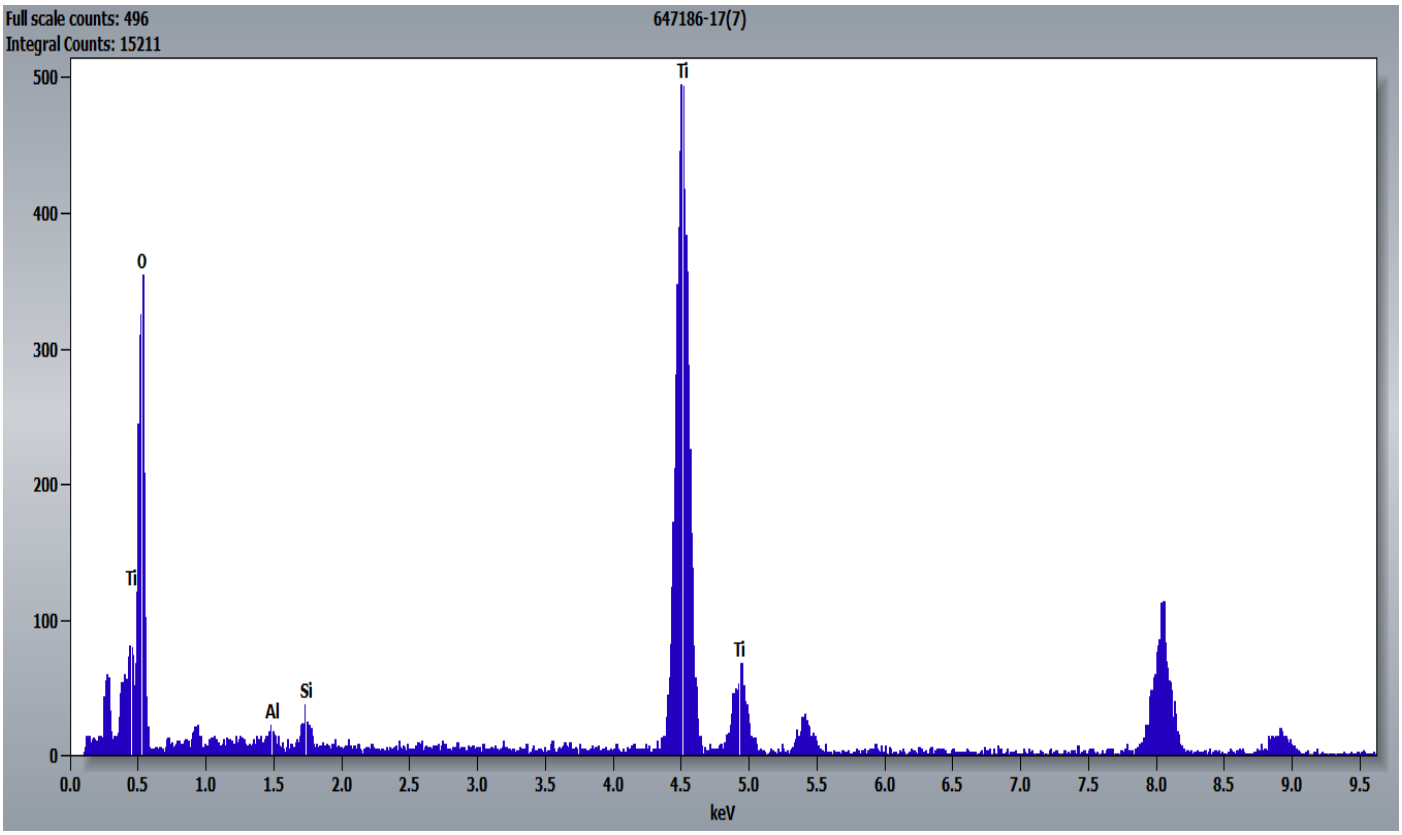
Diffraction Pattern from the Titanium Particles Pictured Above

647186 FDA_174.jpg
647186-17
Ti particles

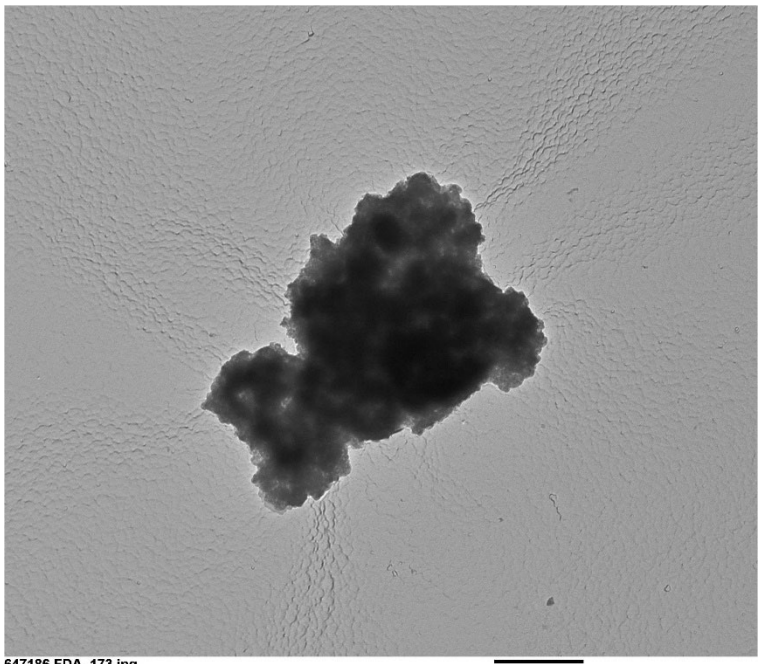
Cal: 0.001905 µm/pix
16:39 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

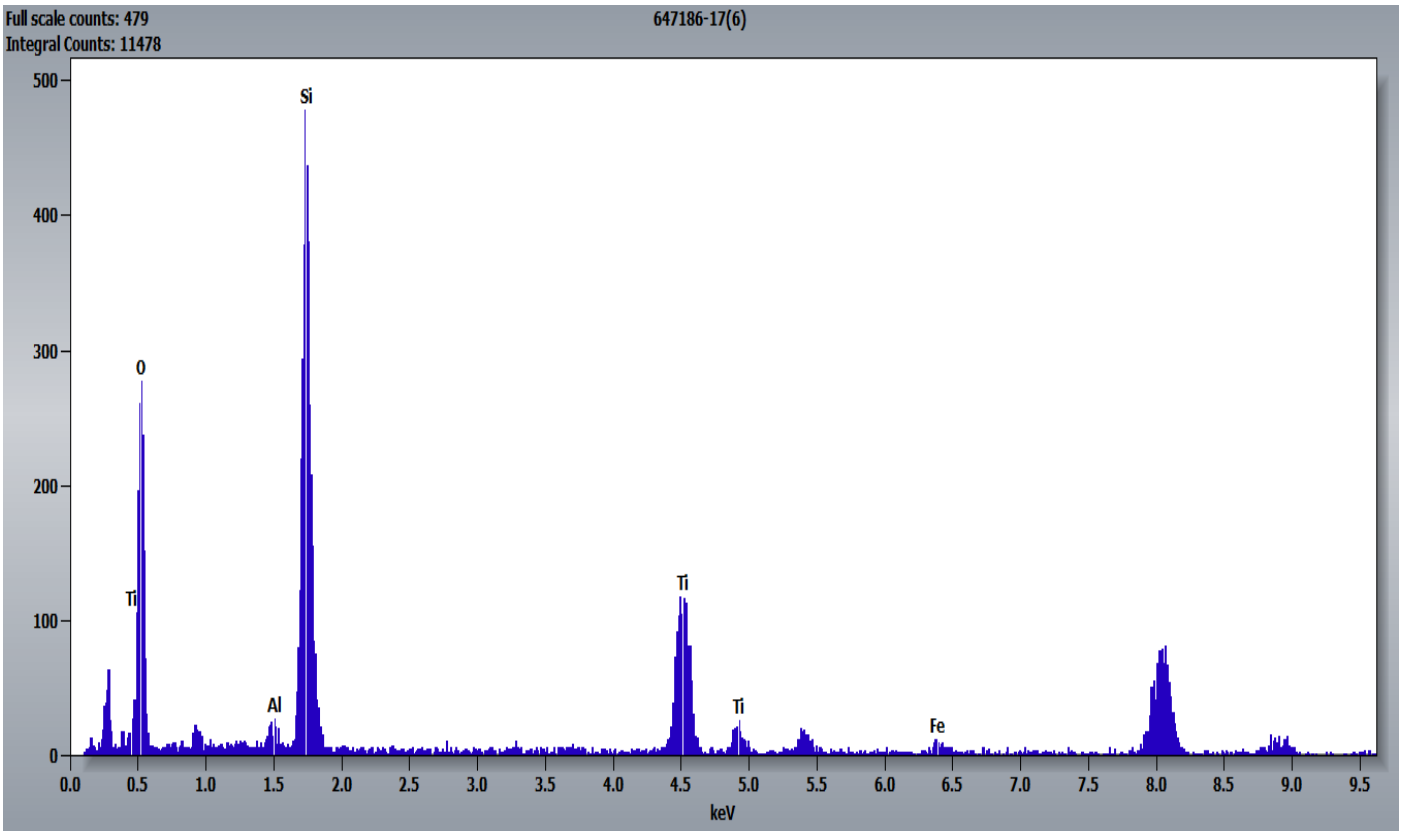
Chemistry from the Titanium Particles Pictured Above



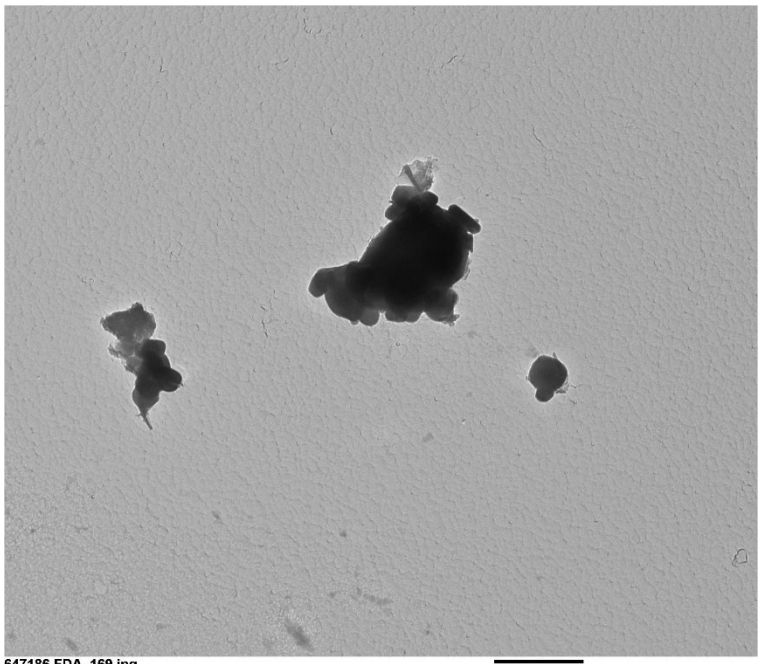
647186-17, Silicon Particle with Titanium



Chemistry from the Silicon Particle with Titanium Pictured Above



647186-17, Chromium Particles with Titanium

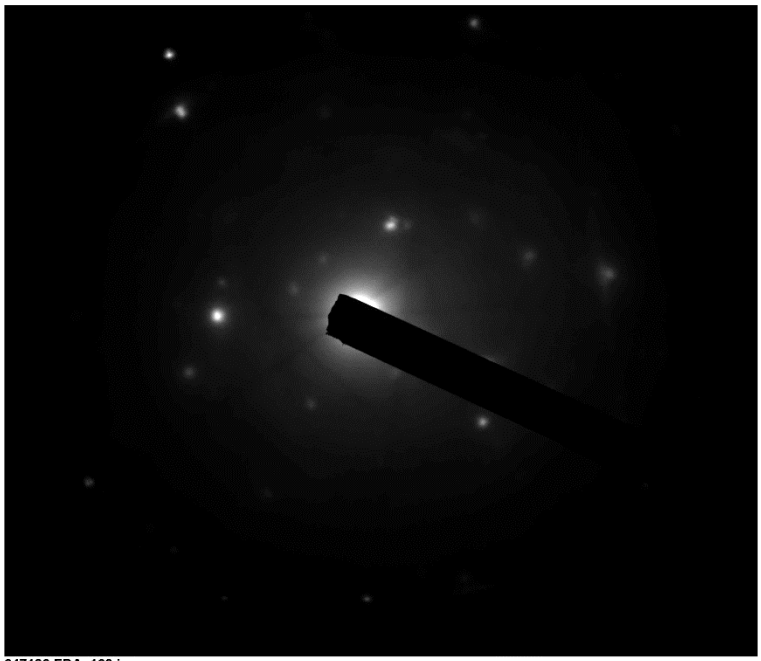


647186 FDA_169.jpg
647186-17
Ti.Cr Particles

Cal: 0.001905 µm/pix
16:21 2023-08-30
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 5000 x

