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: 75F40122P000335

Assignment DFPG# 23-19, Batch No. 04032023 (Batch #1)
AMA COC No. 646090

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: 646090
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 1 (No. 04032023)
Job Number: CLIN 0001
PO Number: 75F40122P000335

Date Submitted: 4/13/2023
Date Analyzed: 5/30/2023 - 6/22/2023
Report Date: 8/22/2023
Date Sampled: Not Provided
Person Submitting: Sabrina McKinney
Revised:

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	% Tremolite by TEM Using ASTM D5756 Mass Calculation	% Total Chrysotile & Tremolite by TEM Using ASTM D5756 Mass Calculation	% Asbestos by PLM	% Organics	% Acid Soluable	% Other	Comments
646090-1A	04032023-1	0.00000313%	0.00001253%	ND	ND	< 0.00001%	ND	23.45%	22.58%	53.97%	
646090-1B	04032023-1	0.00000363%	0.00001450%	ND	ND	< 0.00001%	ND	23.38%	21.86%	54.77%	
646090-1C	04032023-1	0.00000517%	0.00002070%	ND	ND	< 0.00002%	ND	23.37%	24.54%	52.09%	
646090-2A	04032023-2	0.00000506%	0.00002022%	ND	ND	< 0.00002%	ND	21.53%	6.70%	71.77%	
646090-2B	04032023-2	0.00000518%	0.00002074%	ND	ND	< 0.00002%	ND	21.52%	9.64%	68.84%	
646090-2C	04032023-2	0.00000368%	0.00001471%	ND	ND	< 0.00001%	ND	21.58%	8.24%	70.18%	
646090-3A	04032023-3	0.00000351%	0.00001406%	ND	ND	< 0.00001%	ND	9.18%	10.71%	80.11%	
646090-3B	04032023-3	0.00000549%	0.00002197%	ND	ND	< 0.00002%	ND	9.16%	11.18%	79.66%	
646090-3C	04032023-3	0.00000380%	0.00001521%	ND	ND	< 0.00002%	ND	9.28%	9.62%	81.11%	
646090-4A	04032023-4	0.00000414%	0.00001657%	ND	ND	< 0.00002%	ND	12.77%	8.70%	78.54%	
646090-4B	04032023-4	0.00000410%	0.00001639%	ND	ND	< 0.00002%	ND	12.86%	9.42%	77.72%	
646090-4C	04032023-4	0.00000374%	0.00001497%	ND	ND	< 0.00001%	ND	12.45%	9.81%	77.74%	
646090-5A	04032023-5	0.00000563%	0.00002253%	ND	ND	< 0.00002%	ND	0.18%	11.05%	88.77%	
646090-5B	04032023-5	0.00000471%	0.00001883%	ND	ND	< 0.00002%	ND	0.18%	8.90%	90.92%	
646090-5C	04032023-5	0.00000550%	0.00002202%	ND	ND	< 0.00002%	ND	0.17%	9.14%	90.69%	
646090-6A	04032023-6	0.00000504%	0.00002015%	ND	ND	< 0.00002%	ND	26.94%	9.34%	63.73%	
646090-6B	04032023-6	0.00000444%	0.00001775%	ND	ND	< 0.00002%	ND	26.90%	8.14%	64.96%	
646090-6C	04032023-6	0.00000343%	0.00001370%	ND	ND	< 0.00001%	ND	26.94%	8.53%	64.52%	
646090-7A	04032023-7	0.00000396%	0.00001584%	ND	ND	< 0.00002%	ND	20.95%	10.66%	68.40%	
646090-7B	04032023-7	0.00000463%	0.00001851%	ND	ND	< 0.00002%	ND	20.96%	9.88%	69.15%	
646090-7C	04032023-7	0.00000488%	0.00001953%	ND	ND	< 0.00002%	ND	21.02%	9.71%	69.27%	
646090-8A	04032023-8	0.00000509%	0.01872612%	ND	< 0.01873%	< 0.01873%	ND	13.44%	11.40%	75.15%	
646090-8B	04032023-8	0.00000586%	0.00002343%	ND	ND	< 0.00002%	ND	13.45%	10.85%	75.70%	
646090-8C	04032023-8	0.00000517%	0.00347711%	ND	< 0.00348%	< 0.00348%	ND	13.48%	12.65%	73.86%	
646090-9A	04032023-9	0.00000586%	0.00002346%	ND	ND	< 0.00002%	ND	12.12%	18.48%	69.41%	
646090-9B	04032023-9	0.00001237%	0.00004950%	ND	ND	< 0.00005%	ND	12.07%	19.18%	68.75%	
646090-9C	04032023-9	0.00000565%	0.00002260%	ND	ND	< 0.00002%	ND	12.06%	18.68%	69.26%	
646090-10A	04032023-10	0.00000785%	0.00003139%	ND	ND	< 0.00003%	ND	4.43%	11.51%	84.06%	
646090-10B	04032023-10	0.00000602%	0.00002409%	ND	ND	< 0.00002%	ND	4.45%	11.76%	83.79%	
646090-10C	04032023-10	0.00000706%	0.00002826%	ND	ND	< 0.00003%	ND	4.49%	10.13%	85.38%	
646090-11A	04032023-11	0.00000445%	0.00001779%	ND	ND	< 0.00002%	ND	11.63%	5.68%	82.69%	
646090-11B	04032023-11	0.00000390%	0.00001558%	ND	ND	< 0.00002%	ND	11.65%	5.76%	82.59%	
646090-11C	04032023-11	0.00000330%	0.00001320%	ND	ND	< 0.00001%	ND	11.66%	5.83%	82.51%	
646090-12A	04032023-12	0.00000505%	0.00002018%	ND	ND	< 0.00002%	ND	17.48%	7.45%	75.07%	
646090-12B	04032023-12	0.00000467%	0.00001867%	ND	ND	< 0.00002%	ND	17.42%	6.39%	76.18%	
646090-12C	04032023-12	0.00000541%	0.00002162%	ND	ND	< 0.00002%	ND	17.43%	7.12%	75.44%	
646090-13A	04032023-13	0.00000491%	0.00001964%	ND	ND	< 0.00002%	ND	2.43%	2.79%	94.78%	
646090-13B	04032023-13	0.00000496%	0.00001984%	ND	ND	< 0.00002%	ND	2.37%	2.53%	95.10%	
646090-13C	04032023-13	0.00000554%	0.00002216%	ND	ND	< 0.00002%	ND	2.44%	2.76%	94.80%	
646090-14	04032023-14.1	0.00000193%	0.00000773%	ND	ND	< 0.00001%	ND	45.02%	3.82%	51.16%	
646090-15	04032023-14.2	0.00000185%	0.00000739%	ND	ND	< 0.00001%	ND	48.66%	3.73%	47.61%	

AMA Analytical Services, Inc.

Focused On Results. **CERTIFICATE OF ANALYSIS**

Chain of Custody: 646090
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 1 (No. 04032023)
Job Number: CLIN 0001
PO Number: 75F40122P000335

Date Submitted: 4/13/2023
Date Analyzed: 5/30/2023 - 6/22/2023
Report Date: 8/22/2023
Date Sampled: Not Provided
Person Submitting: Sabrina McKinney
Revised:

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	% Tremolite by TEM Using ASTM D5756 Mass Calculation	% Total Chrysotile & Tremolite by TEM Using ASTM D5756 Mass Calculation	% Asbestos by PLM	% Organics	% Acid Soluable	% Other	Comments
646090-16	04032023-14.3	0.00000168%	0.00000673%	ND	ND	< 0.00001%	ND	48.76%	3.87%	47.38%	

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 646090

Record Changes Report

Date	Description
8/25/2023	P. 77: The word “Csection” was corrected to read “Calculations section” in the PLM analytical findings paragraph for sample 646090-4/04032023-4.

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.) **646090**

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 1 (No. 04032023
Job #: CLIN 1001 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: 5/31/2023 ✓ 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 _____(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 thru 14.4	3	13 '1-oz glass jars submitted in pink vacuum sealed plastic bags	
		and 4 (4/sample) 50mL plastic centrifuge tubes in pink vacuum	
		sealed sealed plastic bags with custody seals intact (sealed by	
		Sabrina McKinney & Andrea Heise 4/3/2023-4/11/2023)	
		See attached FDA COC for additional details.	

	Print Name	Sign Name	Date	Time	Shipping Information
Relinquised by:					✓ UPS ☐ In-Person ☐ Other ☐ FedEx ☐ Drop Box ☐ USPS ☐ Courier
Received by:	(b) (6)		4/13/2023	09:35	(b) (6)

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

April 12, 2023

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

Re: Samples for Asbestos Analysis, Batch #04032023

Dear (b) (6) :

Enclosed in the box are thirteen vials of approx. 5-g solid product and four tubes (from one sample) of approx. 30 mL of liquid product 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 fourteen samples in this shipment constitute Batch 1 (No. 04032023) 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: ___04032023_____

Submitter: _____Sabrina M McKinney__Andrea S Heise_____

Assignment No./ Contract No.:___DFPG# 23-19 / #75F40122P00335_____

AMA COC No.: _____

Date Sealed: ____4/12/23_____ Sample Type: _Official Samples_____

Description of Evidence		
Item #	**Quantity**	**Description of Item** (Lab#, Lot #, Condition)
04032023-1	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-2	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-3	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-4	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-5	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-6	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-7	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-8	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-9	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-10	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-11	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-12	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-13	1 vial	Approx. 5 g of prepared talc-containing cosmetic sample
04032023-14.1 to 14.4	4 tubes	4 tubes of ~30 mL each of liquid product

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**
0403202 3-1 – 14.4	4/12/23	Sabrina McKinney	Sabrina McKinney	ORA DENL HAF

Chain of Custody				
Item #	**Date/Time**	**Received by** (Print Name)	**Received by** (Signature)	**Comments/Location**
1-14.4	4/13/2023 0935	(b) (6)	(b) (6)	AMA

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: _____

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
0403202 3-1 – 14.4	4/12/23	Sabrina McKinney	Sabrina McKinney	ORA DENL HAF

Chain of Custody

Item #	Date/Time	Received by (Print Name)	Received by (Signature)	Comments/Location
1-14.4	4/13/2023 0935	(b) (6)		AMA

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: _____

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

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
1.00 LBS

Service
UPS Next Day Air®

Shipped / Billed On
04/09/2021

Delivered On
04/12/2021 9:41 A.M.

Delivered To
LANHAM, MD, US

Received By
(b) (6)

Left At
Reception

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 04/12/2021 6:06 P.M. EST

Dana Hudson Nicodemus

From: UPS <pkginfo@ups.com>
Sent: Monday, April 12, 2021 6:08 PM
To: (b) (6)
Subject: UPS Status Notification, Tracking Number (b) (6)

Please see below for package information and current transit status.
Scheduled Delivery Date: Monday, 04/12/2021

Shipment Details

Tracking Detail

Your package is on time with a scheduled delivery date of 04/12/2021

Tracking Number:	(b) (6)
Status:	Delivered
Scheduled Delivery:	04/12/2021
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	04/12/2021	09:41 AM	DELIVERED

1

Landover, MD, United States	04/12/2021	09:17 AM	Out For Delivery Today
Landover, MD, United States	04/12/2021	04:56 AM	Loaded on Delivery Vehicle
Landover, MD, United States	04/12/2021	04:03 AM	Processing at UPS Facility
Landover, MD, United States	04/11/2021	11:45 PM	Arrived at Facility
Laurel, MD, United States	04/11/2021	11:16 PM	Departed from Facility
Laurel, MD, United States	04/11/2021	02:22 PM	Processing at UPS Facility
Laurel, MD, United States	04/11/2021	11:49 AM	Arrived at Facility
Rockford, IL, United States	04/10/2021	09:40 PM	Departed from Facility
Rockford, IL, United States	04/10/2021	04:40 PM	Arrived at Facility
Denver, CO, United States	04/09/2021	10:24 PM	Departed from Facility
Denver, CO, United States	04/09/2021	09:09 PM	Arrived at Facility
Commerce City, CO, United States	04/09/2021	08:35 PM	Departed from Facility
Commerce City, CO, United States	04/09/2021	05:32 PM	Origin Scan
Commerce City, CO, United States	04/09/2021	03:52 PM	Pickup Scan
United States	04/09/2021	02:56 PM	Shipper created a label, UPS has not received the package yet.
Tracking results provided by UPS 04/12/2021 6:08 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.