Diffraction Pattern from the Chromium Particles with Titanium Pictured Above

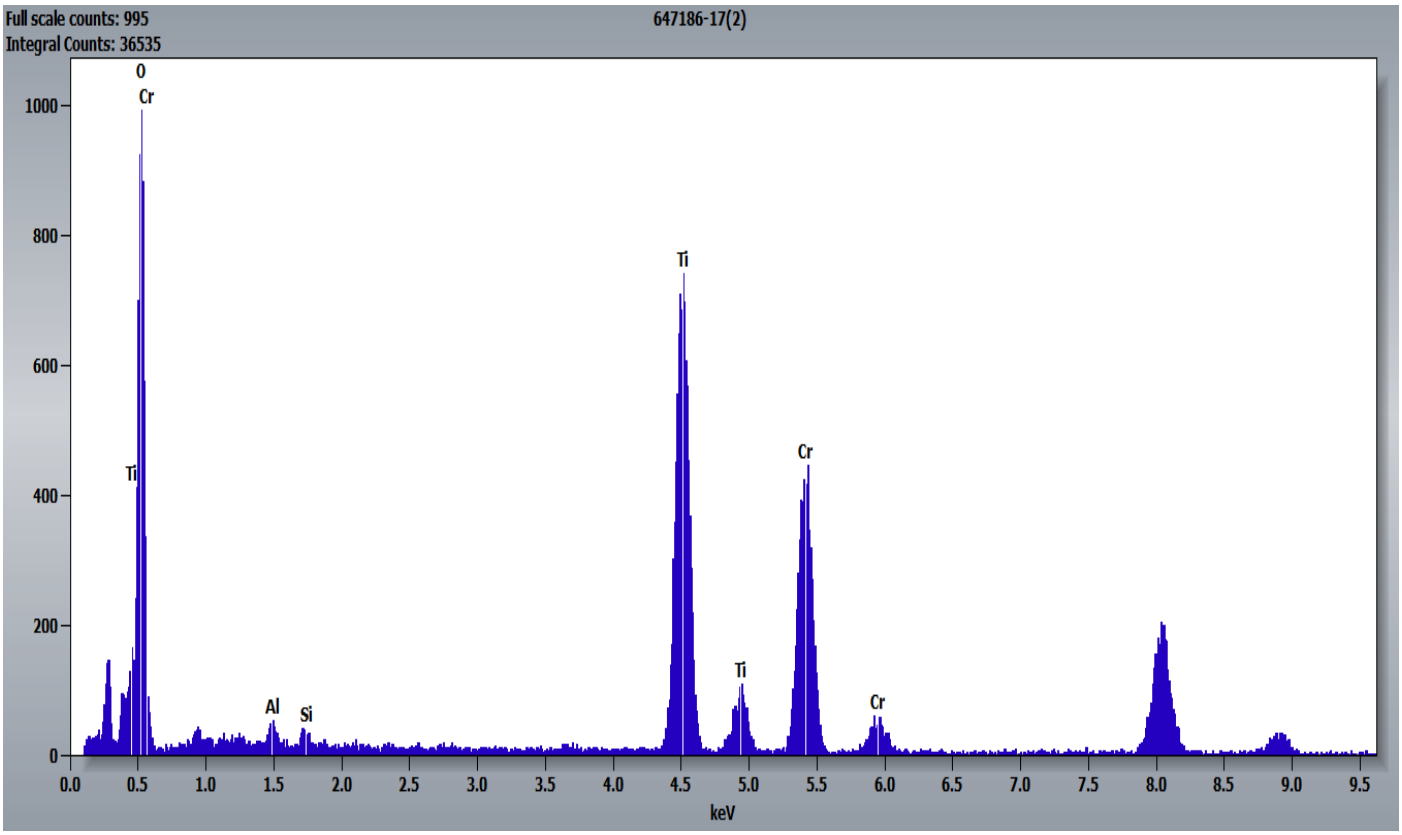


647186 FDA_168.jpg
647186-17
Ti.Cr Particles

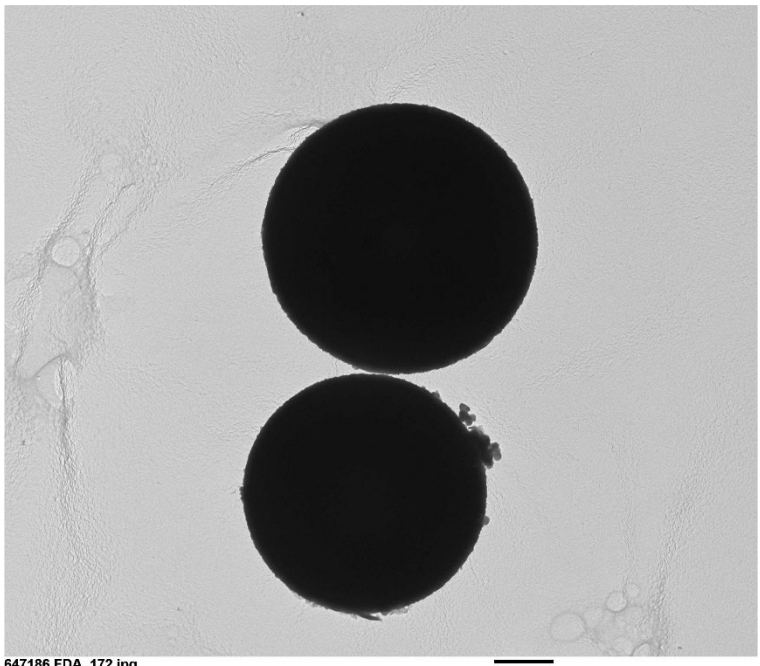
16:20 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

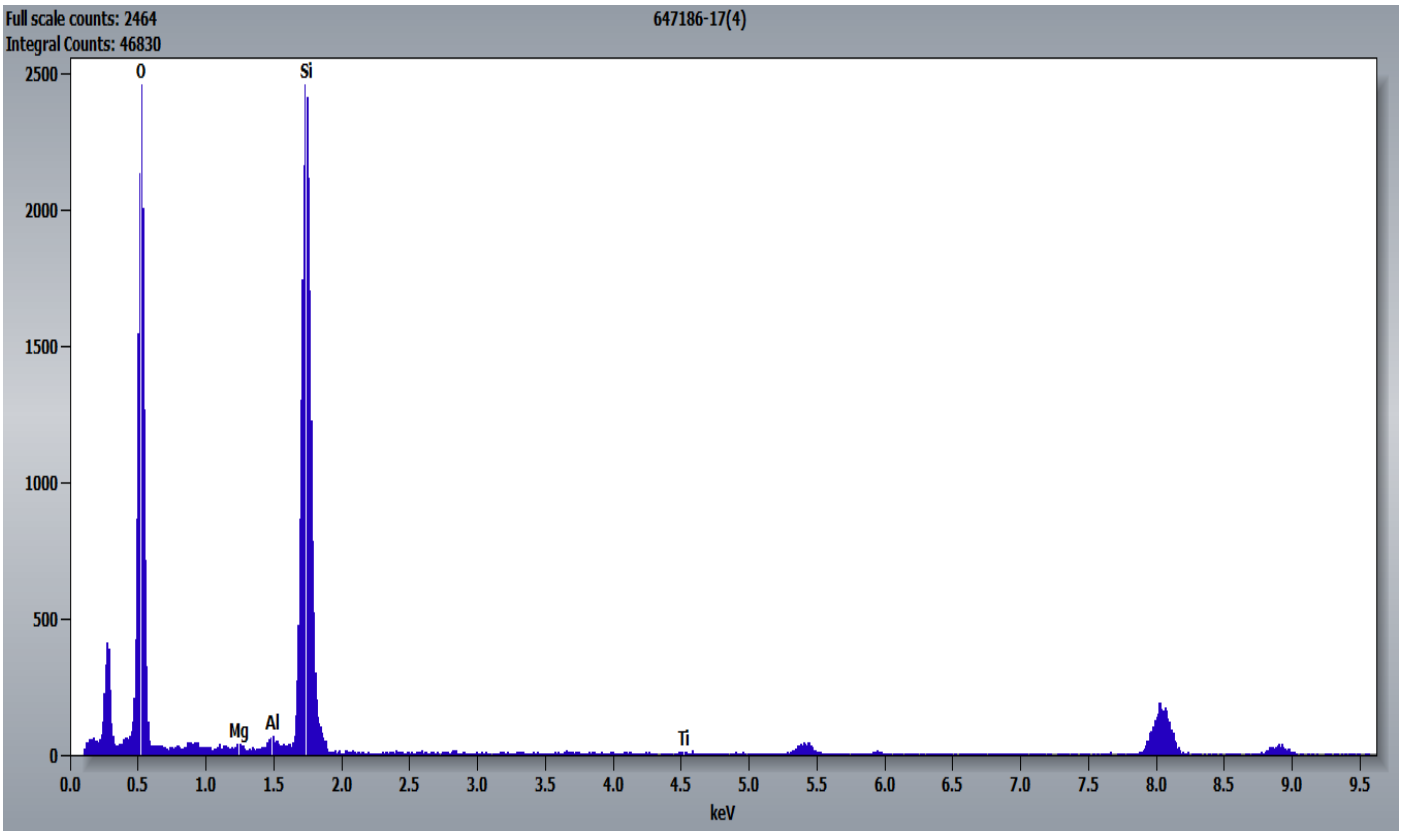
Chemistry from the Chromium Particles with Titanium Pictured Above



647186-17, Silica Spheres

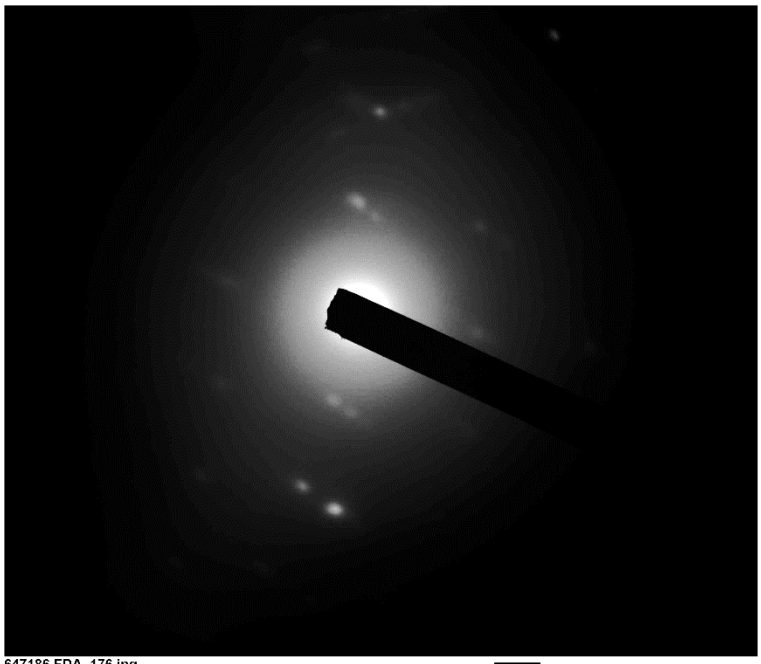


Chemistry from the Silica Spheres Pictured Above



647186-17, Talc Ribbon

Diffraction Pattern from the Talc Ribbon Particle Pictured Above

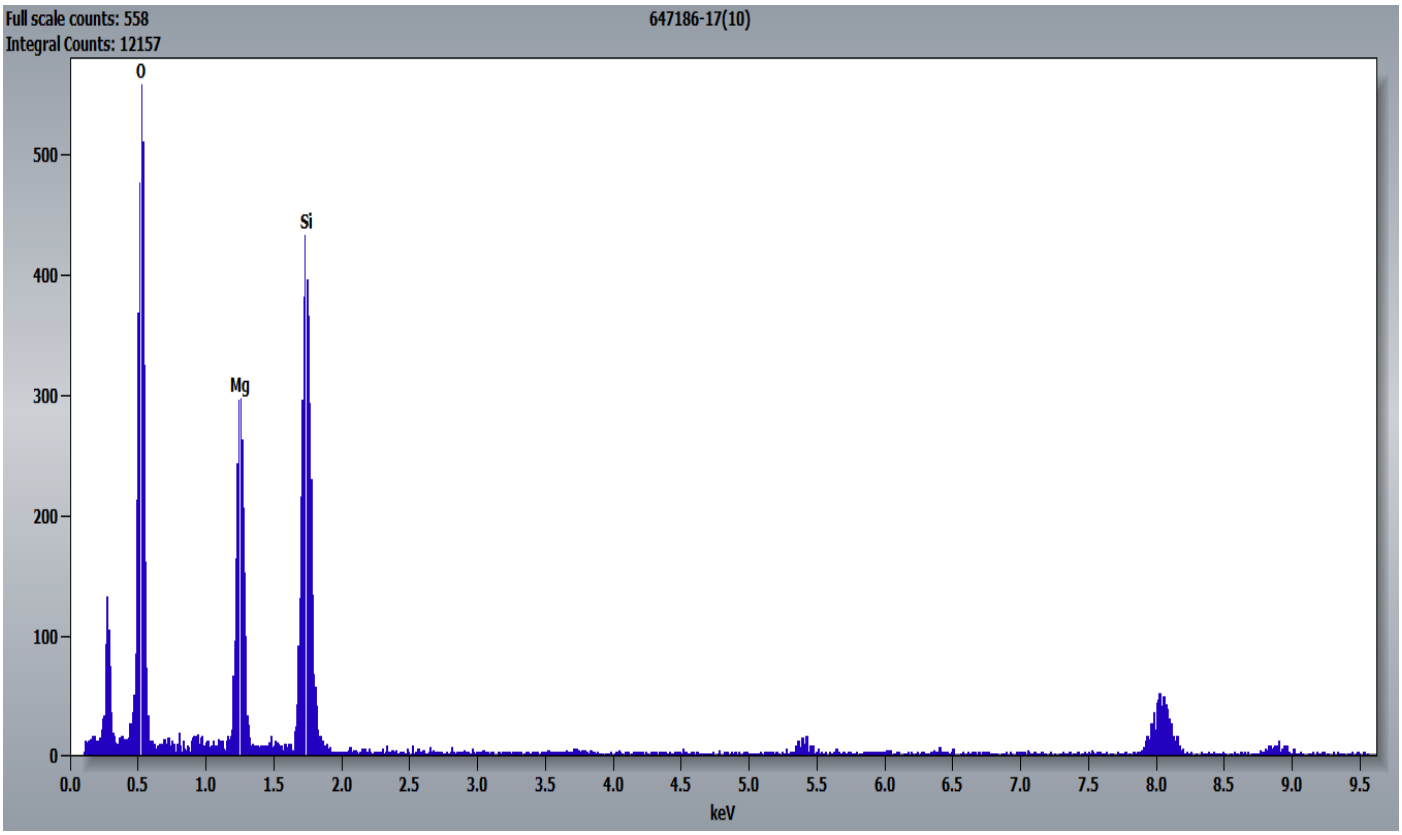


647186 FDA_176.jpg
647186-17
Talc Ribbon

Cal: 0.001905 µm/pix
16:58 2023-08-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



647186-18, 18A, 18B/Client Sample: 05162023-18

PLM

All three aliquots of sample 05162023-18 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-18	No Asbestos Detected
647186-18A	No Asbestos Detected
647186-18B	No Asbestos Detected

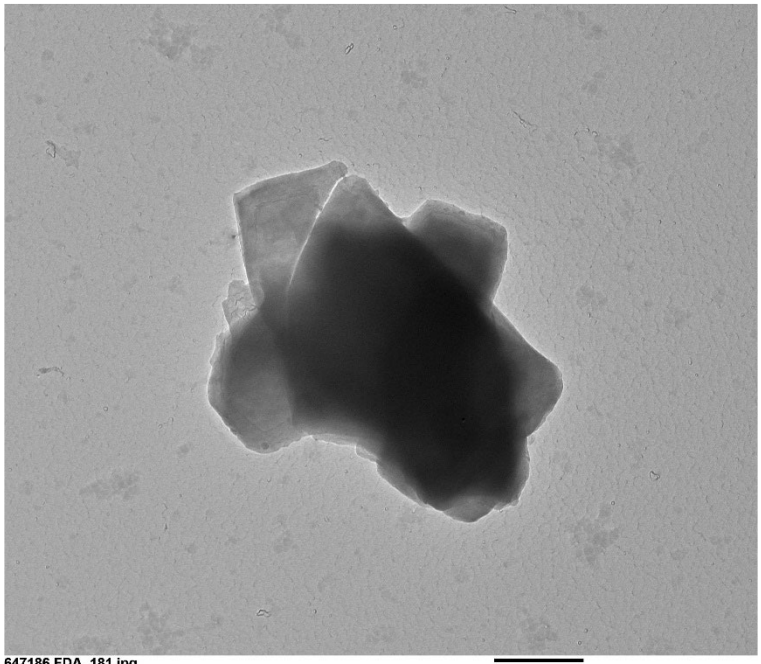
TEM

(b) (6) analyzed aliquot 18 on August 31, 2023. (b) (6) analyzed aliquots 18A and 18B on August 30, 2023. The primary particles observed were talc and mica; silicon particles and silica spheres were also observed along with chromium particles and talc ribbons/fibers. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

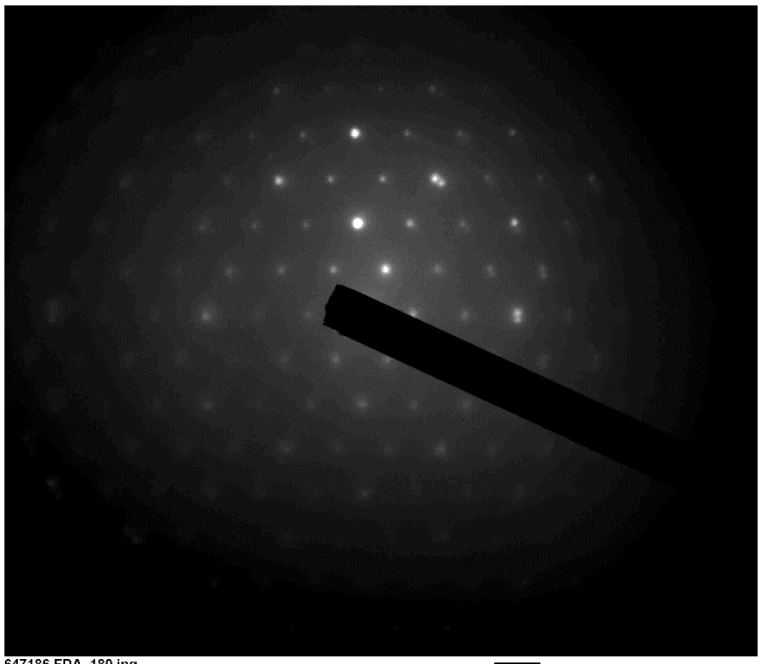
647186-18	No Asbestos Detected
647186-18A	No Asbestos Detected
647186-18B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-18, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

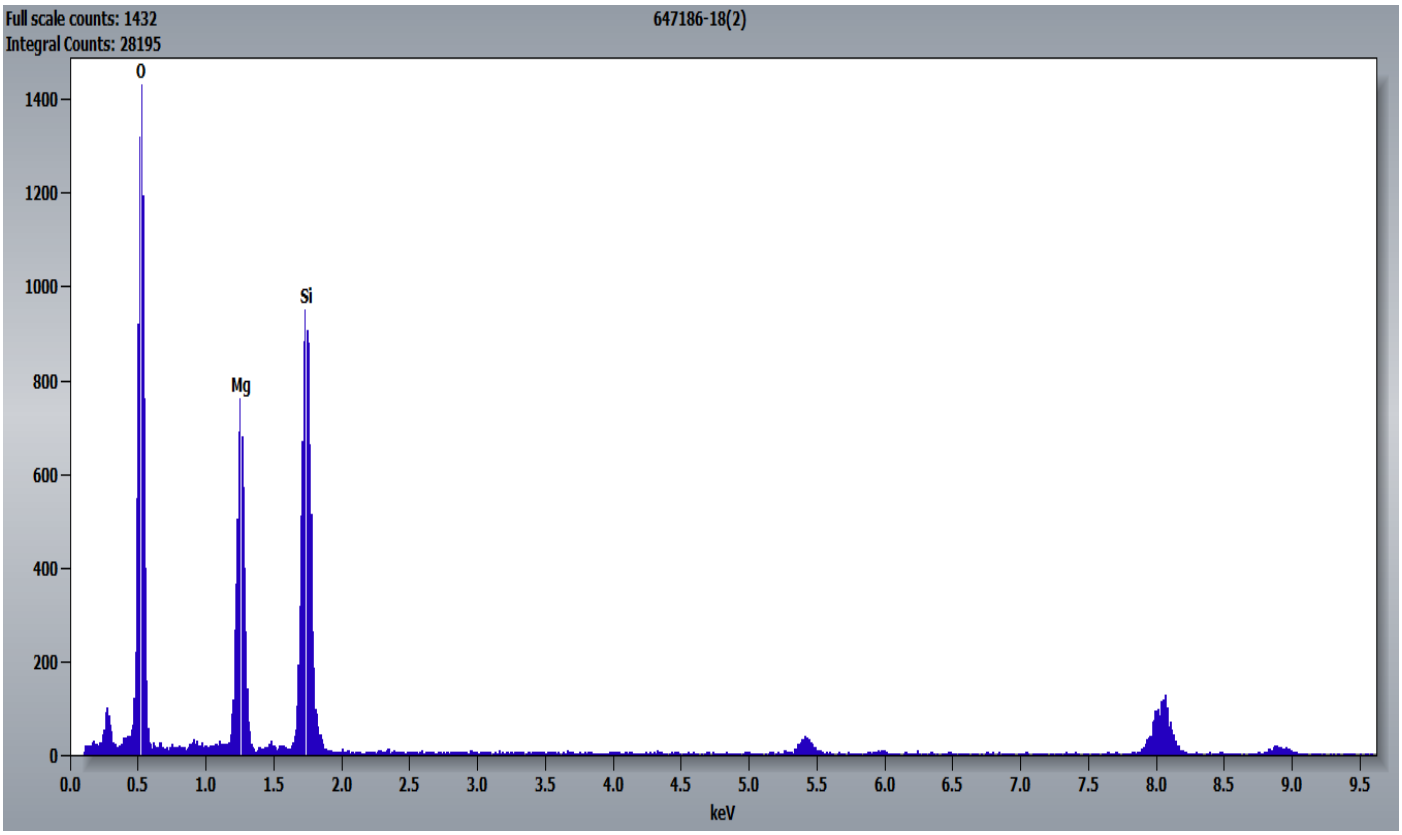


647186 FDA_180.jpg
647186-18
Talc particle

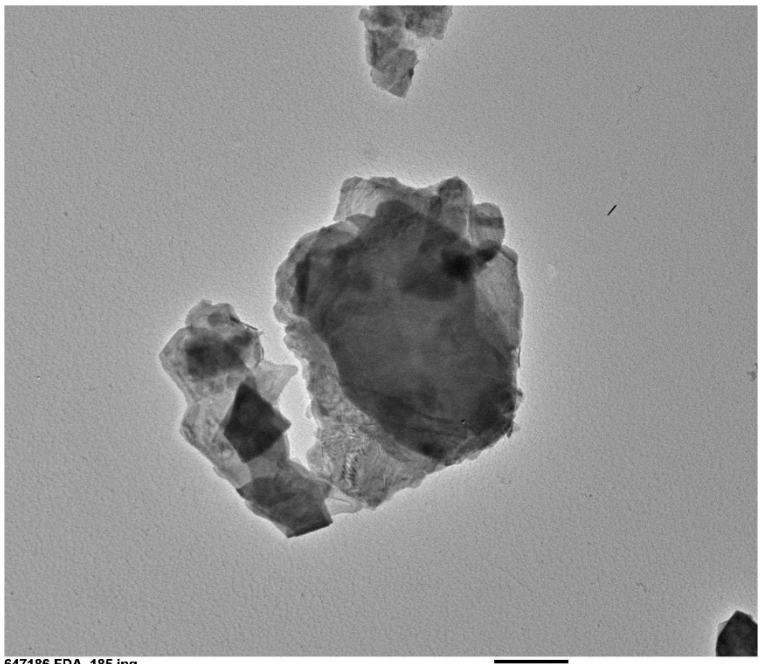
Cal: 0.003819 µm/pix
11:54 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle Pictured Above



647186-18, Mica Particle

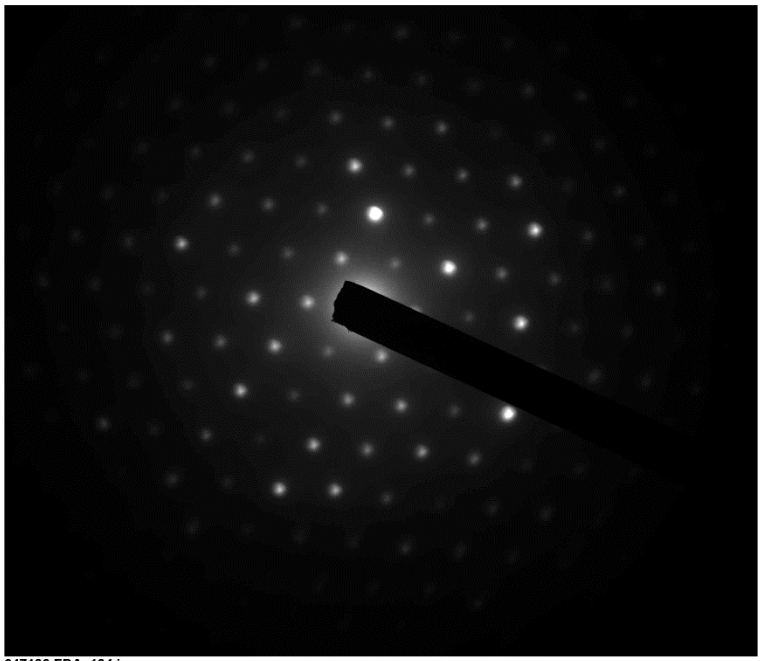


647186 FDA_185.jpg
647186-18
Mica particle

Cal: 0.003819 µm/pix
12:06 2023-08-31
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2500 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