Download the UPS mobile app

Case Narrative

Client Name:	FDA Office of Cosmetics & Colors	**Contact:**	John Gasper
Contract Number:	75F40122P000335	**Phone:**	(240) 402-1133
Job Name/Location:	Assignment DFPG# 23-19 Batch No. 04032023 (Batch #1)	**Email:**	john.gasper@fda.hhs.gov
AMA COC Number:	646090	**Date Received:**	April 13, 2023

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
646090-1A	04032023-1	Dark brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-1B	04032023-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-1C	04032023-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-2A	04032023-2	Black/brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-2B	04032023-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-2C	04032023-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-3A	04032023-3	Very dark brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-3B	04032023-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-3C	04032023-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-4A	04032023-4	Brown colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-4B	04032023-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-4C	04032023-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-5A	04032023-5	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-5B	04032023-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
646090-5C	04032023-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-6A	04032023-6	Raspberry colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-6B	04032023-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-6C	04032023-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-7A	04032023-7	Tan colored (with cool gray undertones), slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-7B	04032023-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-7C	04032023-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-8A	04032023-8	Nude colored, slightly clumpy powder with a slight pearlescent appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-8B	04032023-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-8C	04032023-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-9A	04032023-9	Dark chocolate colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-9B	04032023-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-9C	04032023-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-10A	04032023-10	Nude colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-10B	04032023-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-10C	04032023-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-11A	04032023-11	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-11B	04032023-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
646090-11C	04032023-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-12A	04032023-12	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-12B	04032023-12		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-12C	04032023-12		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-13A	04032023-13	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-13B	04032023-13		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-13C	04032023-13		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-14	04032023-14.1	Tan colored, opaque liquid	Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-15	04032023-14.2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
646090-16	04032023-14.3		Mod. PLM ELAP 198.6/TEM ELAP 198.4

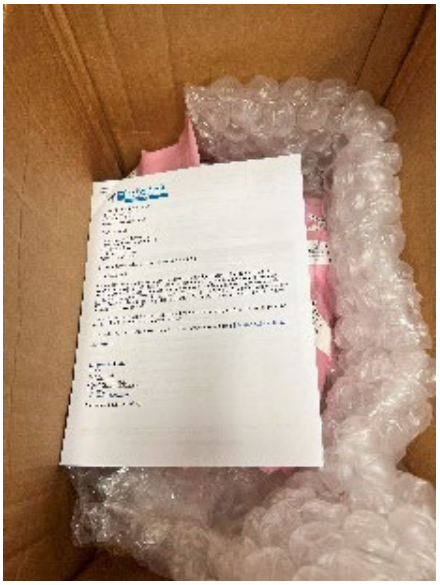
Summary of Samples Received 1

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

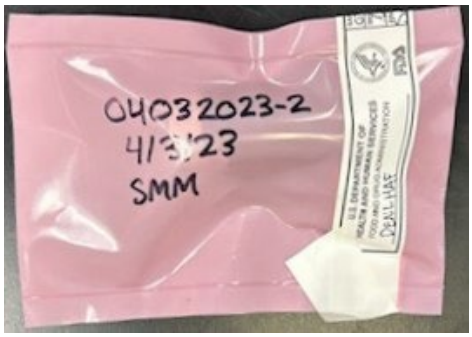
The samples were received at AMA Analytical Services, Inc. on April 13, 2023, at 09:35 via UPS Tracking No. (b) (6) by (b) (6), who assigned them to Chain of Custody (COC) No. 646090. This COC number served as the internal laboratory job number for tracking purposes. The set consisted of thirteen (13) powder samples submitted in ~1-oz glass jars, and one (1) liquid sample submitted in four (4) 50mL centrifuge tubes per sample. Each jar of powder was sealed with parafilm and individually packaged in a pink vacuum and custody sealed plastic bag. Each centrifuge tube was sealed with parafilm and each group of four (4) centrifuge tubes was packaged in a pink vacuum and custody sealed plastic bag. Conditions were checked upon receipt and all sample containers and custody seals were intact. The samples were entered into the AMA laboratory database on May 5, 2023, at 13:56 by (b) (6) and (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.

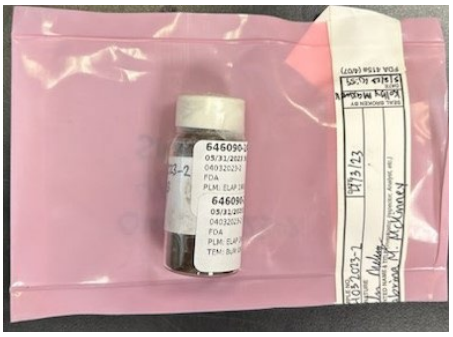
The following pictures document the condition of samples upon receipt at AMA:

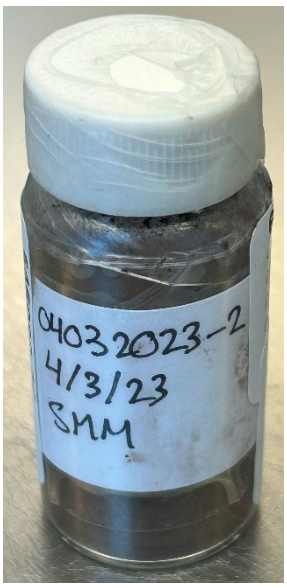



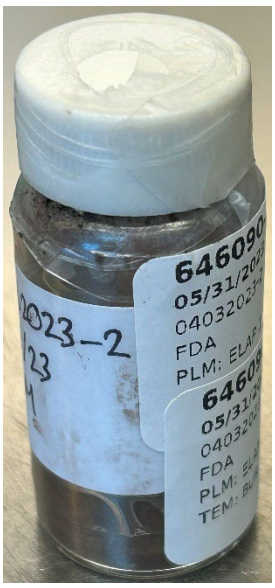

646090-1A, 1B, 1C/04032023-1

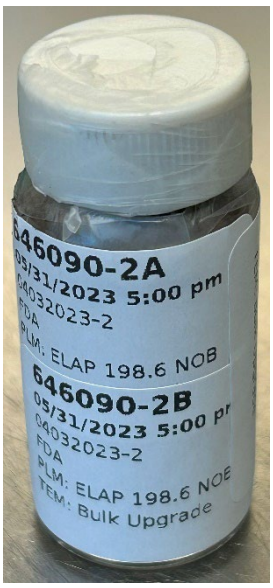
646090-2A, 2B, 2C/04032023-2

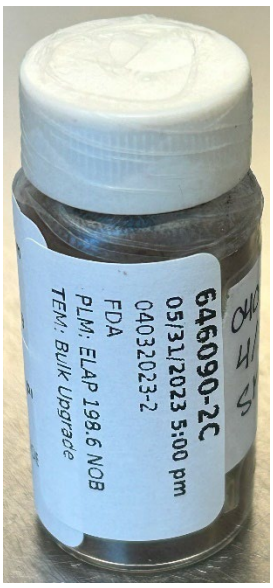


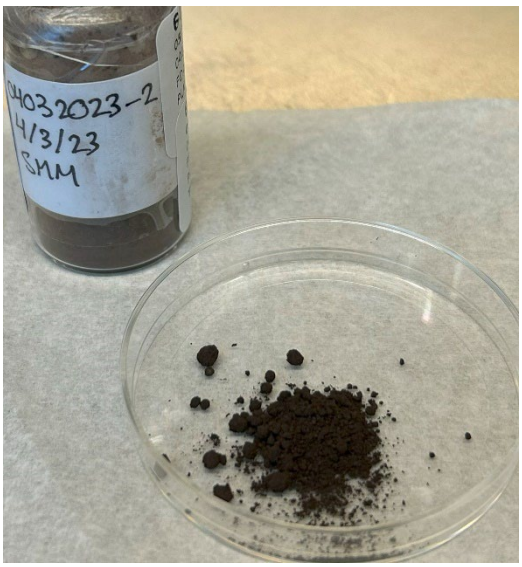






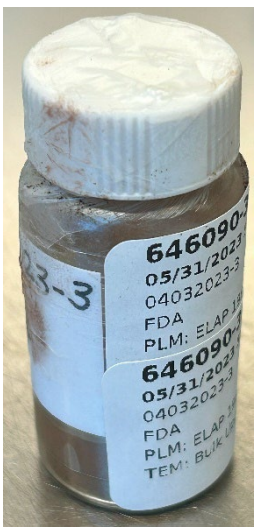


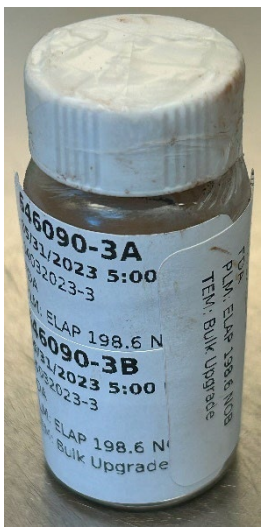




646090-3A, 3B, 3C/02212022-3

3





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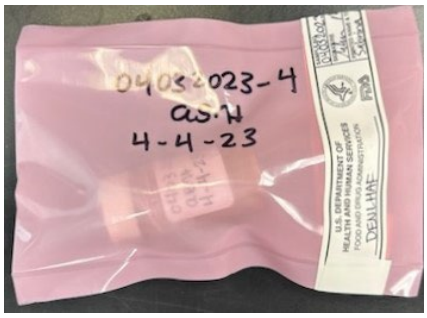
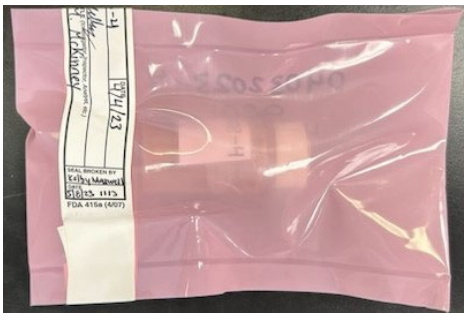
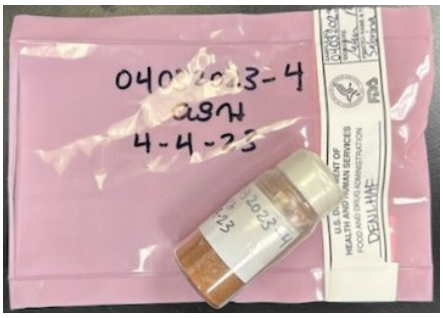
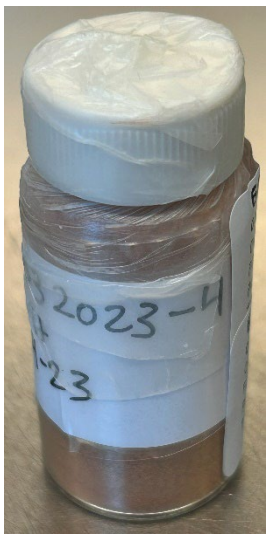
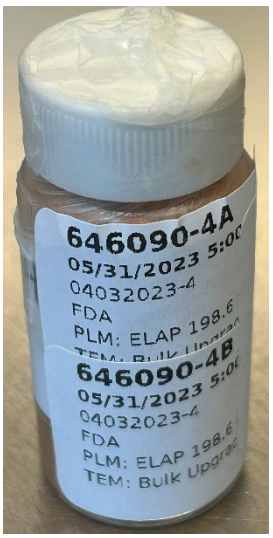
646090-4A, 4B, 4C/02212022-4

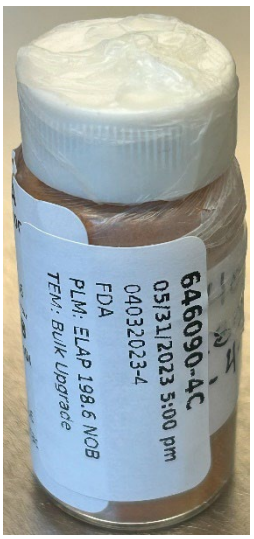


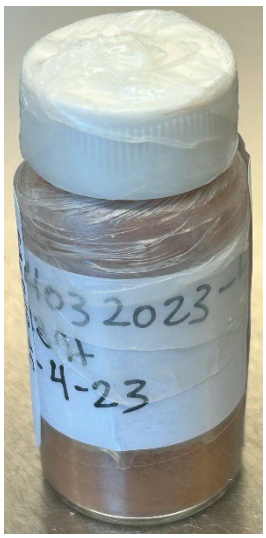












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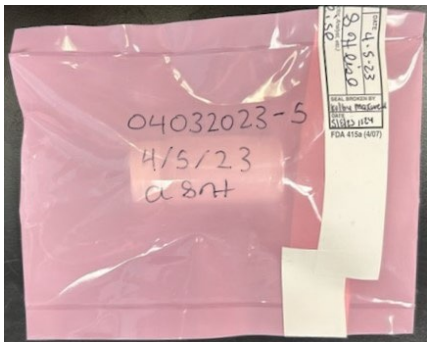
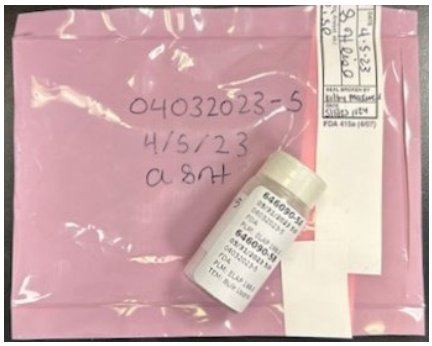
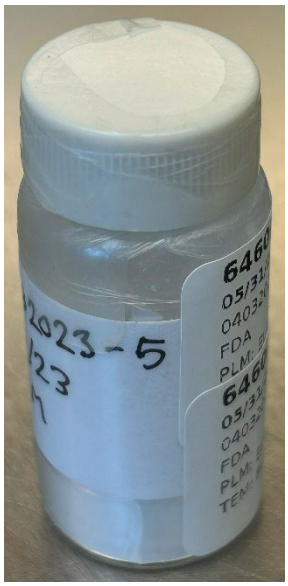
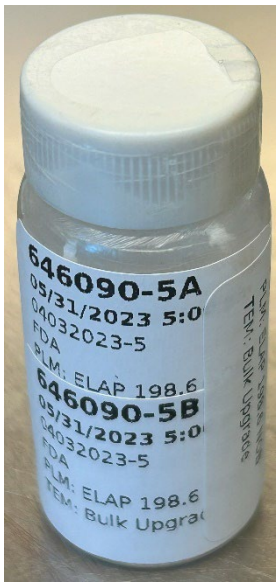
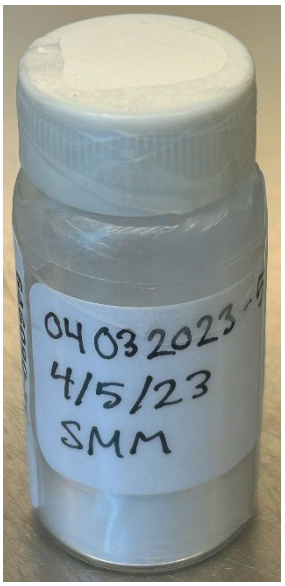
646090-5A, 5B, 5C/04032023-5

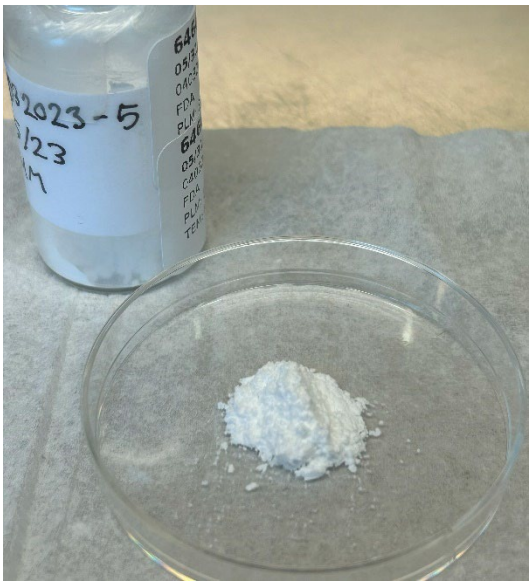




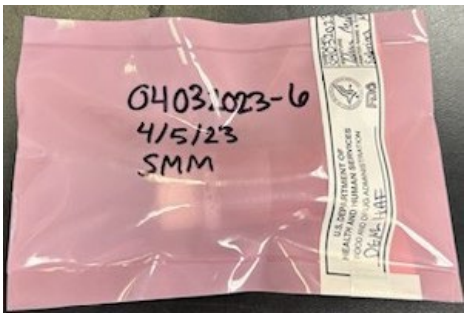


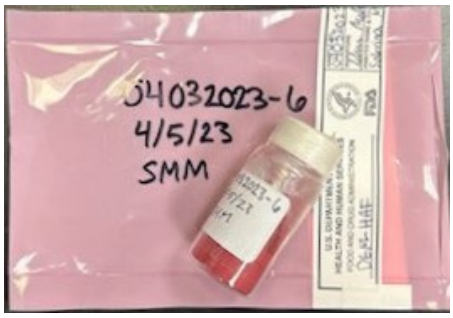


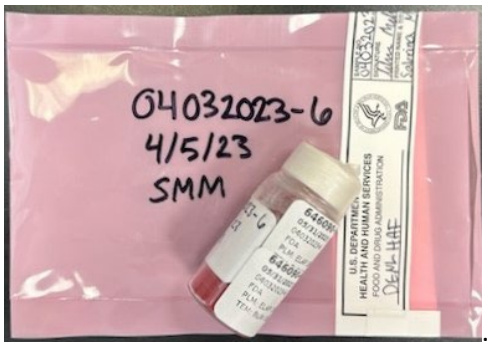


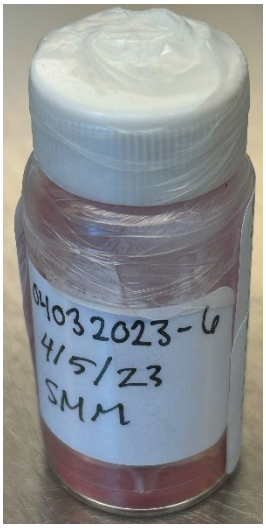


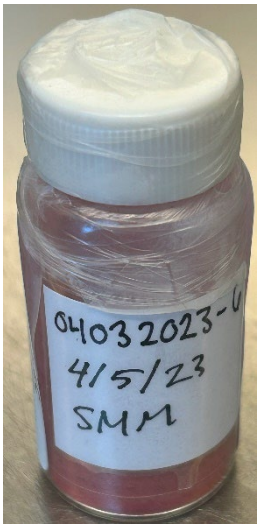
646090-6A, 6B, 6C/04032023-6

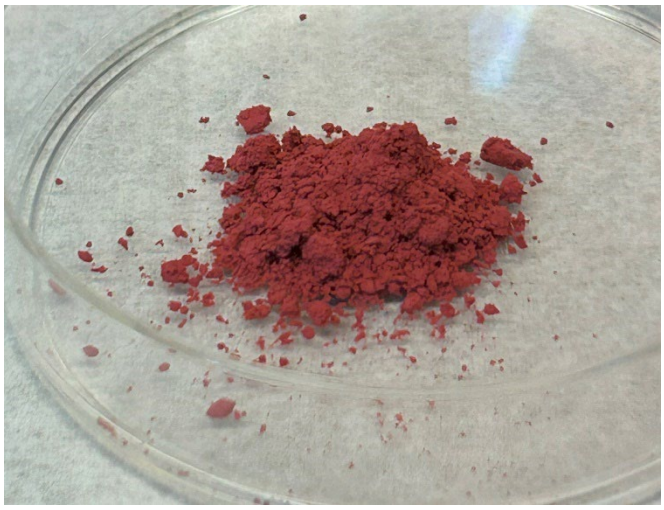












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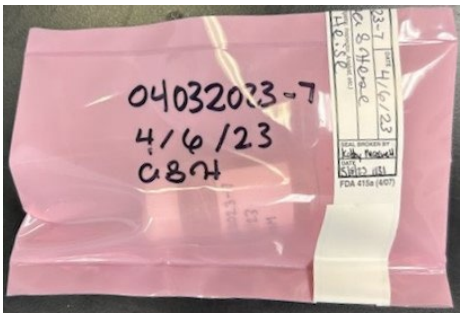
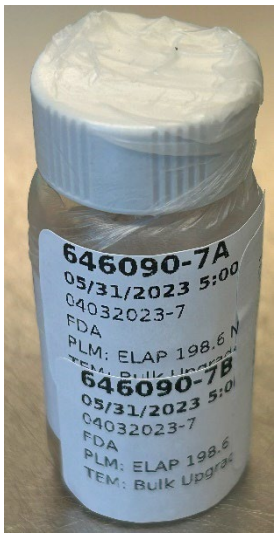
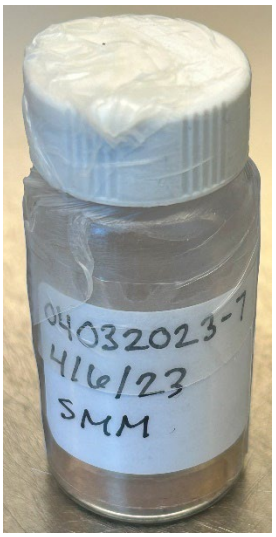
646090-7A, 7B, 7C/04032023-7







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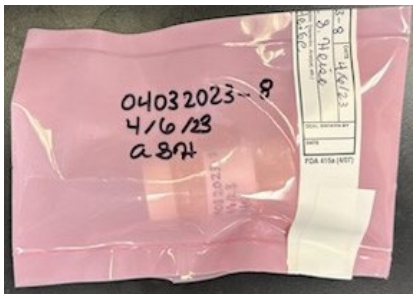
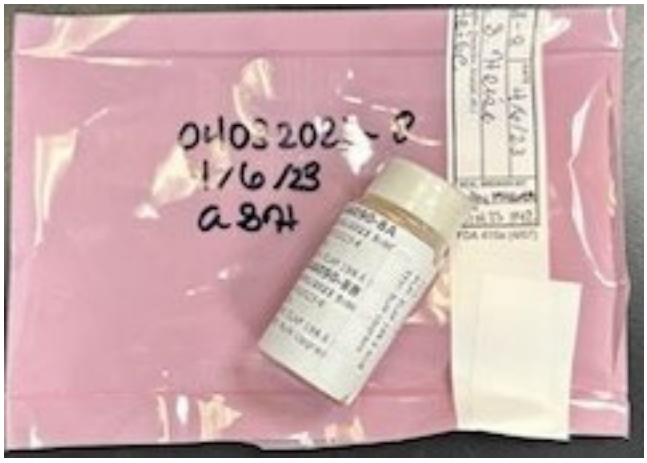
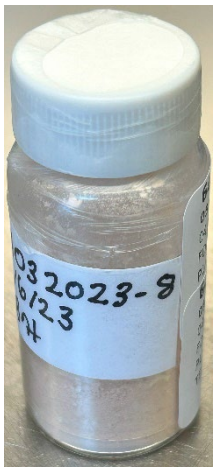
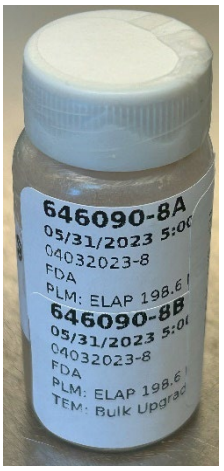
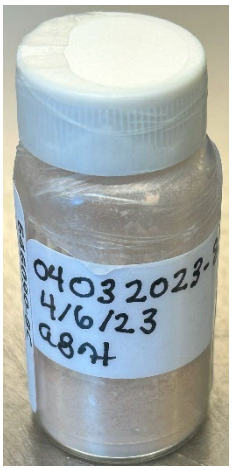
646090-8A, 8B, 8C/04032023-8

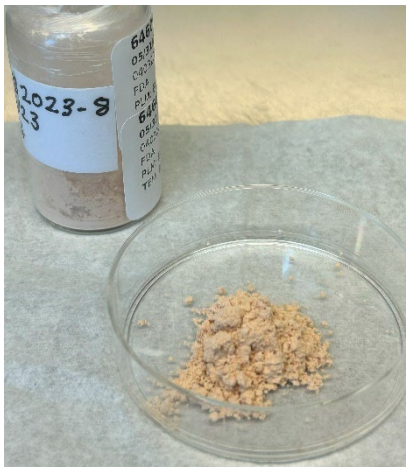












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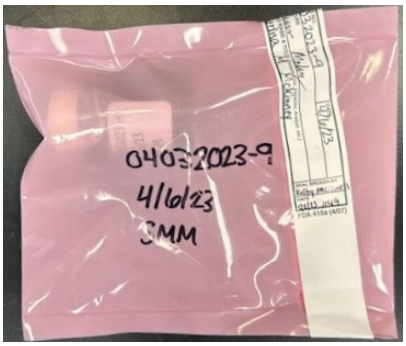
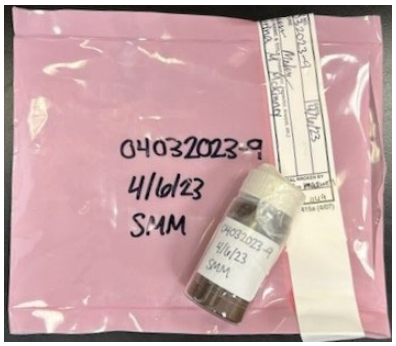
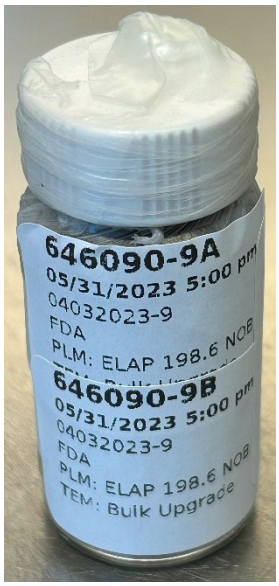
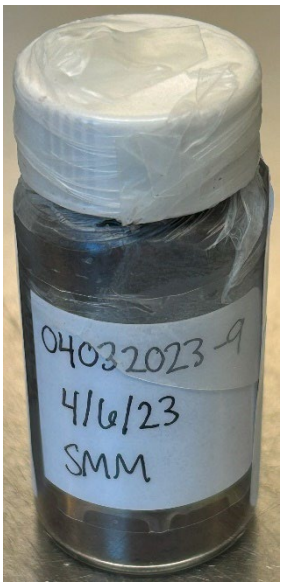
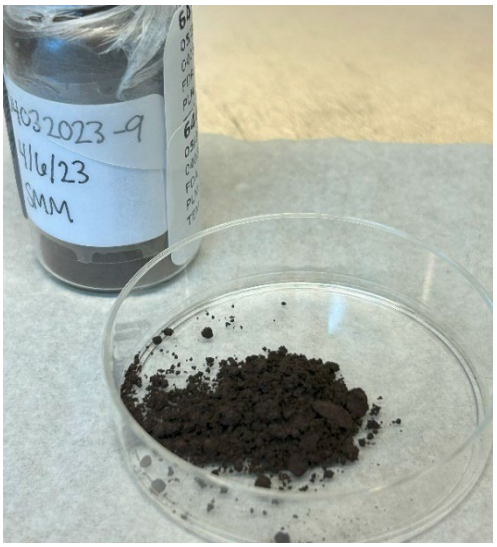
646090-9A, 9B, 9C/04032023-9