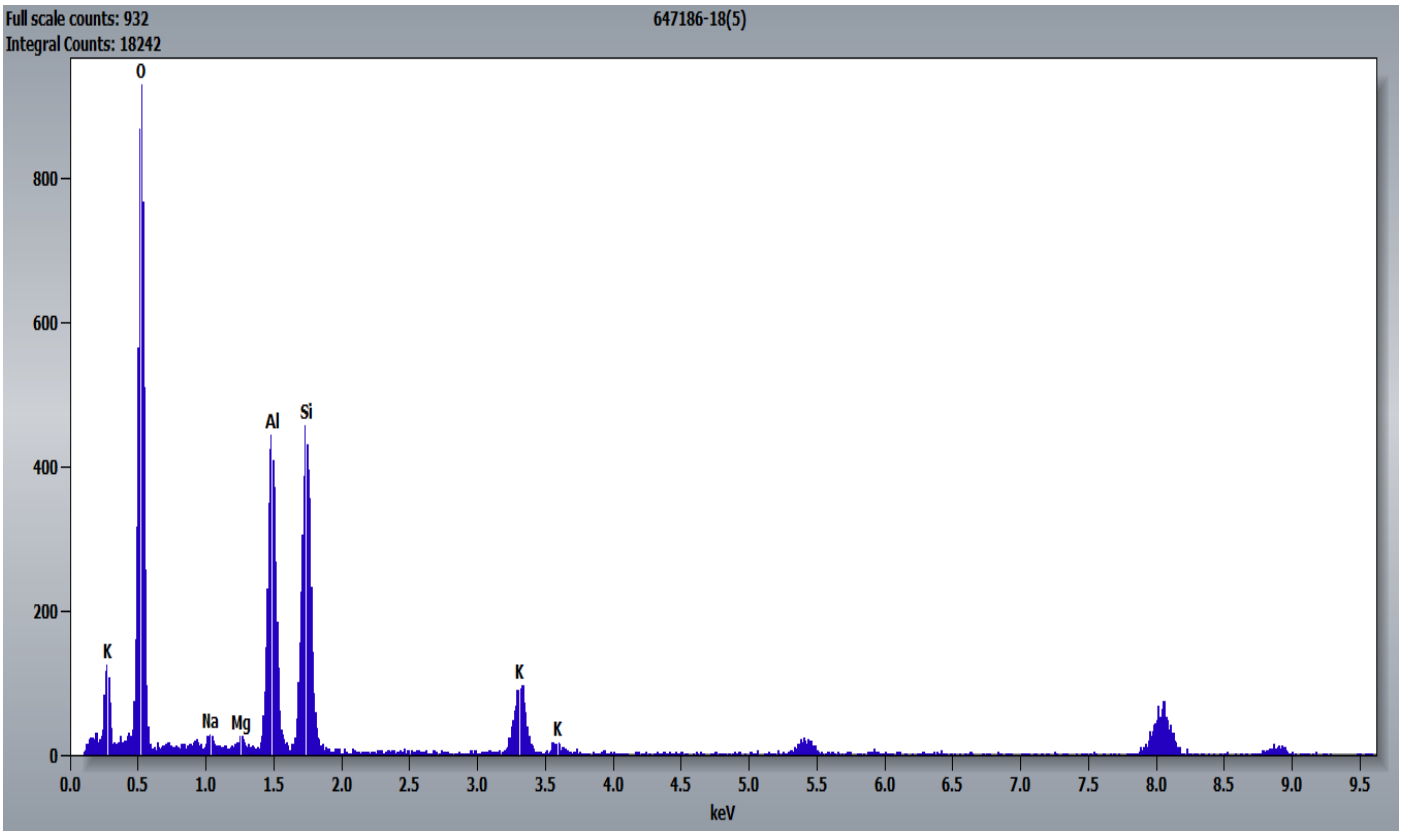


647186 FDA_184.jpg
647186-18
Mica particle

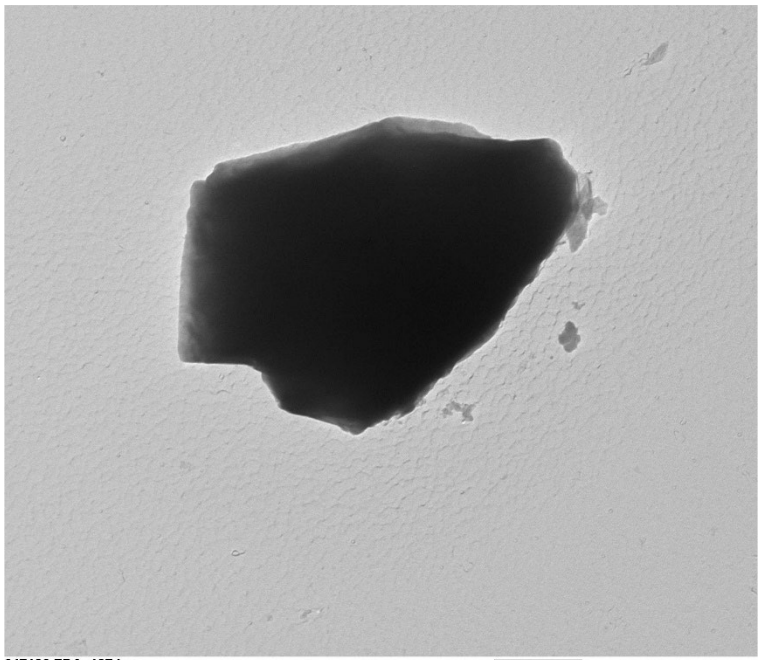
Cal: 0.002387 µm/pix
12:05 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

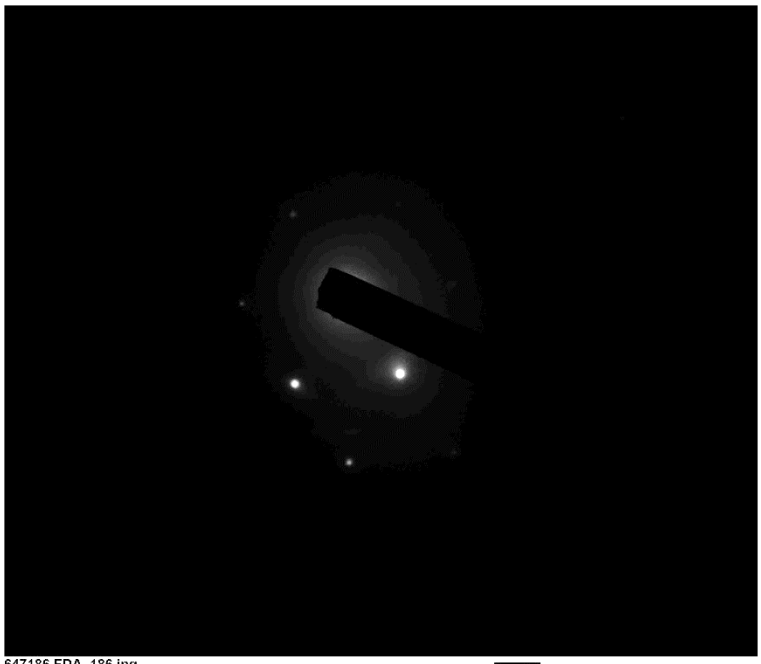
Chemistry from the Mica Particle Pictured Above



647186-18, Silicon Particle



Diffraction Pattern from the Silicon Particle Pictured Above

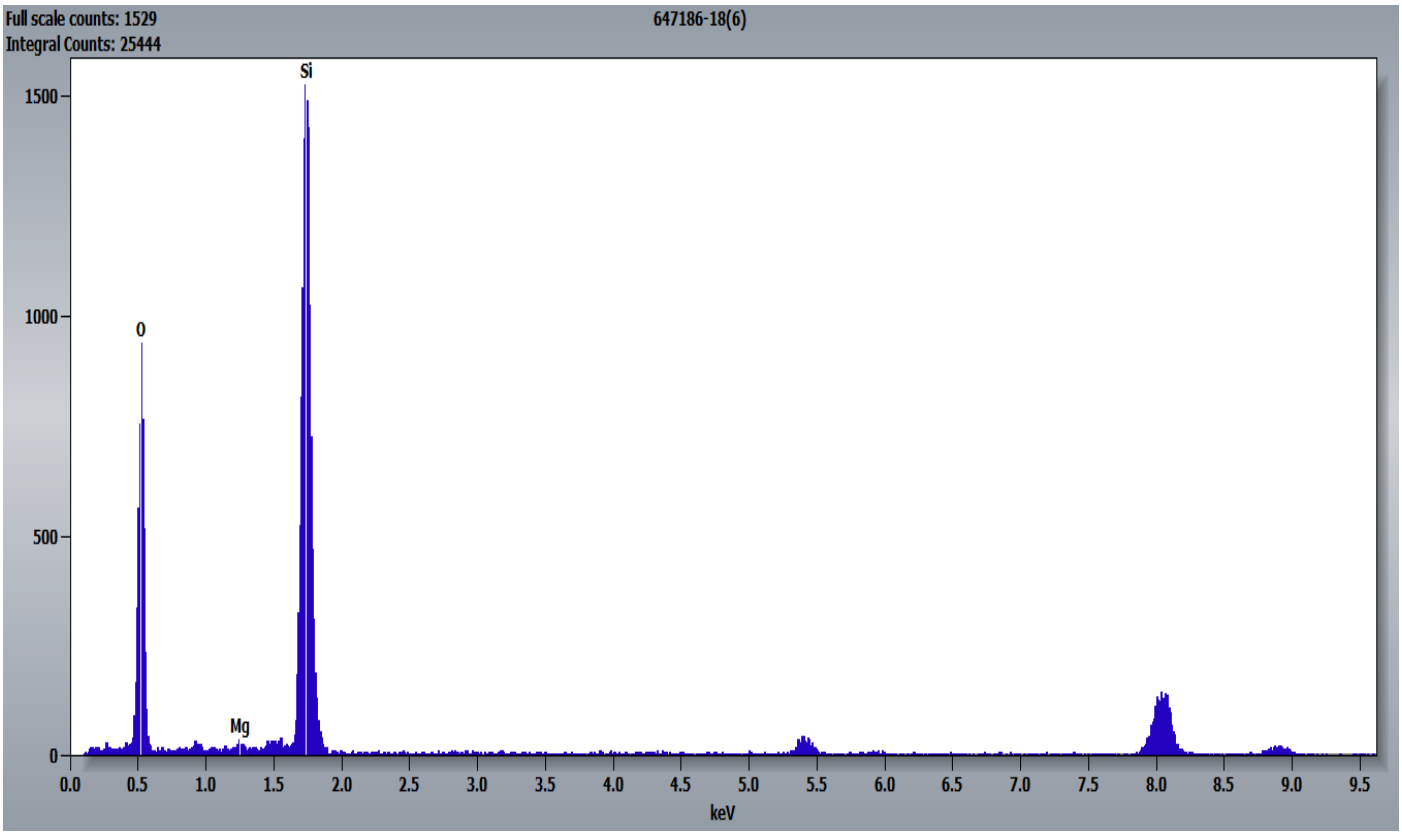


647186 FDA_186.jpg
647186-18
Si particle

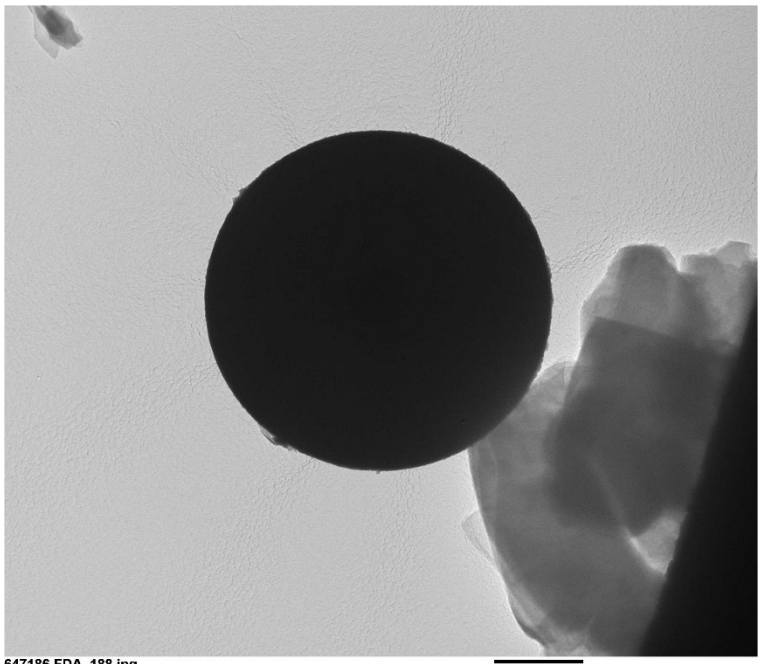
Cal: 0.003819 µm/pix
12:08 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

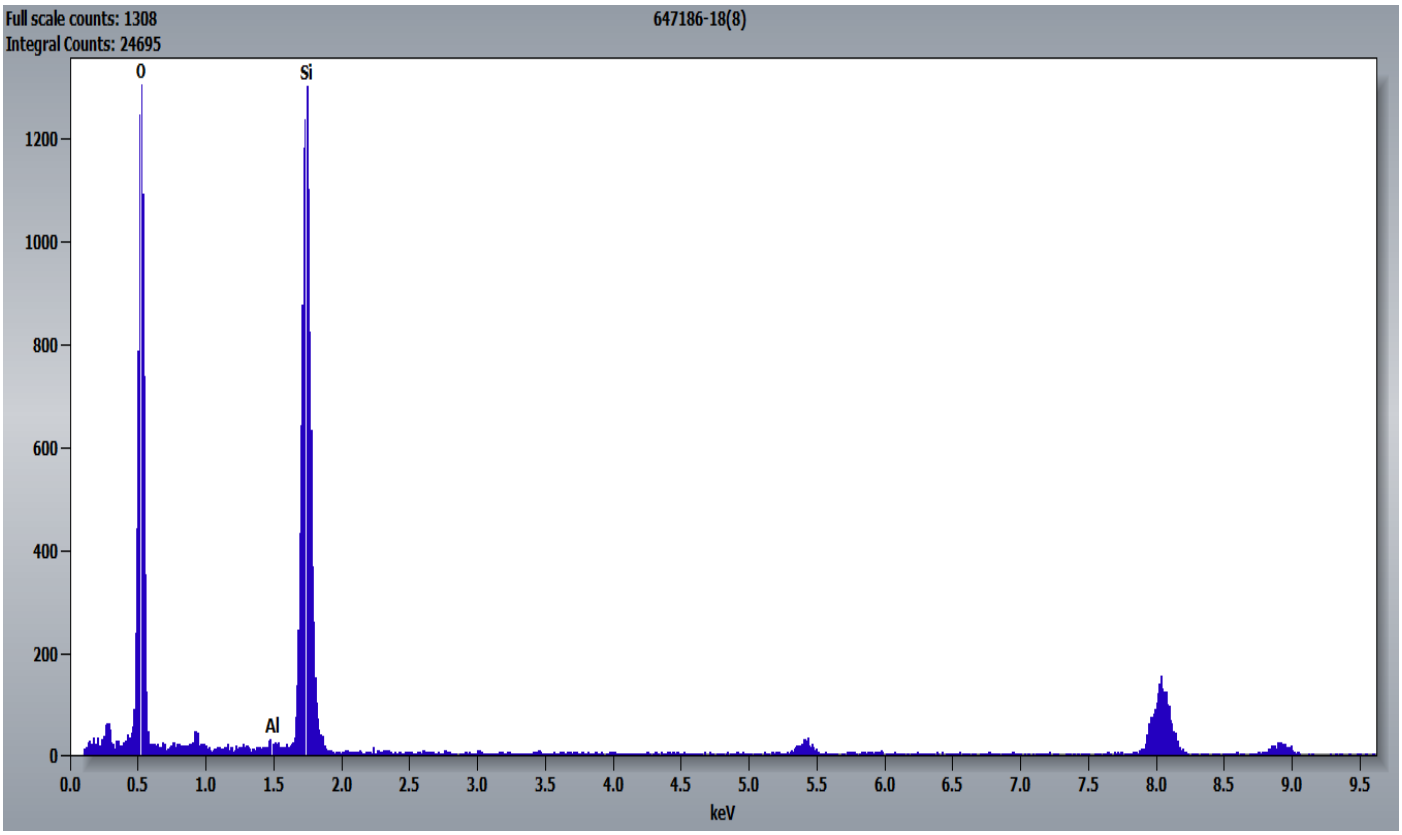
Chemistry from the Silicon Particle Pictured Above