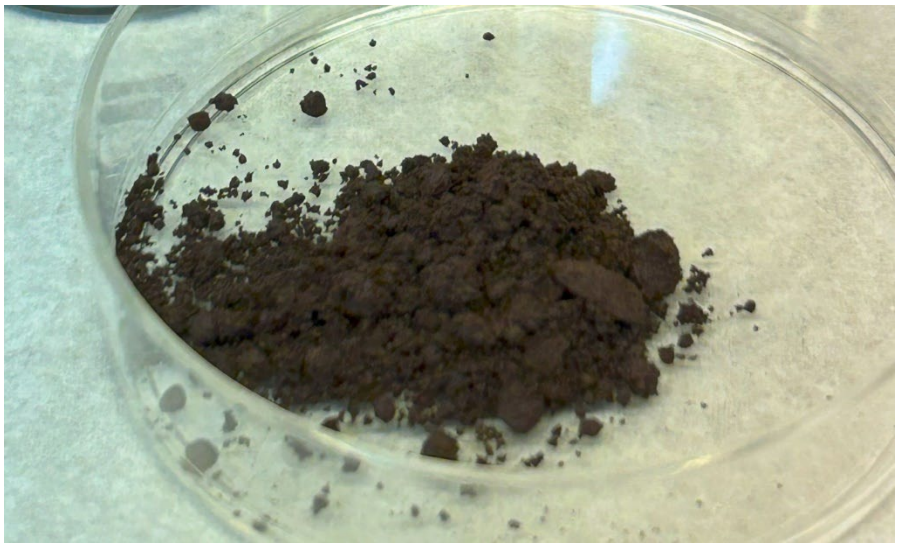












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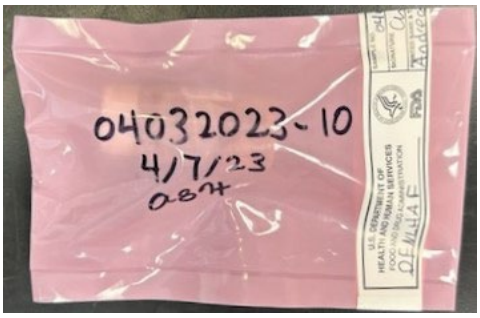

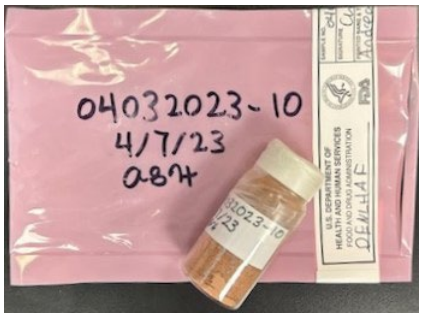

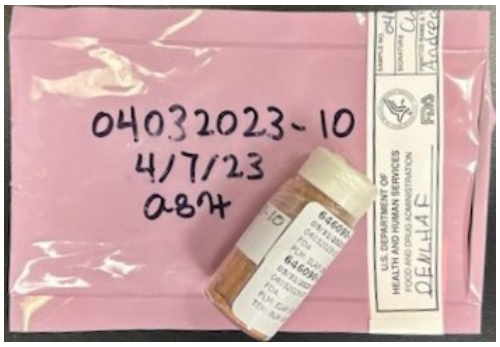

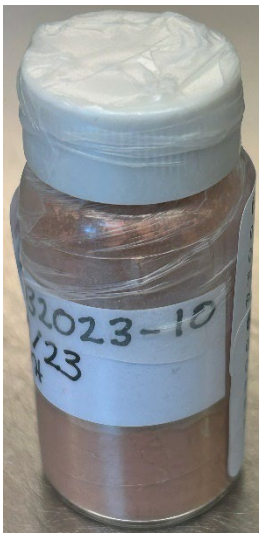

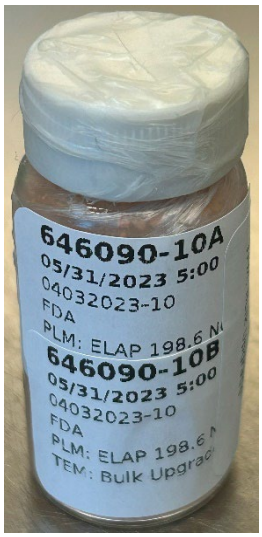

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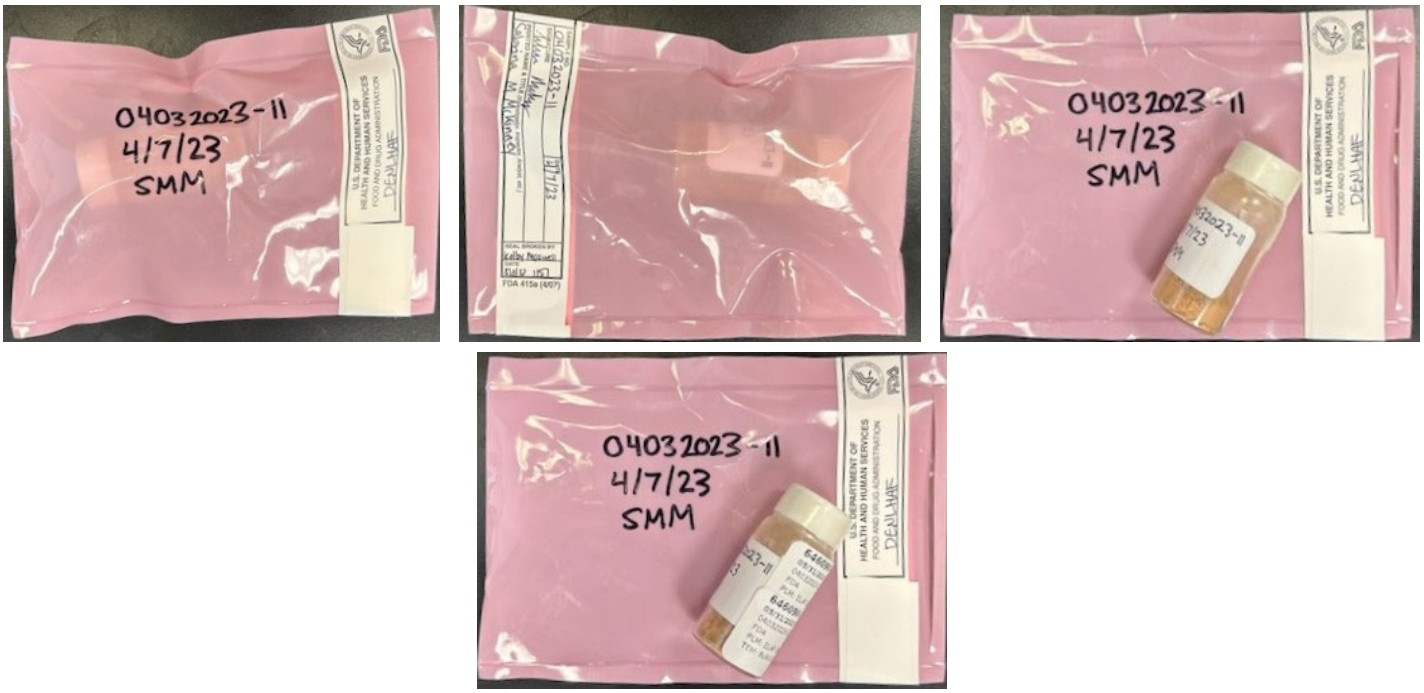
646090-11A, 11B, 11C/04032023-11



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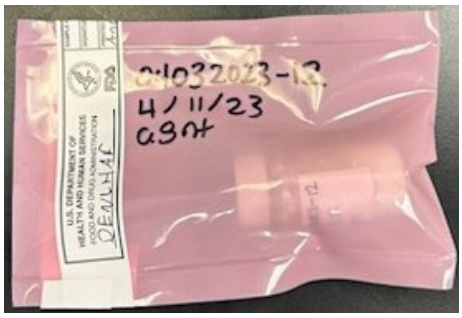
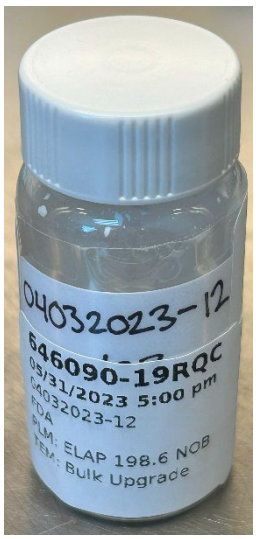
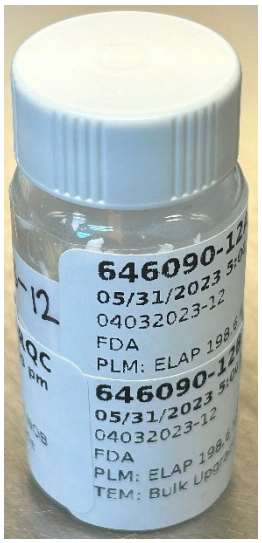
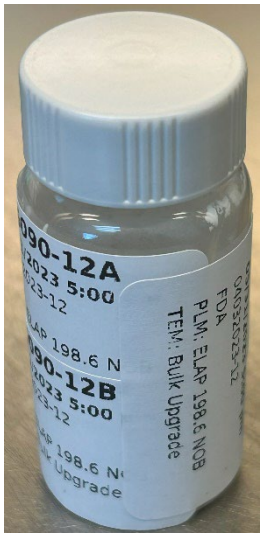
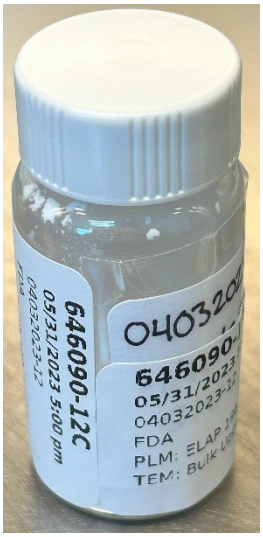
646090-12A, 12B, 12C/04032023-12

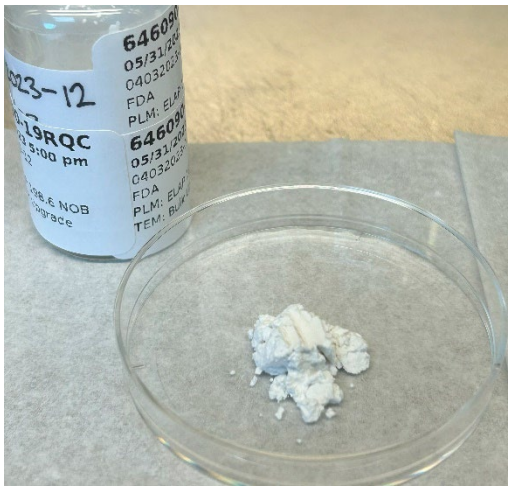












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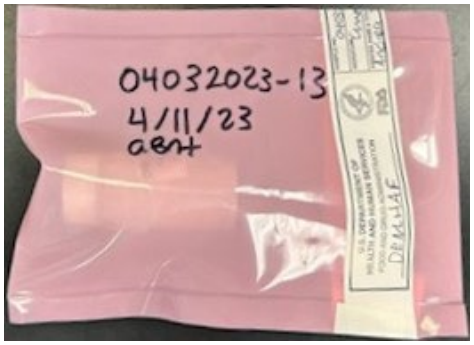
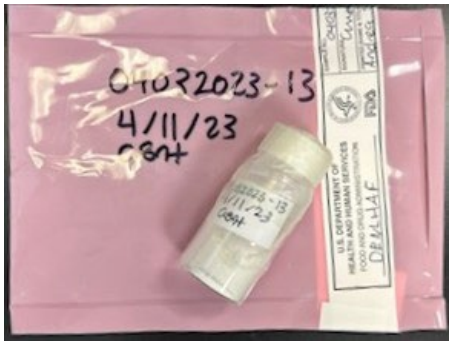
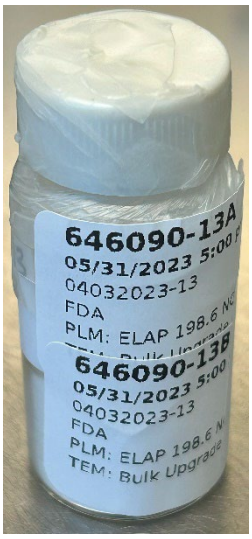
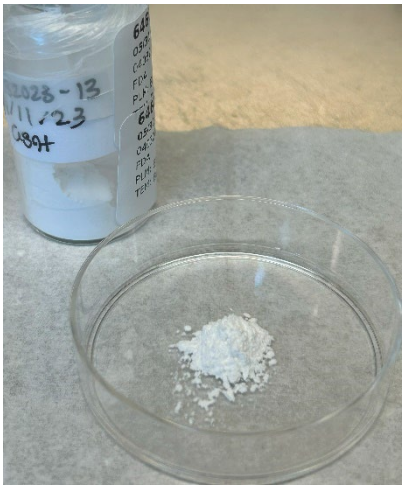
646090-13A, 13B, 13C/04032023-13









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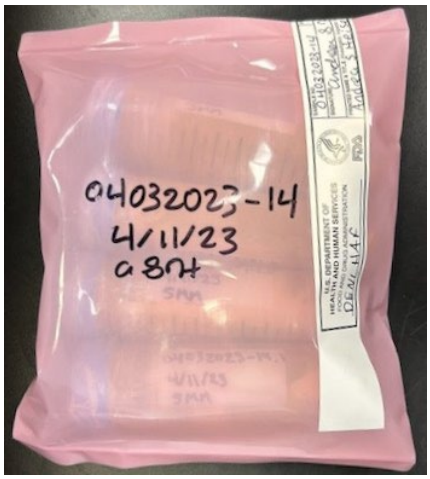
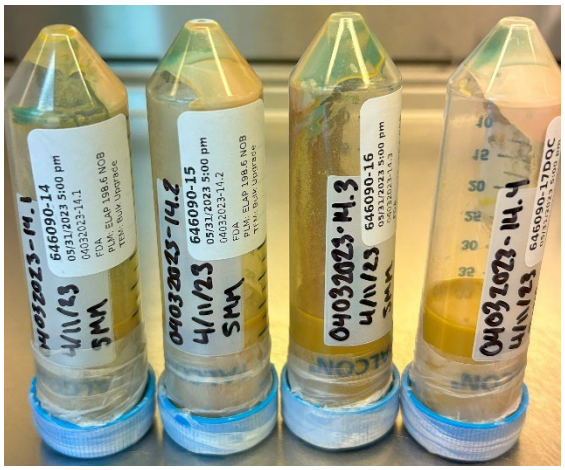
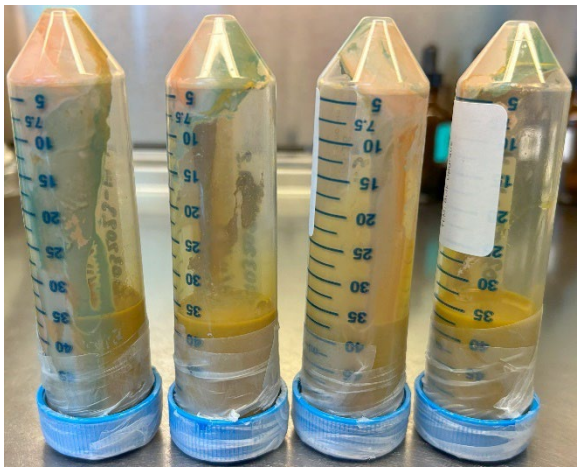
646090-14, 15, 16/04032023-14.1, 14.2, 14.3







Sample Preparation

Samples were gravimetrically reduced and filtered by (b) (6) on: May 10, 2023, through May 12, 2023, for 646090-1A through 646090-2C, 646090-18RQC, and NB23-285/286; May 19, 2023, through May 30, 2023, for 646090-3A through 646090-4C, and NB23-311/312; May 31, 2023, through June 2, 2023, for 646090-4C (TEM Re-Prep), 646090-5A through 646090-6C, and NB23-332/333; June 2, 2023, through June 8, 2023, for the 646090-7A through 646090-9C, and NB23-336/337; June 7, 2023, through June 13, 2023, for 646090-10A through 646090-12C, 646090-19RQC and NB23-341/342; June 15, 2023, through June 20, 2023, for 646090-13A through 646090-13C and NB23-353/354; and June 14, 2023, through June 20, 2023, for 646090-14 through 646090-16, 646090-17DQC and NB23-353/354.

PLM slide preparations were made by (b) (6) : May 12, 2023, for 646090-1A through 646090-2C, 646090-18RQC and NB23-286; May 16, 2023, for 646090-3A through 646090-4C and NB23-312; June1, 2023, for 646090-5A through 646090-6C and NB23-333; June 7, 2023, for 646090-7A through 646090-9C and NB23-337; June 9, 2023, for 646090-10A through 646090-12C, 646090-19RQC, and NB23-342; June 16, 2023, for 646090-13A through 646090-13C, and June 16, 2023, for 646090-14 through 646090-16 and NB23-354.

TEM Grid preparations were made by: (b) (6) on May 17, 2023, for 646090-1A through 646090-2C, NB23-285, 646090-18RQC, and 646090-DI1 through 646090-DI2; Ashley Rose on May 31, 2023, for 646090-3A through 646090-4B, NB23-311, and 646090-DI3 through 646090-DI4; Ashley Rose on June 2, 2023, for 646090-4C, 646090-DI4C, NB23-333, 646090-5A through 646090-6C, NB23-332, and 646090-DI5 through 646090-DI6; (b) (6) on June 8, 2023, for 646090-7A through 646090-9C, NB23-336, 646090-DI7 through 646090-DI9; (b) (6) on June 14, 2023, for 646090-10A through 646090-12C, 646090-19RQC, NB23-341, and 646090-DI10 through 646090-DI12; and (b) (6) on June 20, 2023 for 646090-13A through 646090-16, 646090-17DQC, NB23-353, and 646090-DI14 through 646090-DI17.

Sample preparation for powder materials 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.

Sample preparation for liquid materials consisted of the following steps:

1) Add an aliquot of liquid to a pre-weighed crucible.
2) Record wet weight.
3) Place crucible into drying for 12-20 hours.
4) Record dry weight.

5) Follow steps 3 through 13 above.

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

Problems Encountered During Preparation & Resolutions:

On 5/25/2023, some of the post acid treatment residue was spilled for aliquot 646090-4C prior to being weighed. As a result, this aliquot was completely reprepared on May 31, 2023, through June 2, 2023, along with the other series of samples that were put through the muffle furnace on these dates (aliquots 646090-5A through 646090-6C). The matrix blank for this gravimetric reduction date range, NB23-332, was associated with the re-preparation for aliquot 646090-4C. A new filtration blank, 646090-DI4C, was also prepared.

No other 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 *Discussion and Interpretation of Analytical Findings* 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 TEM equipped with ThermoFisher Pathfinder 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
For liquid samples, the value for W1 is the dry weight mass.

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.

Limits 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 aliquots of sample 04032023-8 contained very small amounts of tremolite that were below our four (4) fiber LOQ. For these samples, we defined our LOQ as follows:

646090-8A: mass of the single (1) observed tremolite particle plus the mass of three (3) tremolite fibers measuring 0.5 x 0.04 microns

646090-8C: mass of the two (2) observed tremolite particles plus the mass of two (2) tremolite fibers measuring 0.5 x 0.04 microns

Discussion and Interpretation of Analytical Findings

646090-1A, 1B, 1C/Client Sample: 04032023-1

PLM

All three aliquots of sample 04032023-1 were analyzed by (b) (6) on June 9, 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.

646090-1A	No Asbestos Detected
646090-1B	No Asbestos Detected
646090-1C	No Asbestos Detected

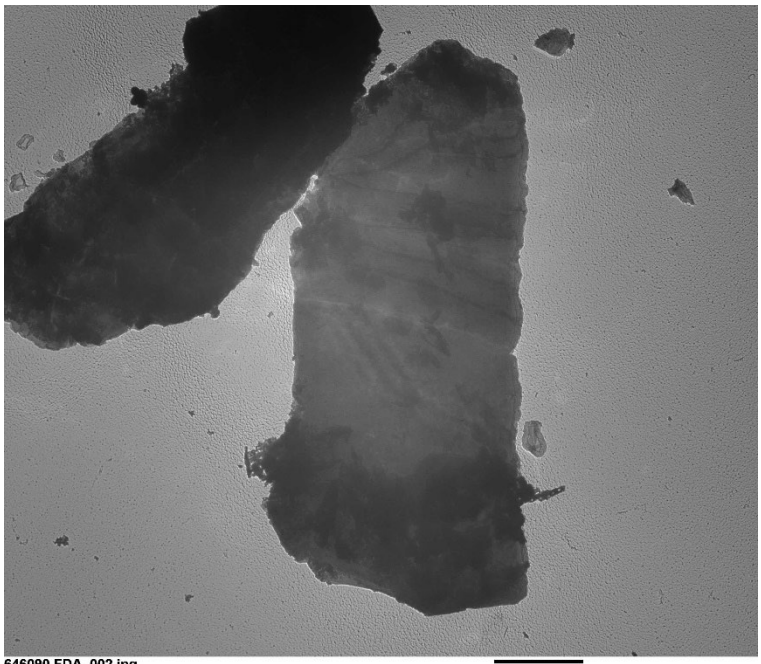
TEM

(b) (6) analyzed aliquot 1A on May 30, 2023, and aliquot 1C on May 31, 2023. (b) (6) analyzed aliquot 1b on May 30, 2023. The primary particle observed was mica; iron particles were also observed along with titanium particles, carbon particles, silicon particles, and very few talc 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.

646090-1A	No Asbestos Detected
646090-1B	No Asbestos Detected
646090-1C	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.

646090-1A, Mica Particle

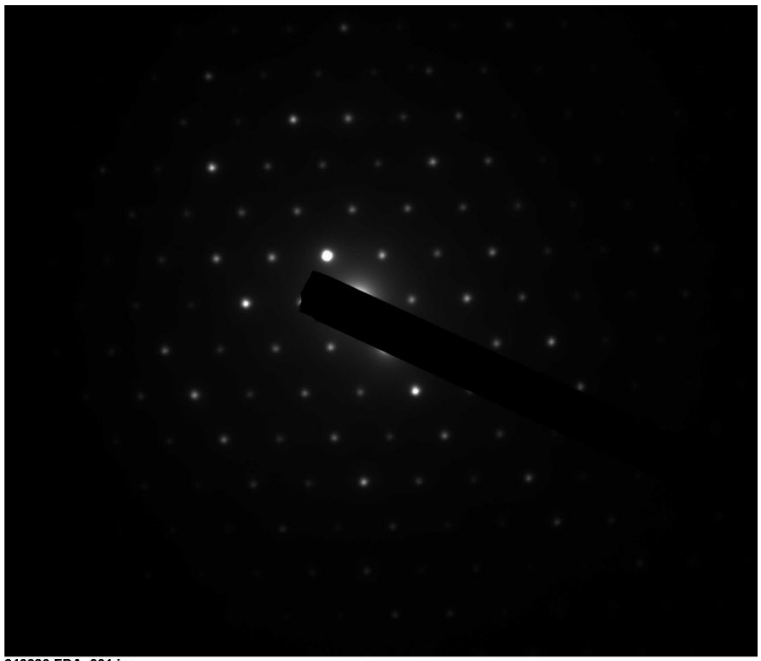


646090 FDA_002.jpg
646090-1A
Mica

Cal: 0.006365 µm/pix
09:27 2023-05-30
TEM Mode: Imaging
Microscopist: Andreas Saldivar
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: 1500 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above