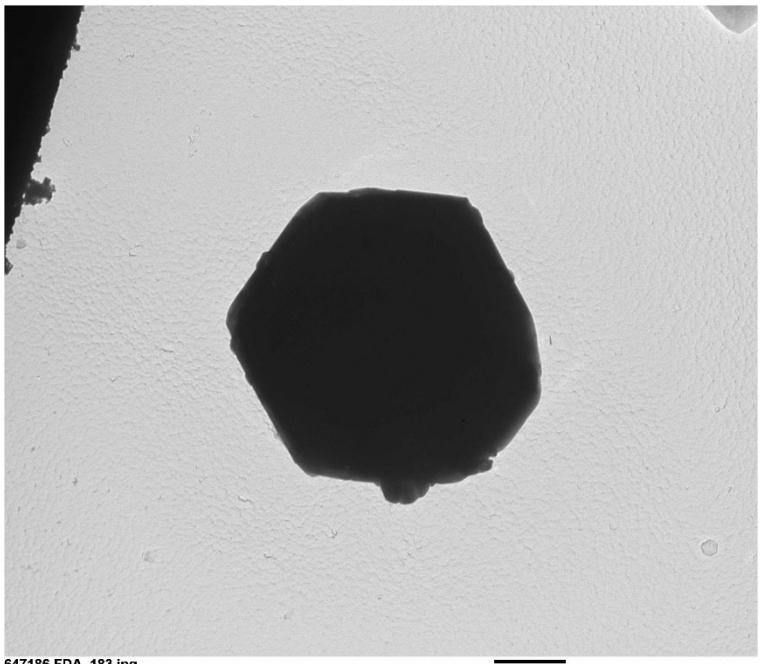
647186-18, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



647186-18, Chromium Particle

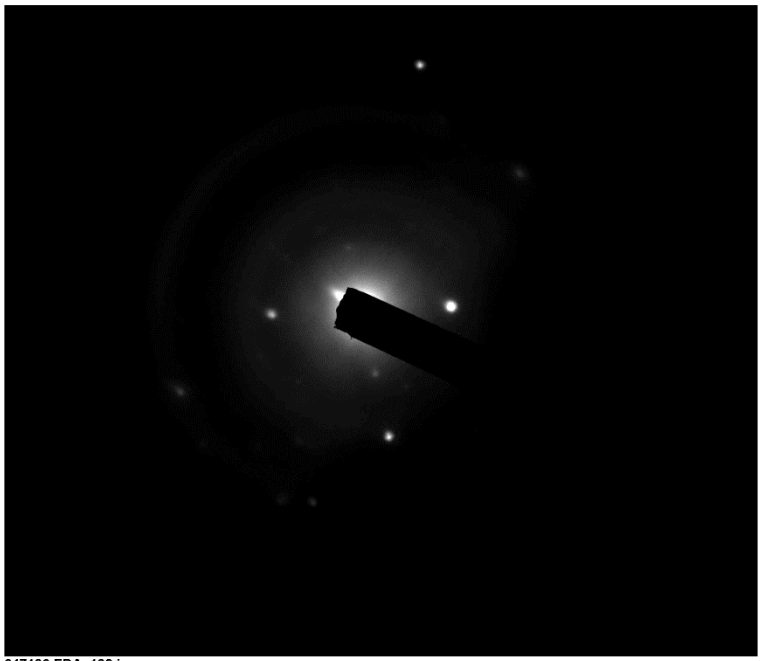


647186 FDA_183.jpg
647186-18
Cr particle

Cal: 0.002387 µm/pix
12:00 2023-08-31
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Diffraction Pattern from the Chromium Particle Pictured Above

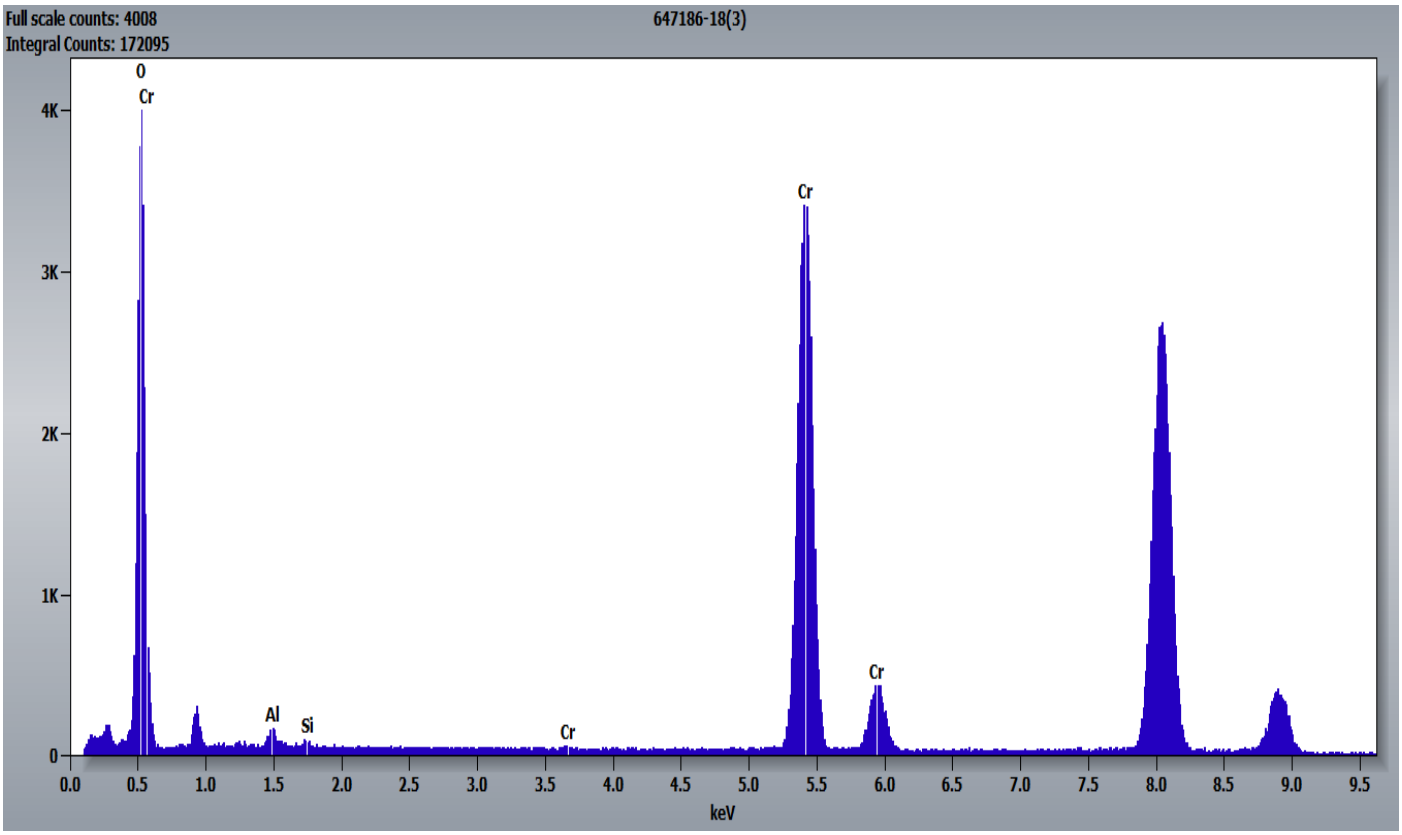


647186 FDA_182.jpg
647186-18
Cr particle

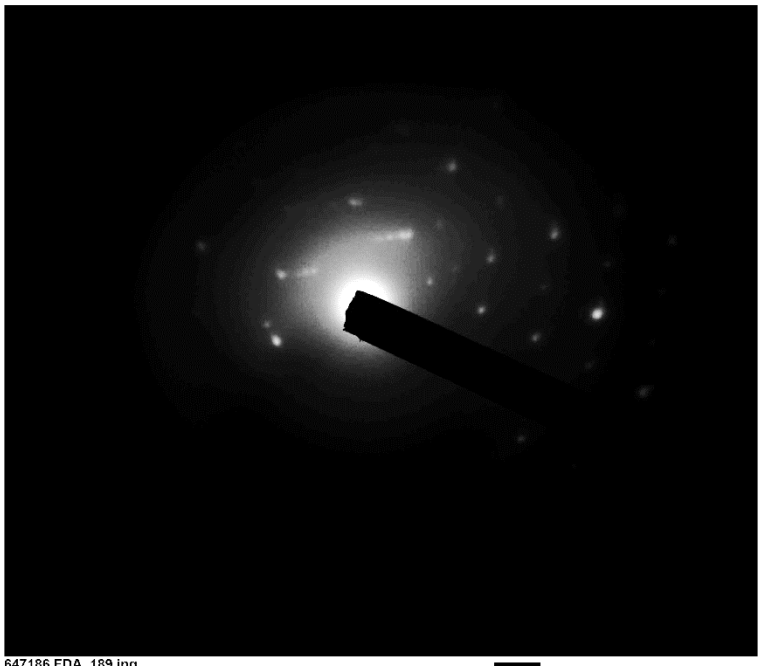
Cal: 0.001905 µm/pix
11:59 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Chromium Particle Pictured Above



647186-18, Diffraction Pattern from Talc Ribbon

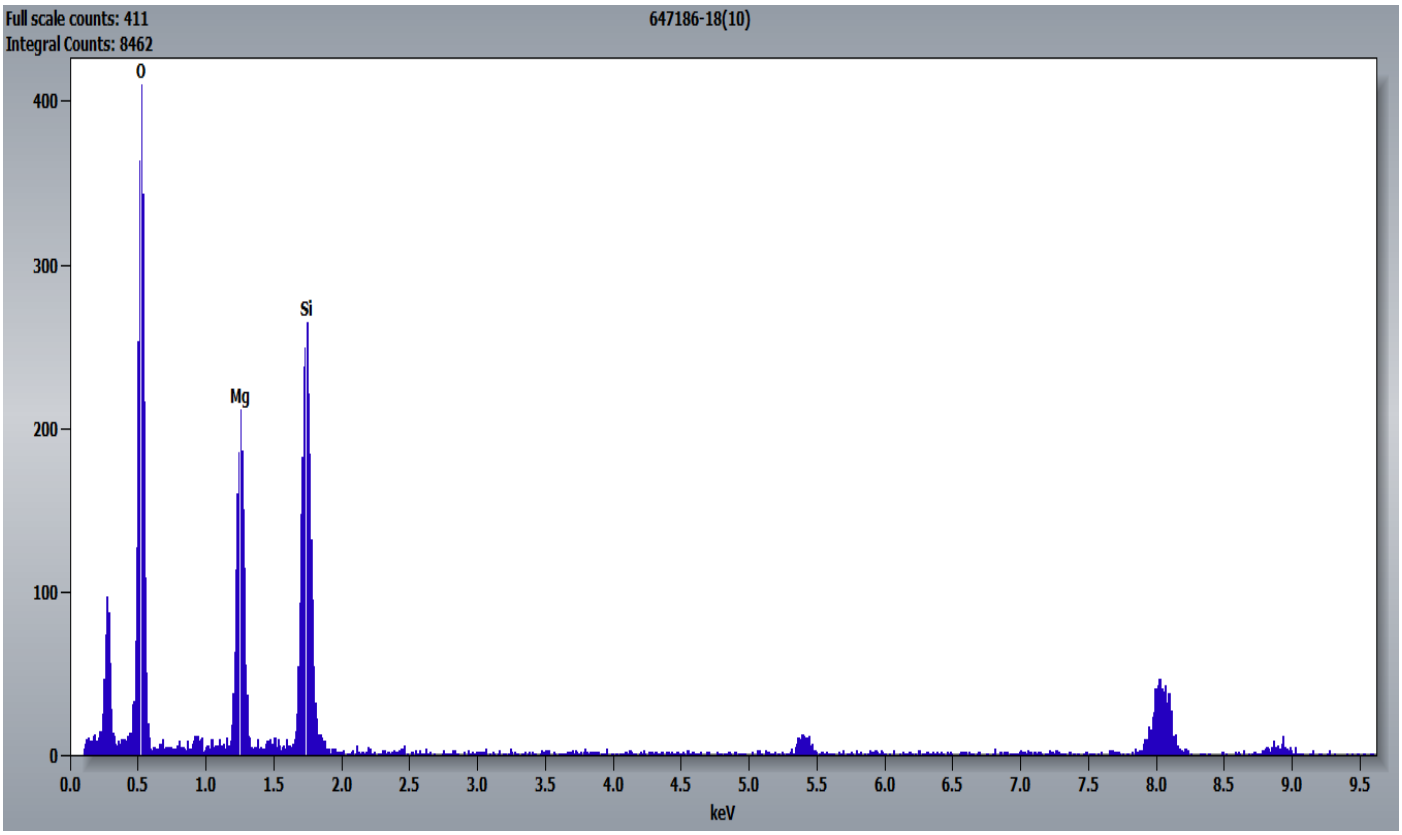


647186 FDA_189.jpg
647186-18
Talc Ribbon

Cal: 0.003183 µm/pix
12:39 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



647186-19, 19A, 19B/Client Sample: 05162023-19

PLM

All three aliquots of sample 05162023-19 were analyzed by (b) (6) on August 30, 2023. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-18	No Asbestos Detected
647186-18A	No Asbestos Detected
647186-18B	No Asbestos Detected