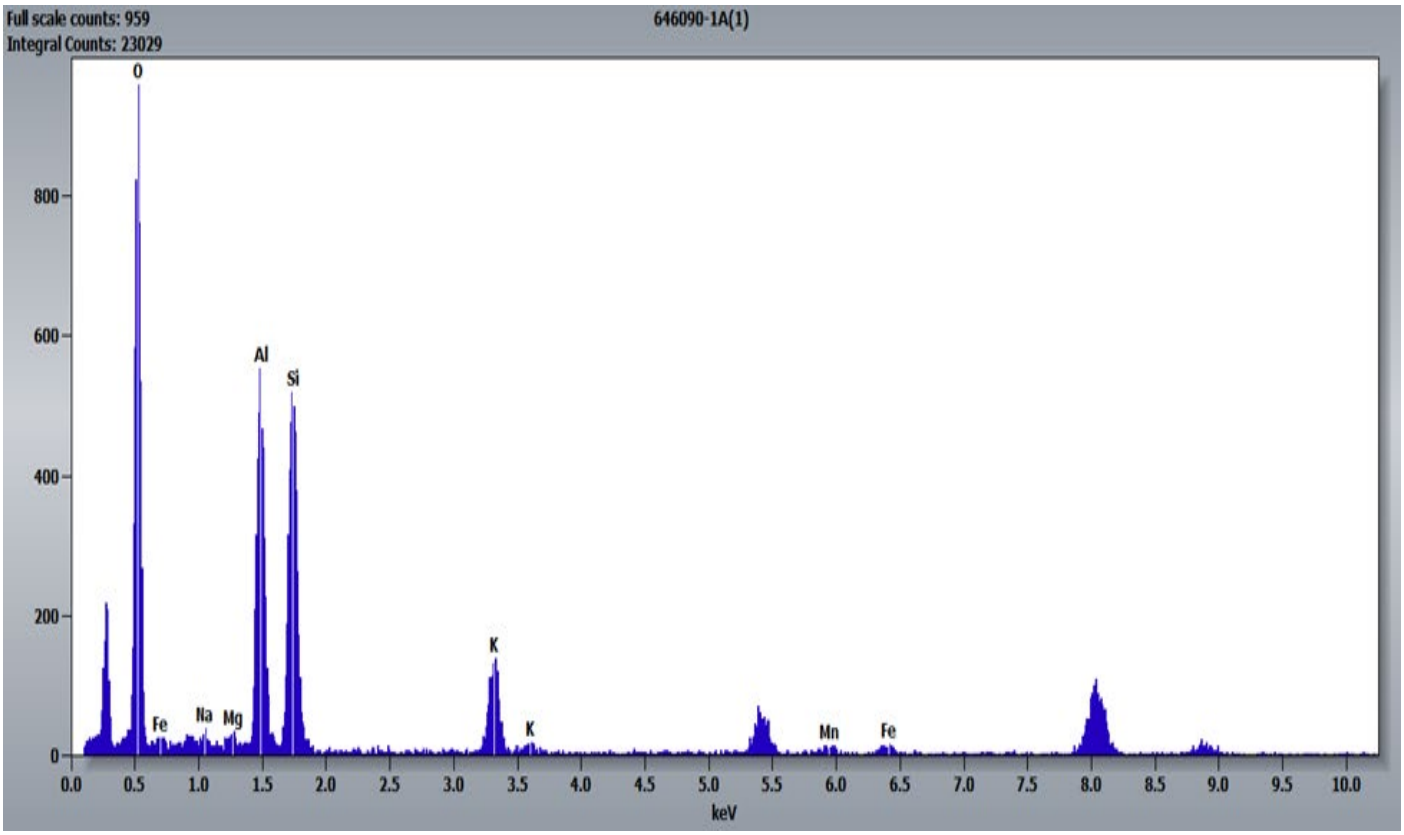
646090 FDA_001.jpg
646090-1A
Mica

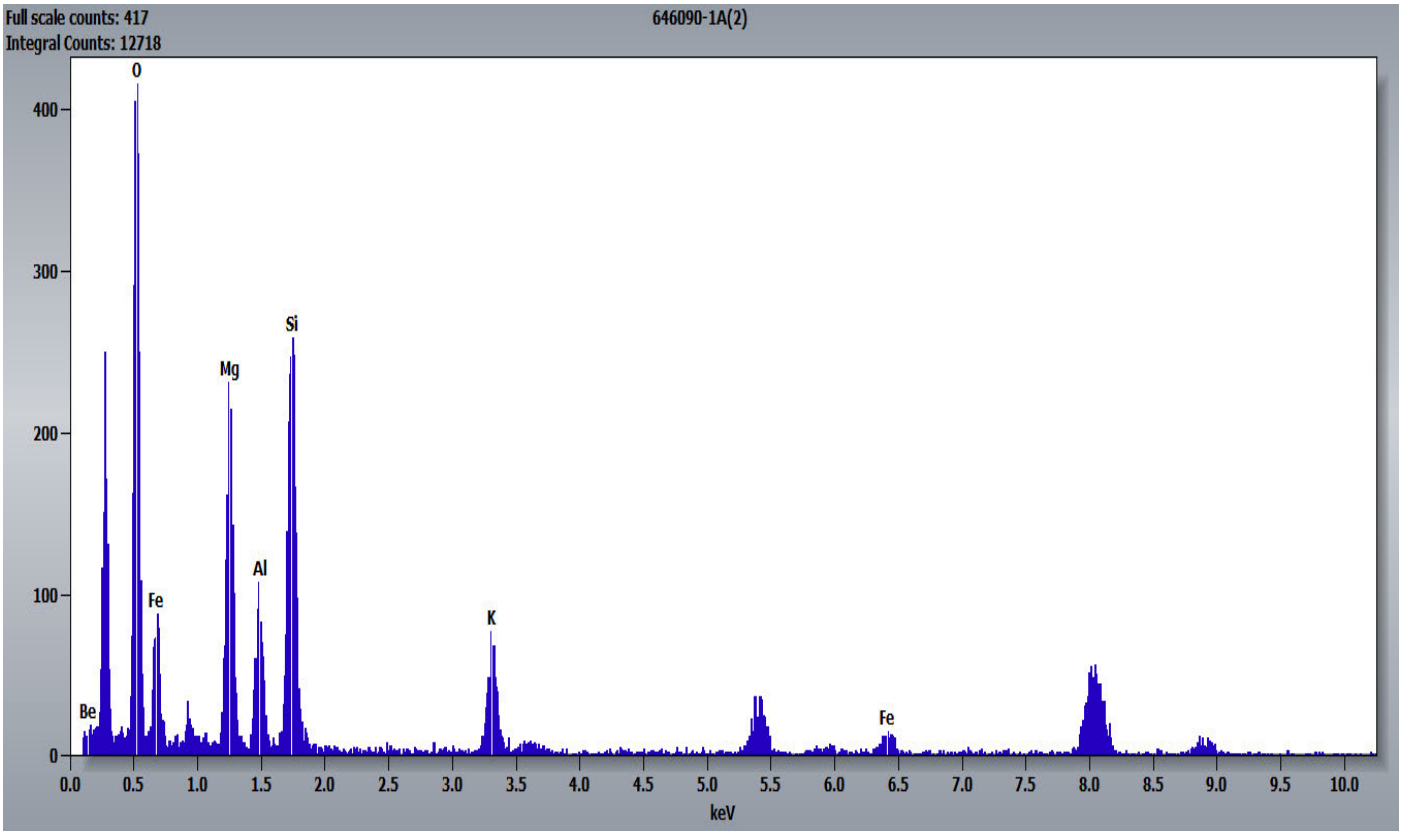
09:25 2023-05-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

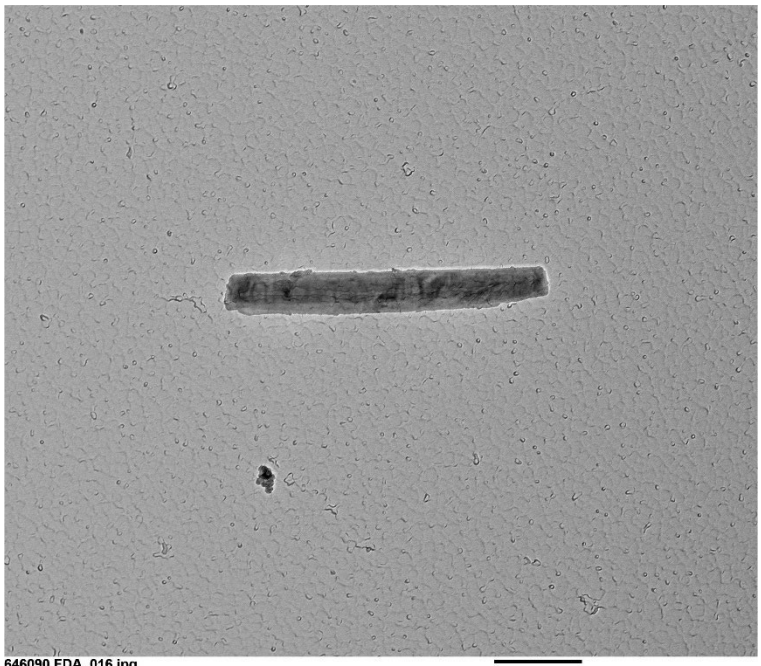
Diffraction Pattern from the Mica Particle Pictured Above

Chemistry from the Mica Particle Pictured Above





646090-1B, Elongated Mica Particle



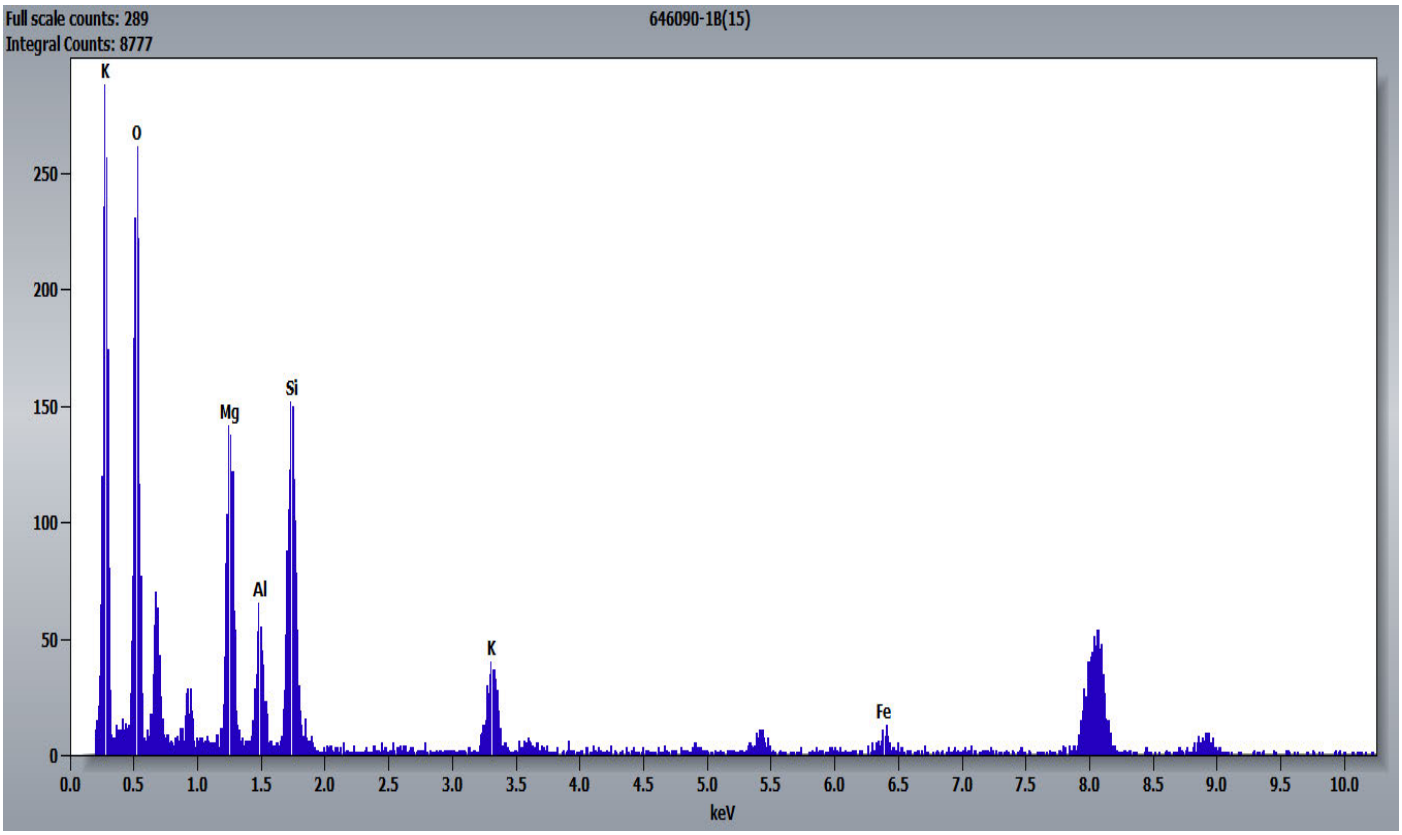
646090 FDA_016.jpg
646090-1B
Elongated Mica

Cal: 0.001612 µm/pix
16:39 2023-05-30
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

500 nm
HV=80kV
Direct Mag: 6000 x

Diffraction Pattern from the Elongated Mica Particle Pictured Above

Chemistry from the Elongated Mica Particle Pictured Above



646090-1C, Elongated Mica Particle

646090 FDA_020.jpg
646090-1C
Mica

Cal: 0.003183 µm/pix
10:55 2023-05-31
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: 3000 x

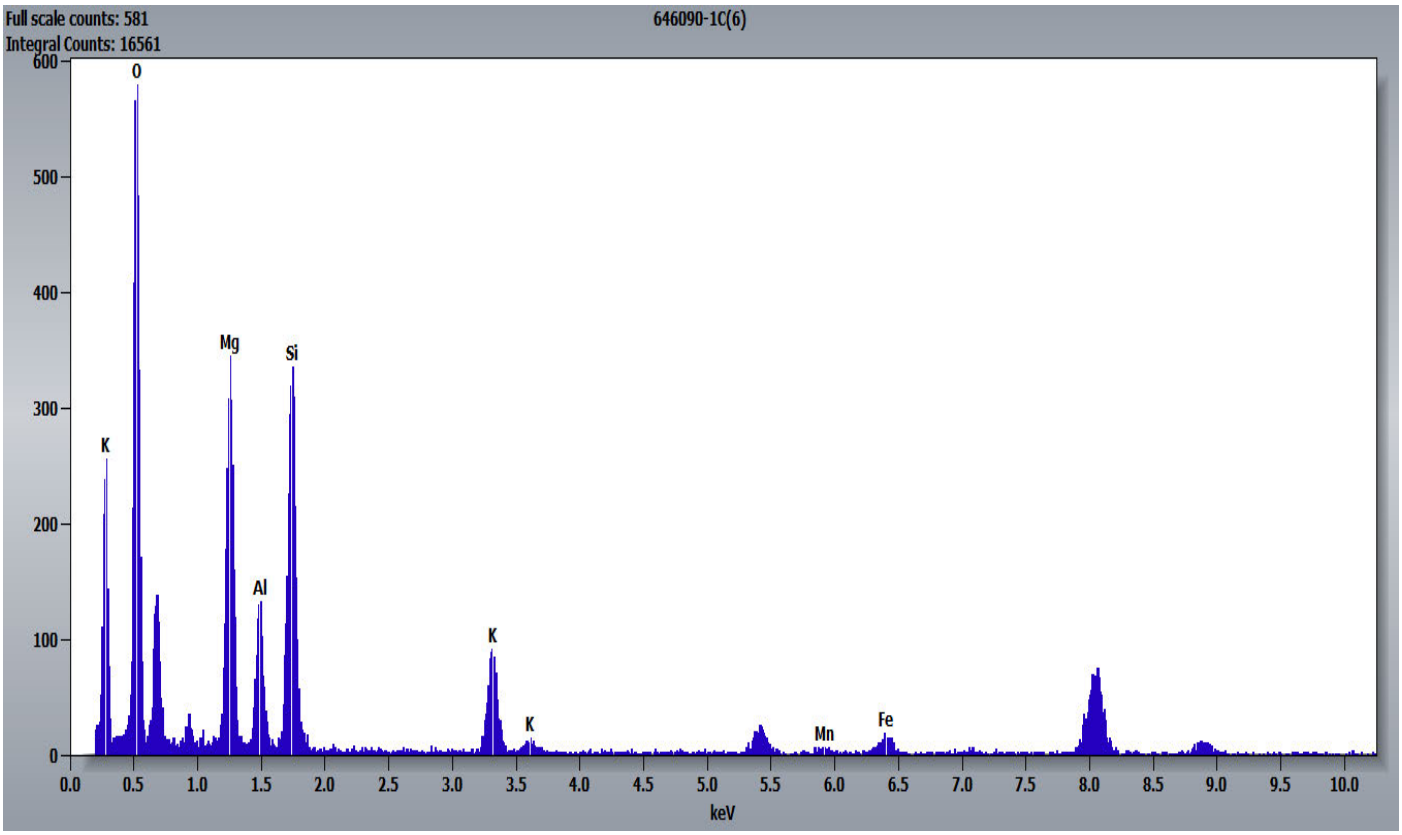
Diffraction Pattern from the Elongated Mica Particle Pictured Above