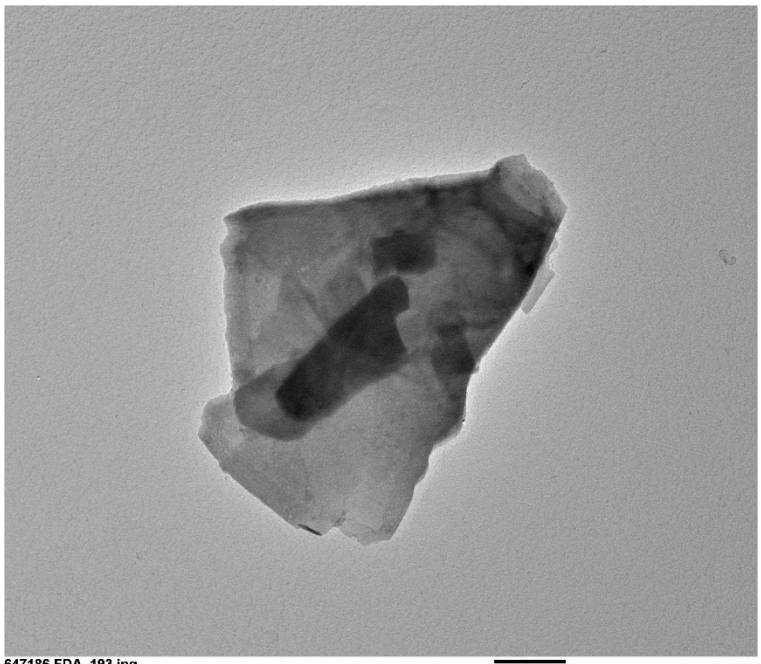
TEM

(b) (6) analyzed aliquot 19 on August 31, 2023. (b) (6) analyzed aliquot 19A on August 30, 2023, and aliquot 19B on August 31, 2023. The primary particles observed were talc and mica; talc ribbons/fibers were also observed along with silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

647186-18	No Asbestos Detected
647186-18A	No Asbestos Detected
647186-18B	No Asbestos Detected

Below are pictures, diffraction patterns, and chemistry from some of the observed particles. The copper peaks in the chemistry spectra are from the TEM grid. The unidentified (and some identified) peaks in the chemistry spectra are zinc and carbon from the TEM specimen holder.

647186-19, Talc Particle

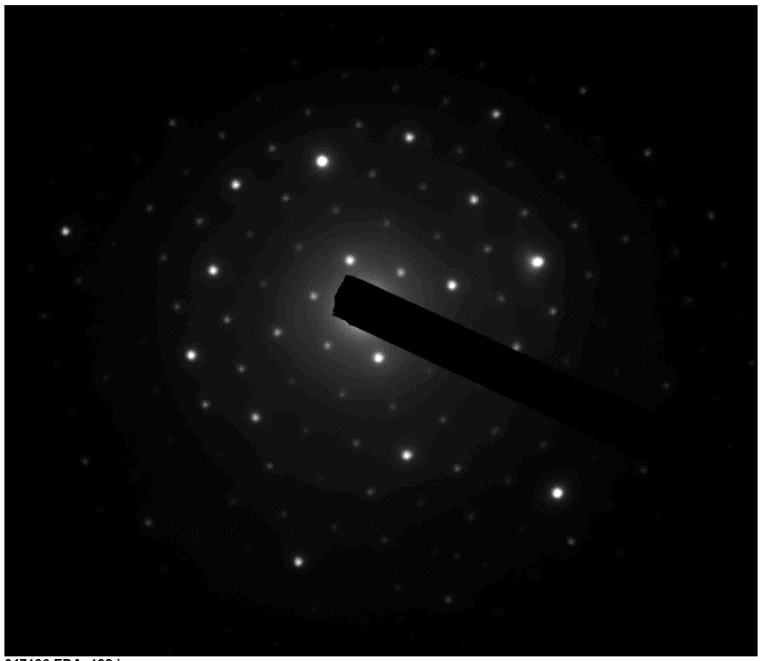


647186 FDA_193.jpg
647186-19
Talc particle

Cal: 0.002387 µm/pix
14:16 2023-08-31
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 4000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

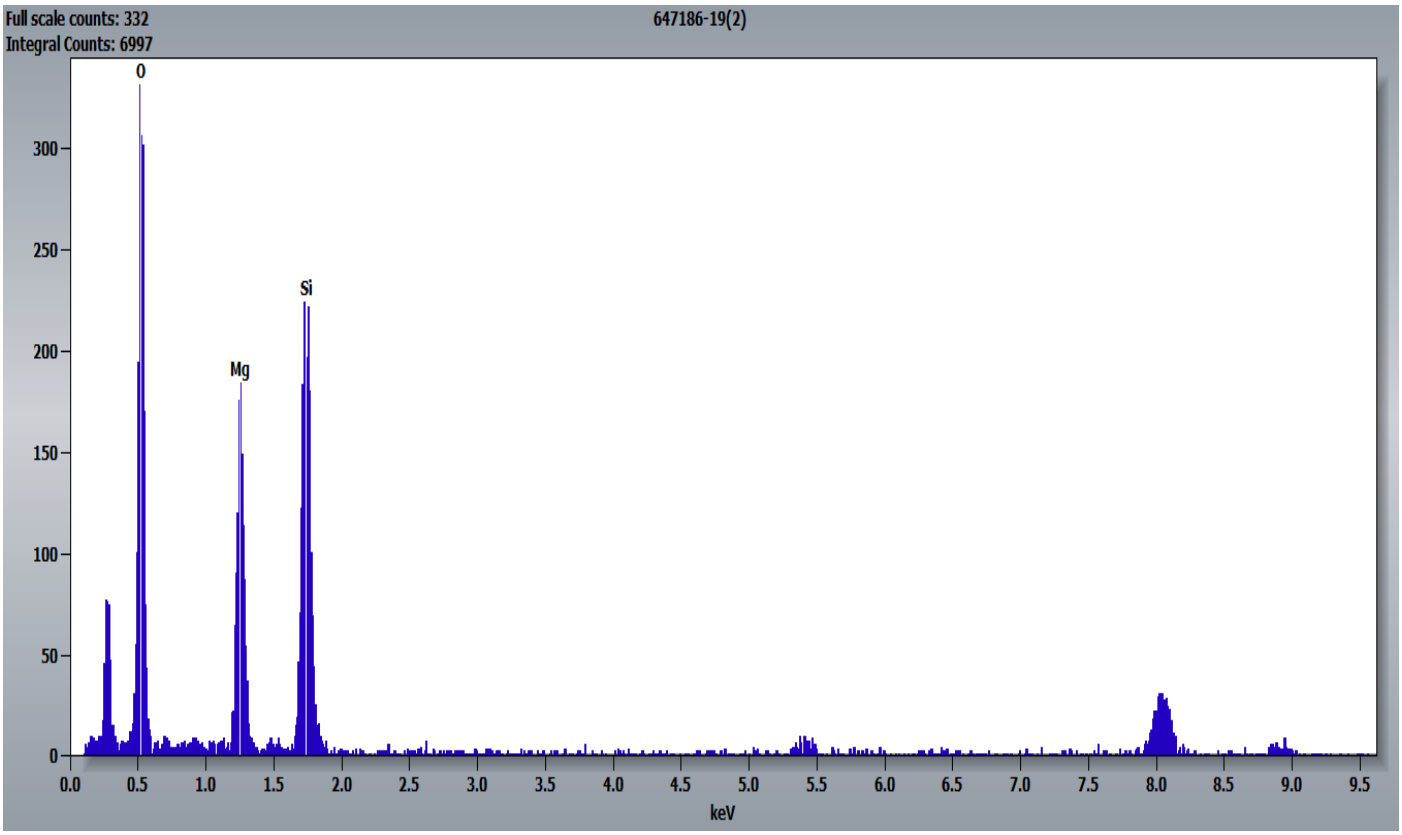


647186 FDA_192.jpg
647186-19
Talc particle

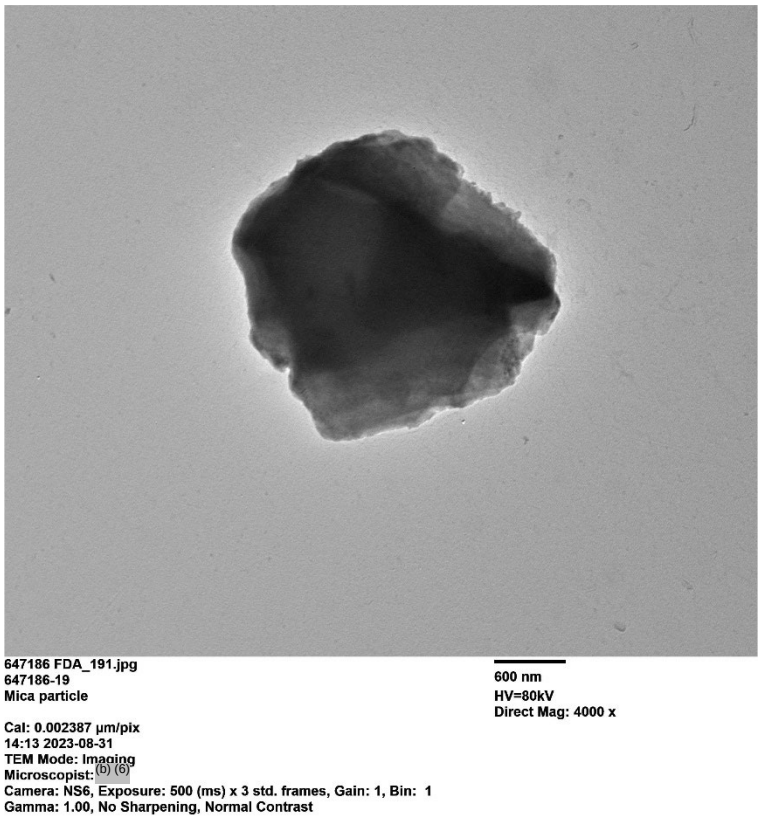
Cal: 0.002387 µm/pix
14:16 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

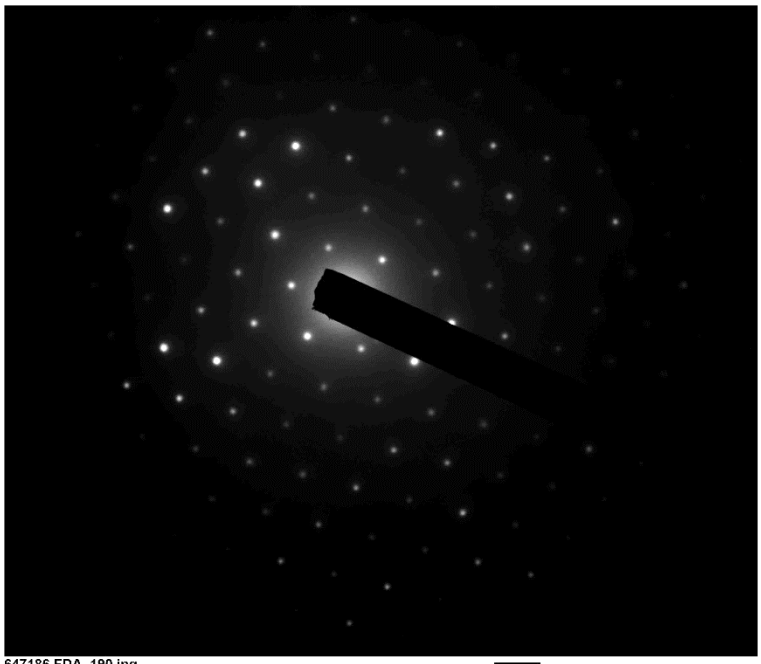
Chemistry from the Talc Particle Pictured Above



647186-19, Mica Particle



Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

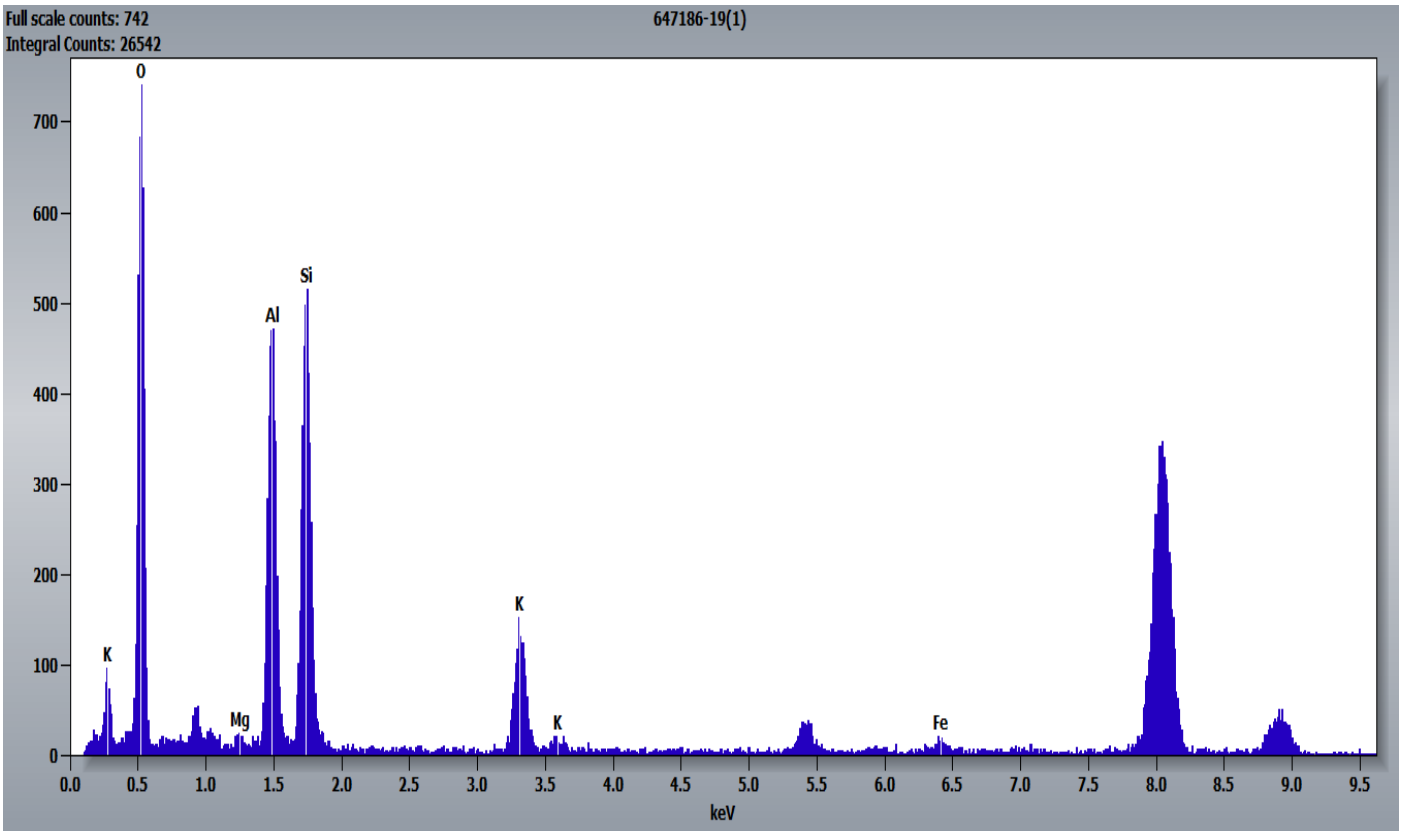


647186 FDA_190.jpg
647186-19
Mica particle

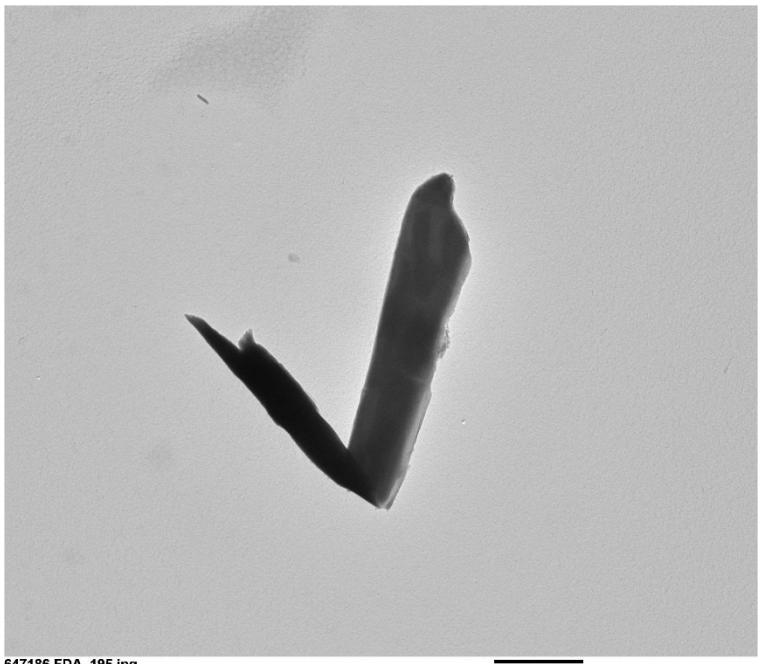
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

14:12 2023-08-31
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

Chemistry from the Mica Particle Pictured Above



647186-19, Talc Ribbon

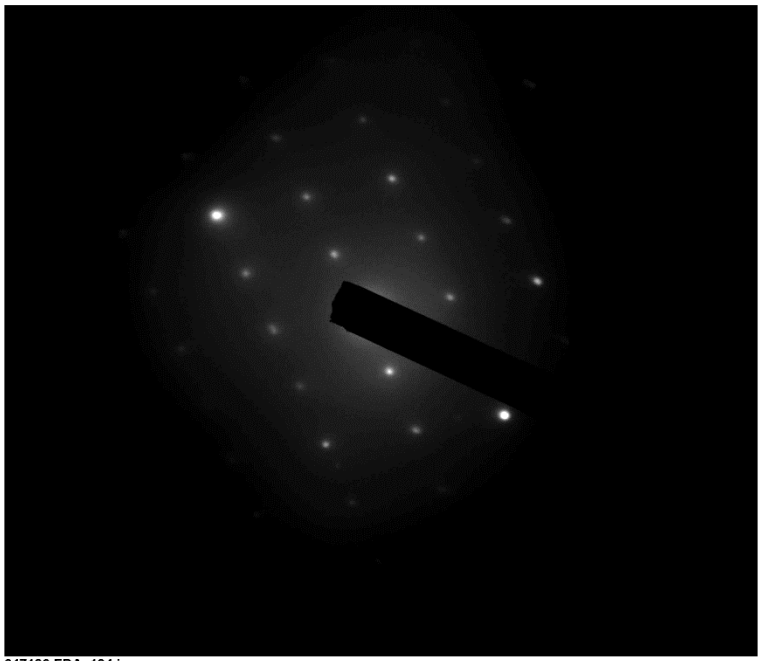


647186 FDA_195.jpg
647186-19
Talc ribbon

Cal: 0.003183 µm/pix
14:26 2023-08-31
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 3000 x

Diffraction Pattern from the Talc Ribbon Pictured Above

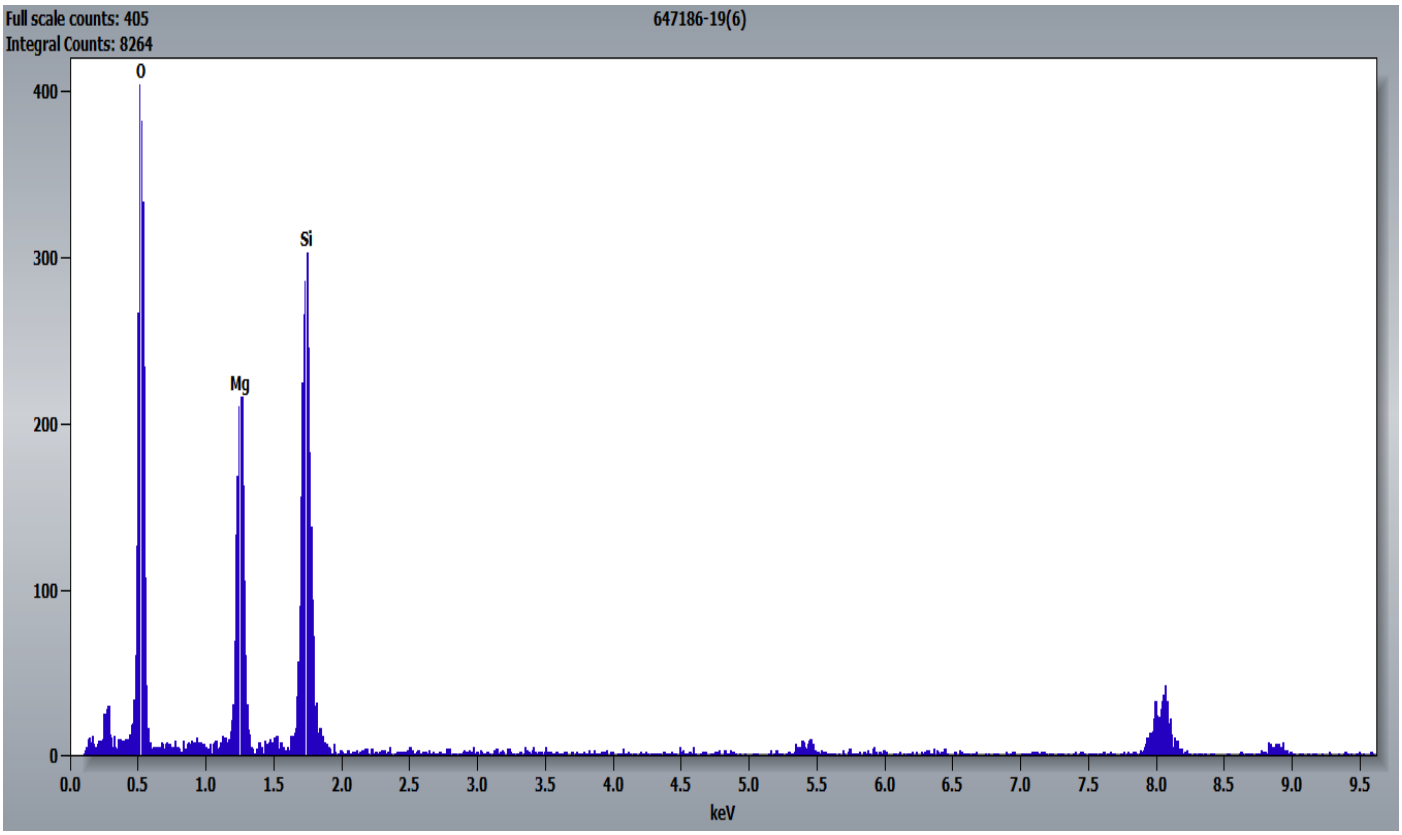


647186 FDA_194.jpg
647186-19
Talc ribbon

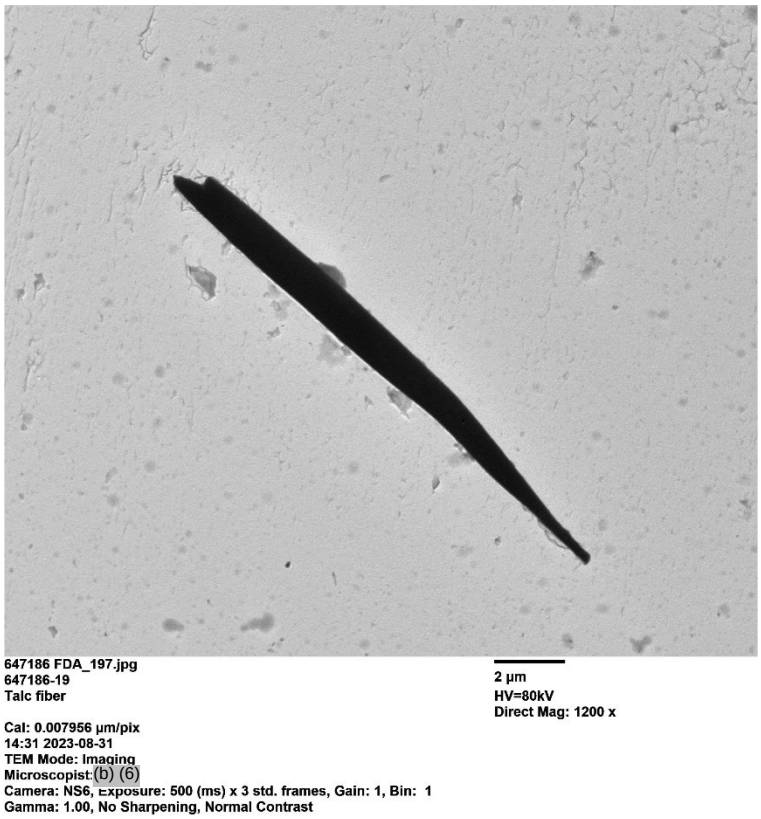
Cal: 0.002387 µm/pix
14:25 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

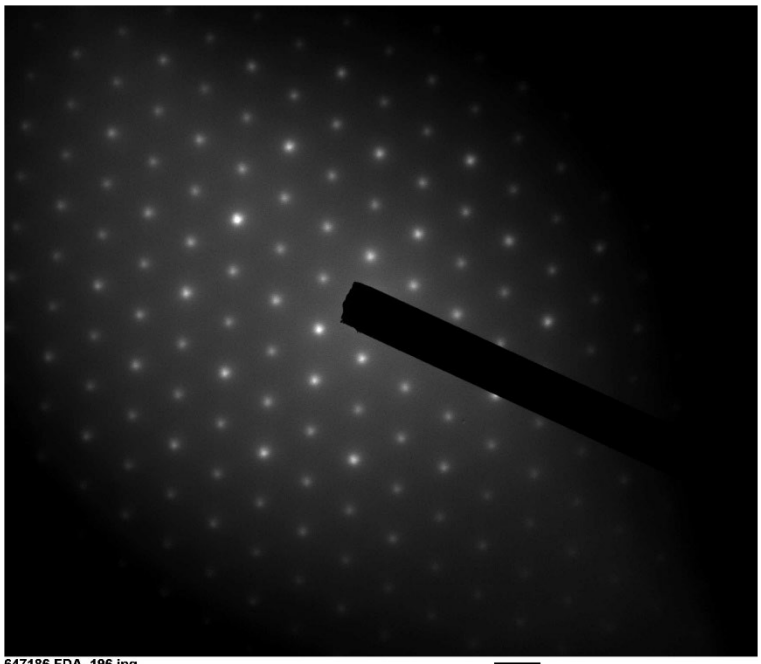
Chemistry from the Talc Ribbon Pictured Above