646090 FDA_019.jpg
646090-1C
Mica

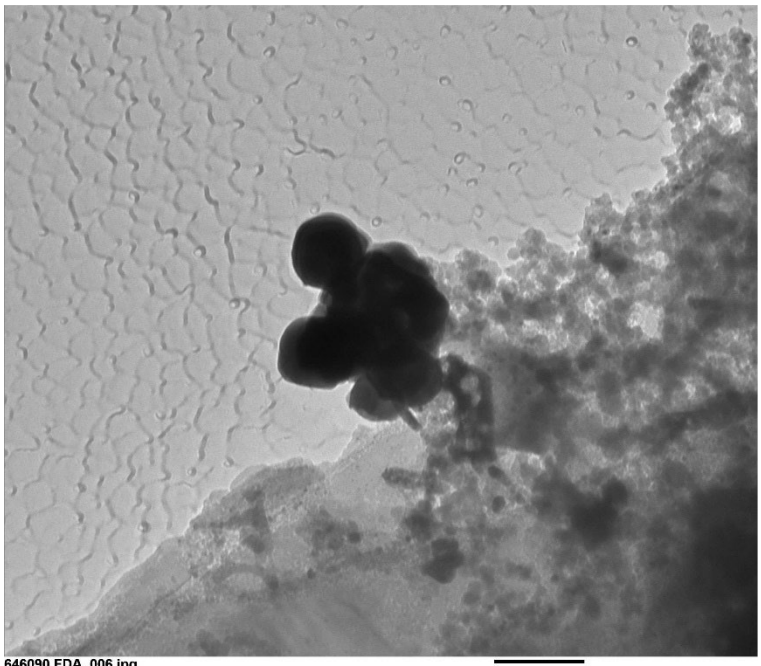
10:53 2023-05-31
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

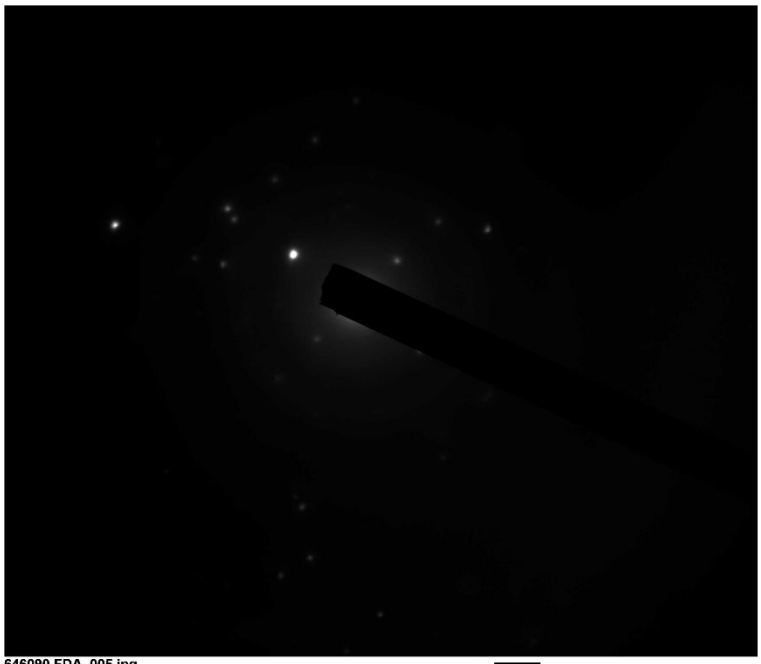
Chemistry from the Elongated Mica Particle Pictured Above



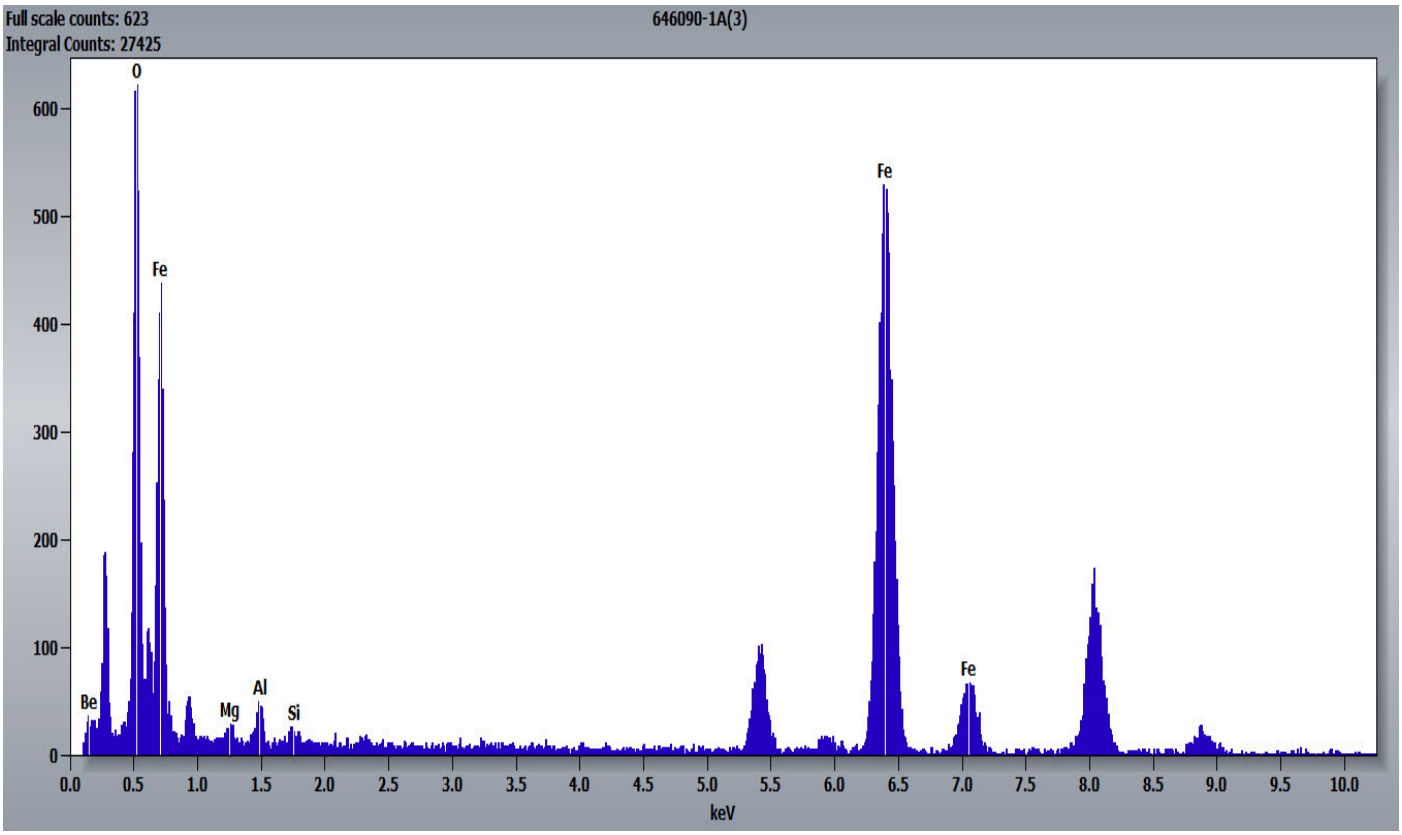
646090-1A, Iron Particle(s)



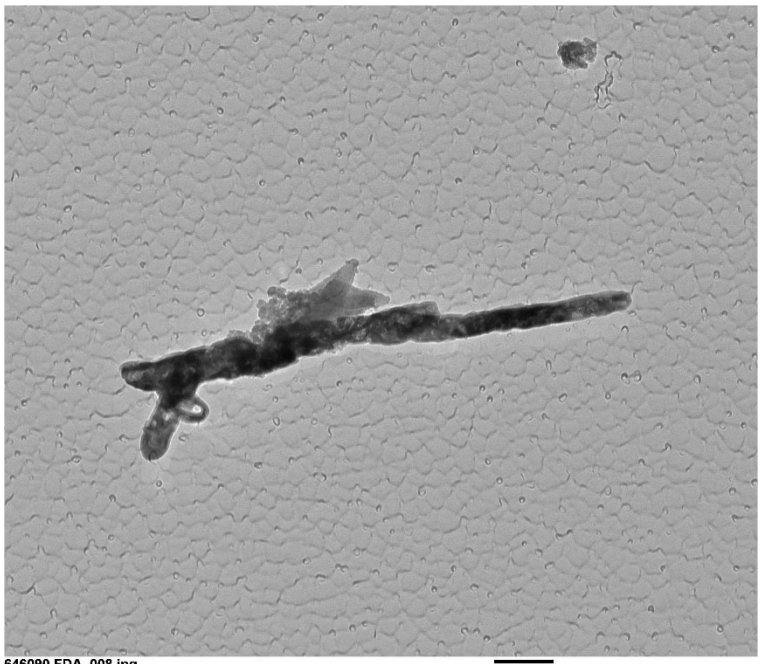
Diffraction Pattern from the Iron Particle(s) Pictured Above



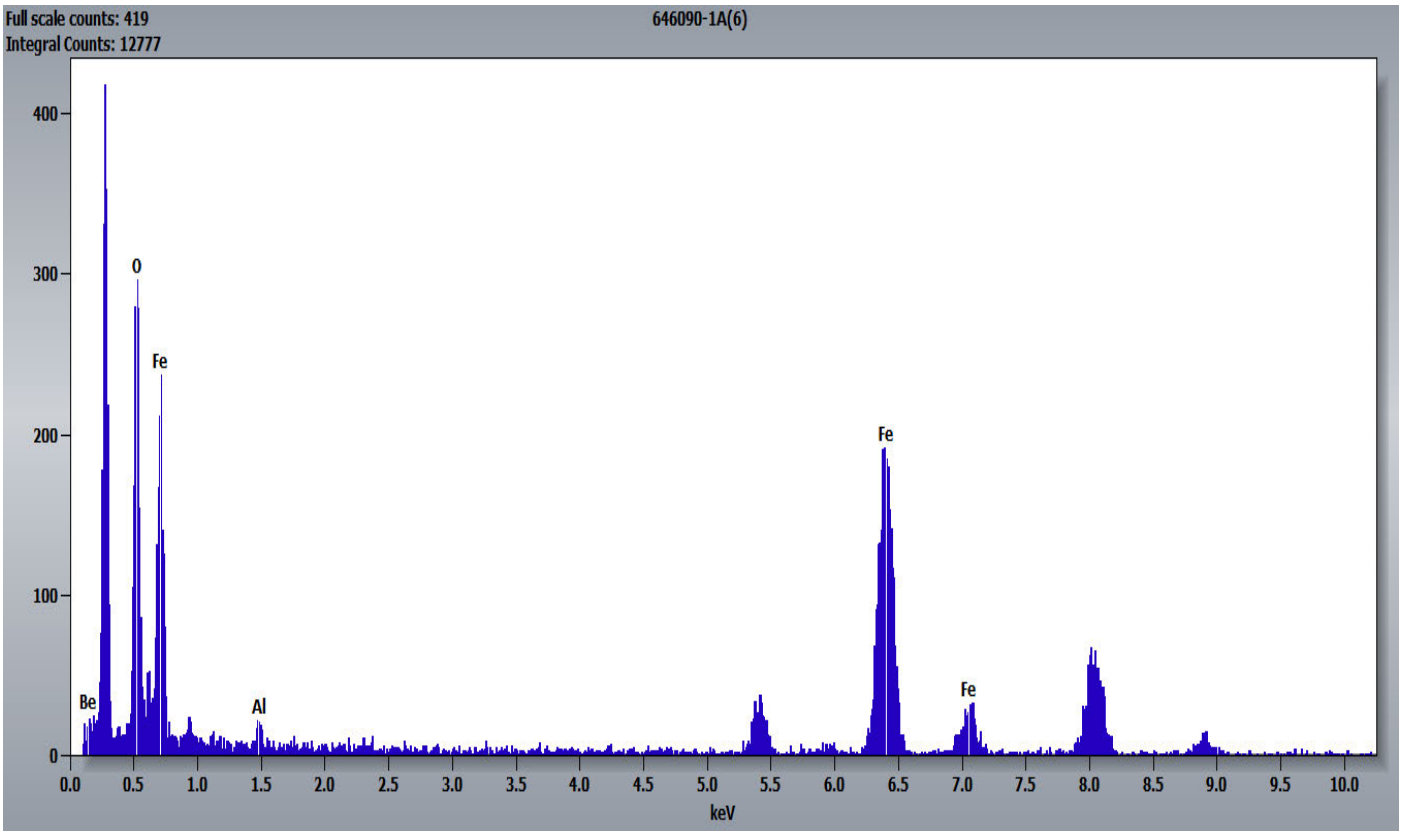
Chemistry from the Iron Particle Pictured Above