647186-19, Elongated Talc Particle



Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

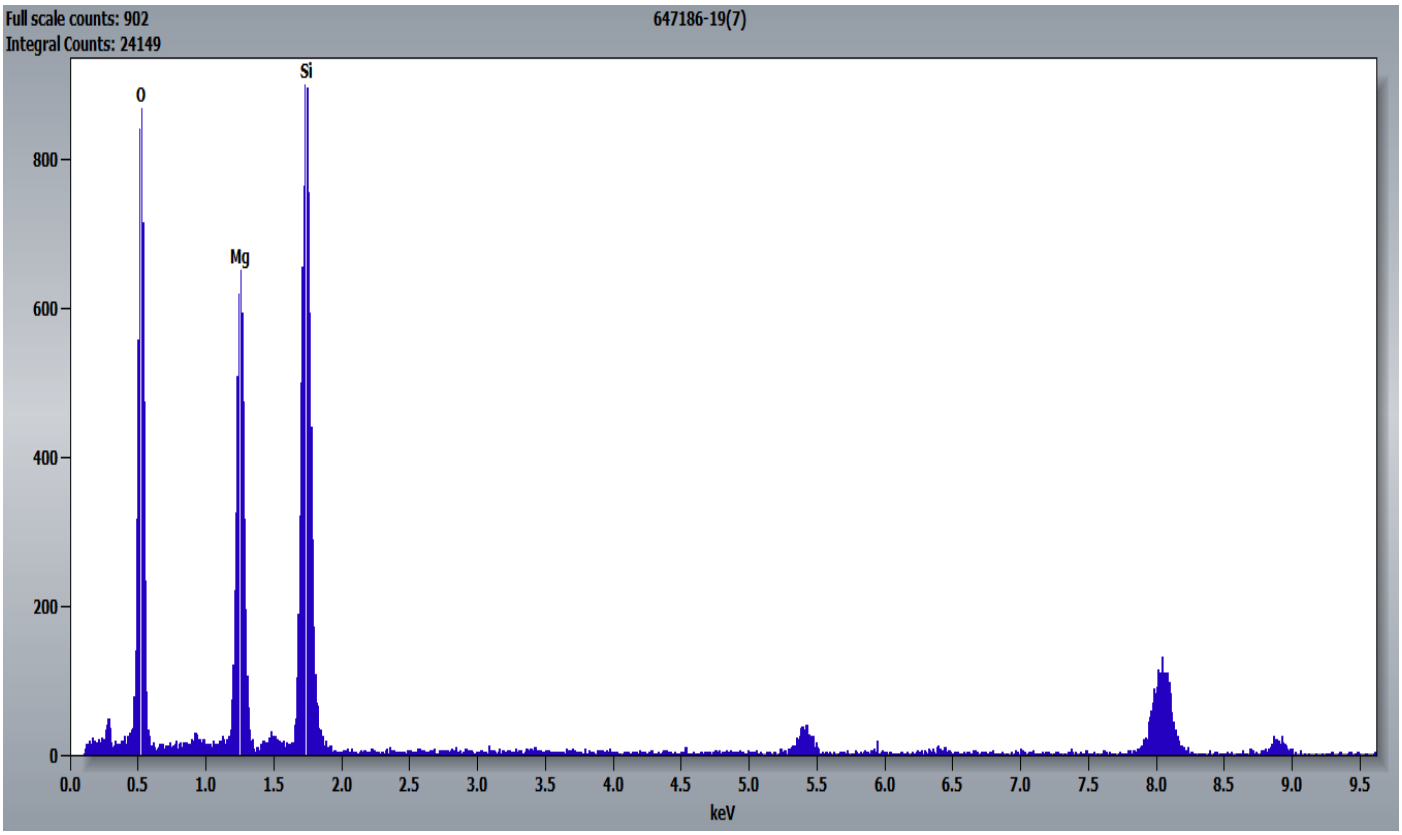


647186 FDA_196.jpg
647186-19
Talc fiber

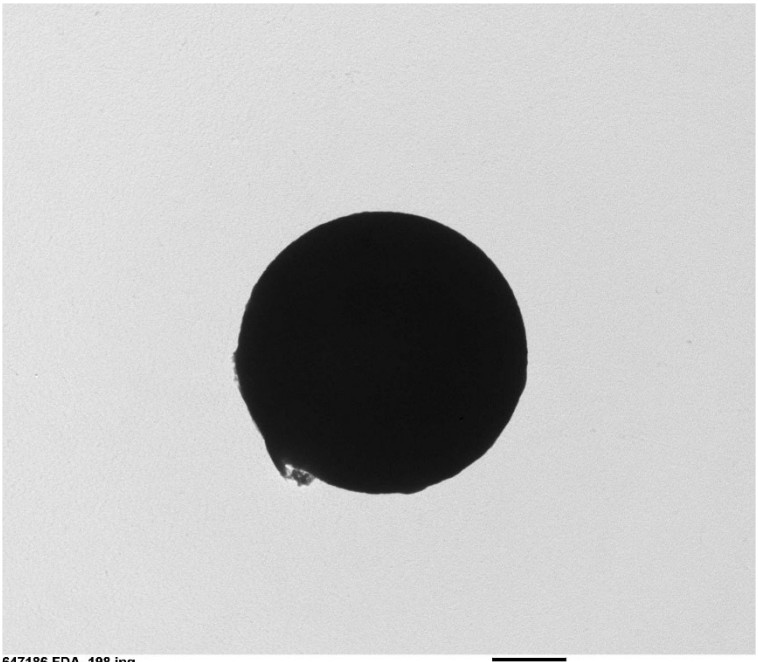
Cal: 0.003183 µm/pix
14:31 2023-08-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

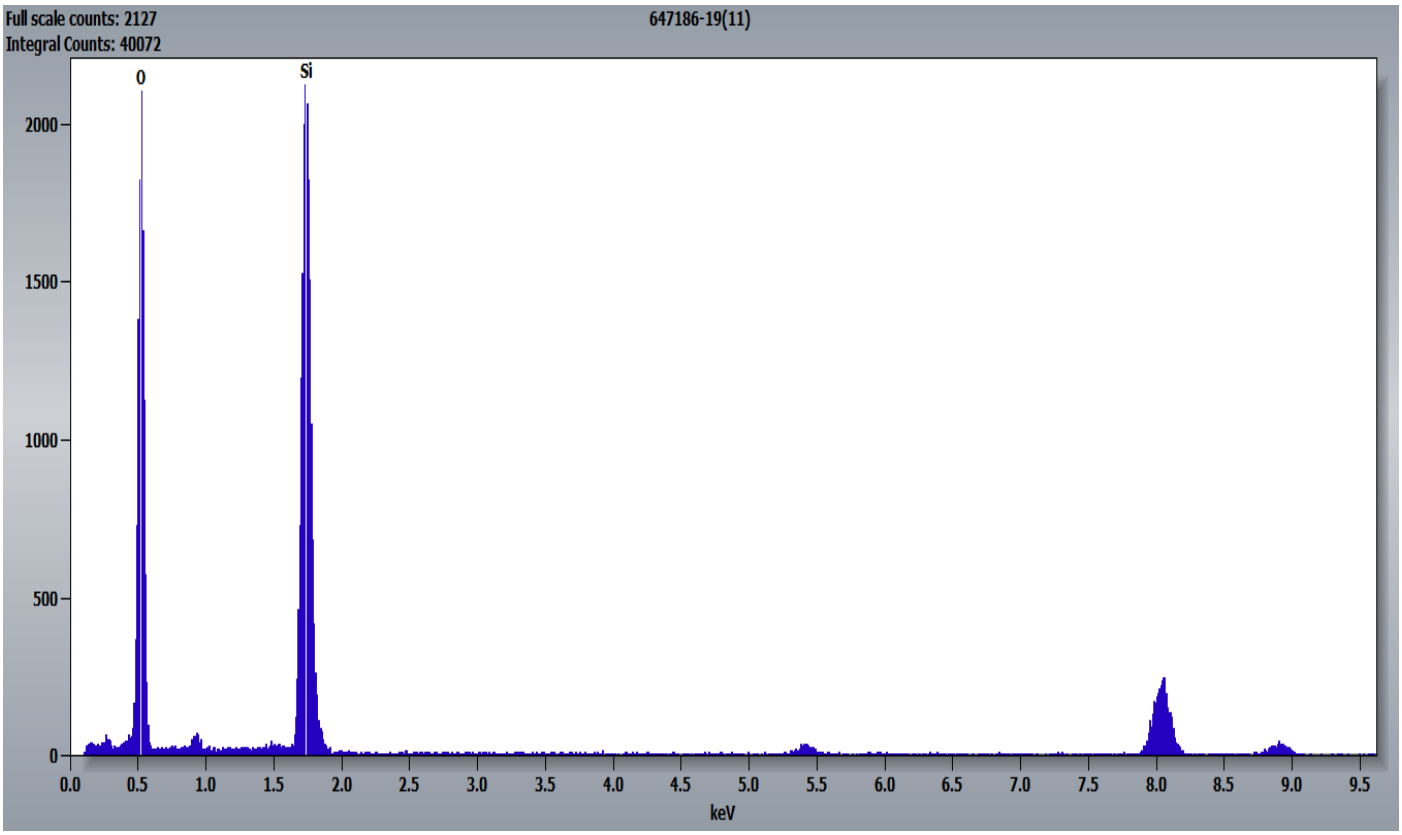
Chemistry from the Elongated Talc Particle Pictured Above



647186-19, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



QC Discussion

Microscope alignment and calibration for both the PLM and TEM scopes, and EDXA unit calibration were performed on each day of analysis as specified by method requirements and standard laboratory operating procedures. The analytical balance used for gravimetric reduction is verified weekly at three (3) tare levels using three NIST-traceable weights – 10.0-g, 0.1-g, 0.5-g – and on each day of operation using the 0.1-g and 0.5-g weights tared with an 8-mL glass vial. The muffle furnace is verified monthly at a temperature of 480°C. All equipment was functioning within normal operating parameters.

Matrix blank samples were prepared at rate of 10% or greater alongside the client samples with each series of samples that were put into the muffle furnace together. The matrix blank samples were prepared using Sigma-Aldrich Talc Powder 18654 (Cas No. 14807-96-6; EC No. 238-877-9, Lot 82330). Analysis of the matrix blank samples was only required if asbestos, or the non-asbestos versions of the regulated minerals, was found on the associated client samples unless otherwise noted. Matrix blank sample numbers NB23-439/440, NB23-449, NB23-453, NB23-458/459, NB23-467/468, and NB23-470/471 were not analyzed since no asbestos was observed on the associated client samples. (b) (6) analyzed matrix blank sample numbers NB23-448 and NB23-452 on September 20, 2023; no asbestos was detected on these samples.

A talc reference control sample was randomly selected from our library of TEM grid preparations made from Sigma-Aldrich Talc Powder, <10 micron (Product No. 643604-500G; Batch No. 10830AJ) spiked with various levels of Chrysotile ranging from 0.4%-10%. One (1) reference control sample, sample number 647186-RB1, was analyzed with this set. It was analyzed by (b) (6) on August 30, 2023, and found to be within acceptable limits.

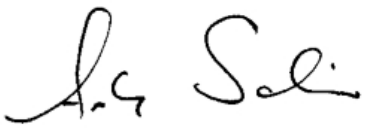
Filtration blank samples were prepared alongside the client samples with each use of the filtration apparatus. Analysis of these samples was only required on those blanks associated with a client sample on which asbestos, or the non-asbestos versions of the regulated minerals, was found unless otherwise noted. Filtration blank sample numbers 647186-DI1 through 647186-DI7, 647186-D9 through 647186-DI11, and 647186-DI13 through 647186-DI19 were not analyzed since no asbestos was observed on the associated client samples. (b) (6) analyzed filtration blank sample numbers 647186-DI8 and 647186-DI12 on September 20, 2023; no asbestos was detected on these samples.

TEM grid preparation (EB) blank samples were prepared with each batch of carbon coated filters. AMA policy is to analyze these blank samples whenever asbestos, or the non-asbestos versions of the regulated minerals, is detected on an associated client sample or when the laboratory blank identification number ends in a "0" or "5." EB blank IDs 60840, 60870, 60873, 60895, 60897, 60910, and 60925 were analyzed by (b) (6) on September 20, 2023. No asbestos was detected on the TEM grid preparation blanks samples that were analyzed.

Our laboratory information management system (LIMS) randomly selected sample 647186-19/05162023-19 for additional duplicate QC analysis. Independent preparations were made for the PLM and TEM portions of analysis. The duplicate QC analysis was performed by (b) (6) on August 30, 2023, for PLM and by (b) (6) on September 19, 2023, for TEM. The QC results were consistent with the original findings.

Our laboratory information management system (LIMS) randomly selected samples 647186-5/05162023-5 and 647186-7/05162023-7 for additional replicate QC analysis. Independent preparations were made for the PLM and TEM portions of analysis. The replicate QC analysis was performed by Surat Watson on August 30, 2023, for PLM, and by (b) (6) on September 7, 2023, through September 8, 2023, for TEM. The QC results were consistent with the original findings.

I certify that all information contained in this report pertaining to laboratory events, procedures, and protocols is true to the best of my knowledge and accurately describes the handling of this project by AMA Analytical Services, Inc., and its personnel.



10/13/2023

Andreas Saldivar — Date
President