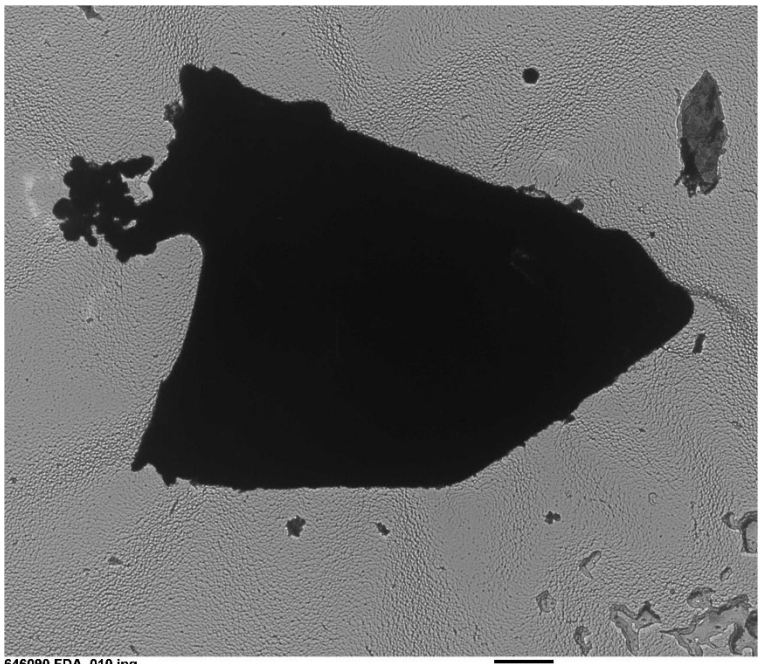
646090-1A, Elongated Iron Particle



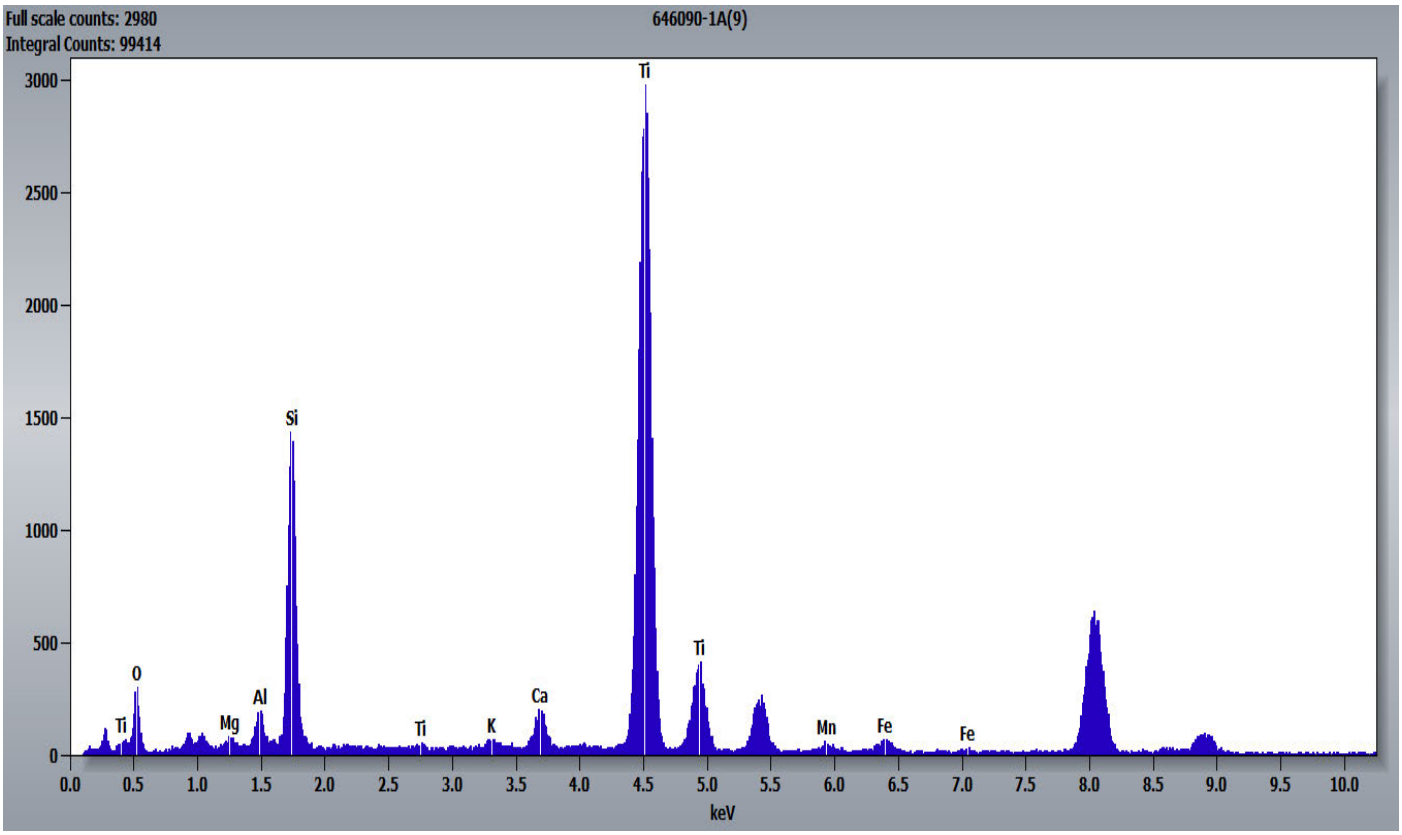
Chemistry from the Elongated Iron Particle Pictured Above



646090-1A, Titanium Particle



Chemistry from the Titanium Pictured Above



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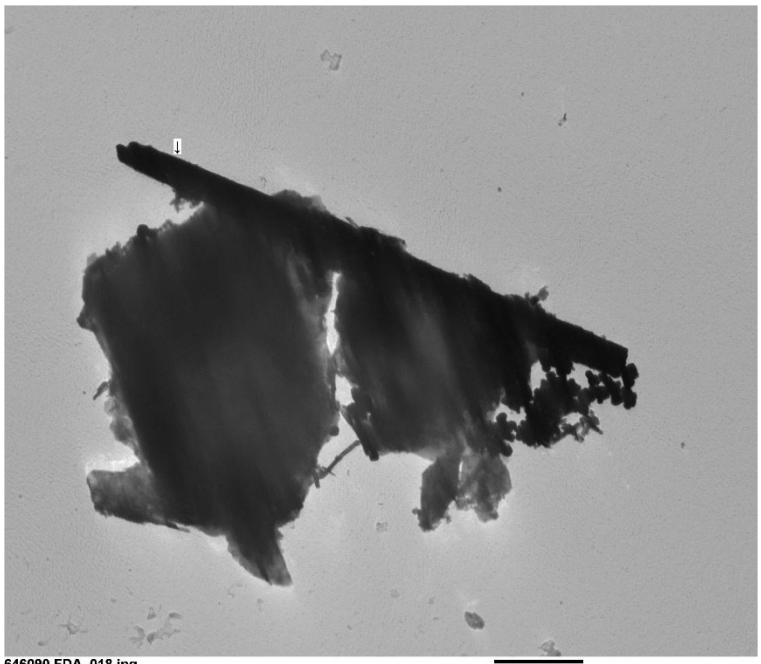
646090-1B, Elongated Titanium Particle

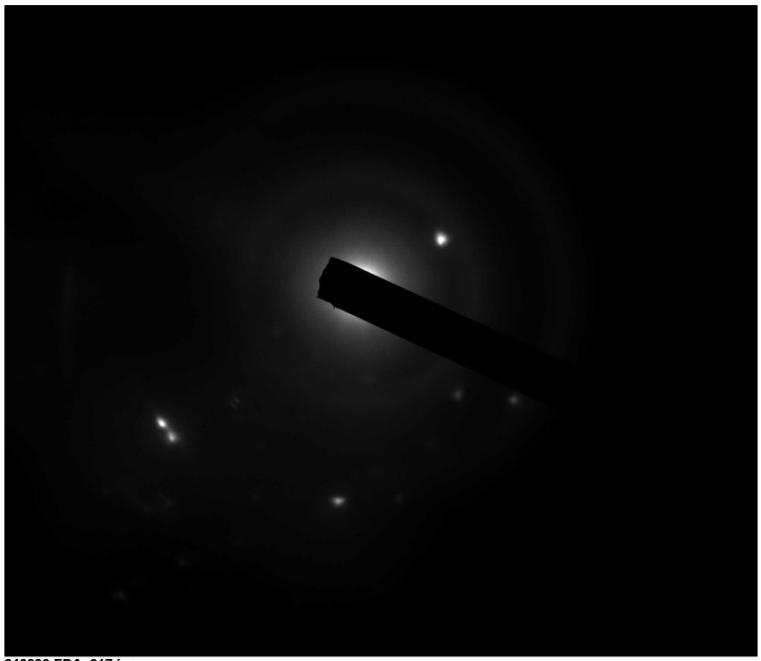


646090 FDA_018.jpg
646090-1B
Ti Fiber

Cal: 0.006365 µm/pix
16:49 2023-05-30
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

2 µm
HV=80kV
Direct Mag: 1500 x

Diffraction Pattern from the Elongated Titanium Particle Pictured Above

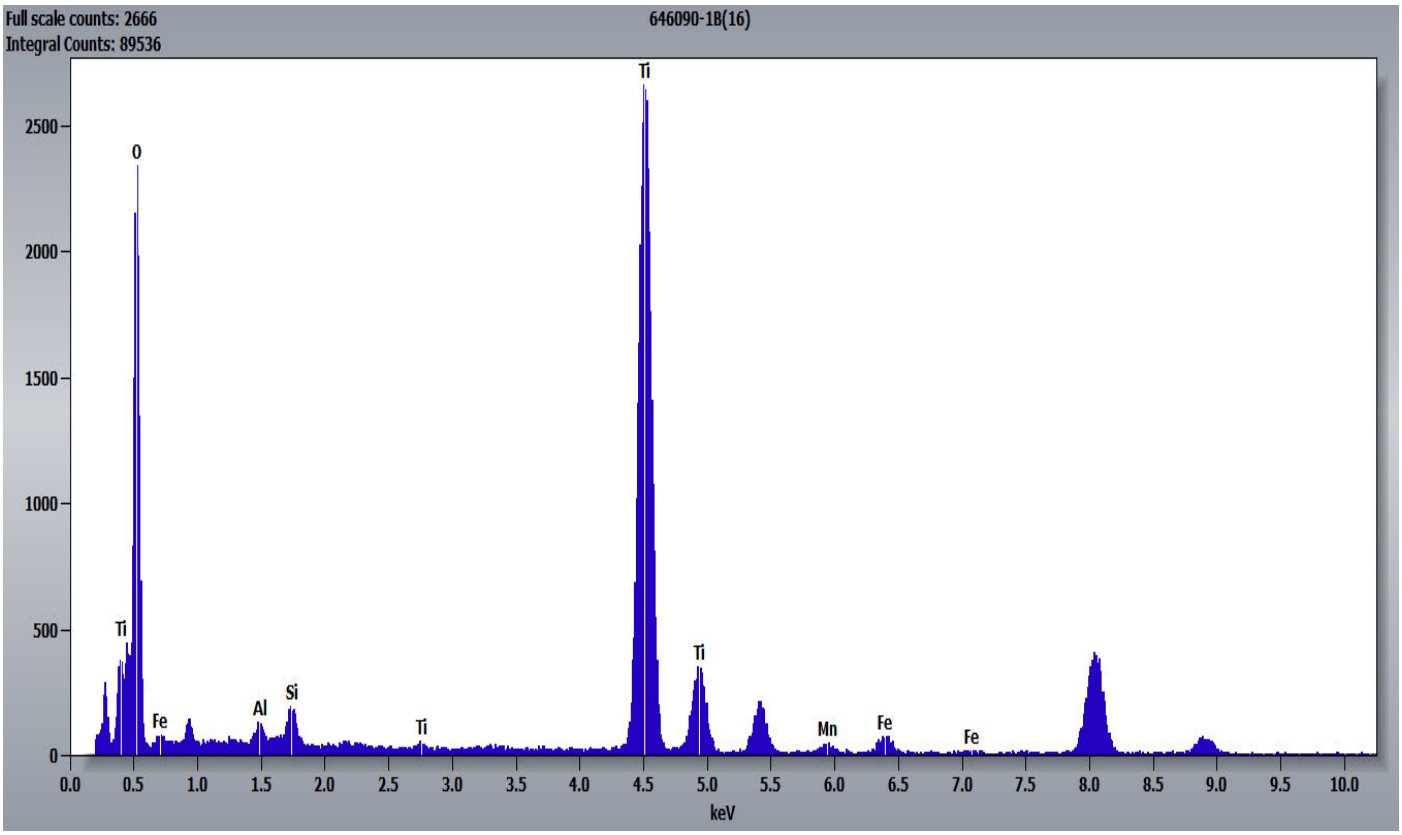


646090 FDA_017.jpg
646090-1B
Ti Fiber

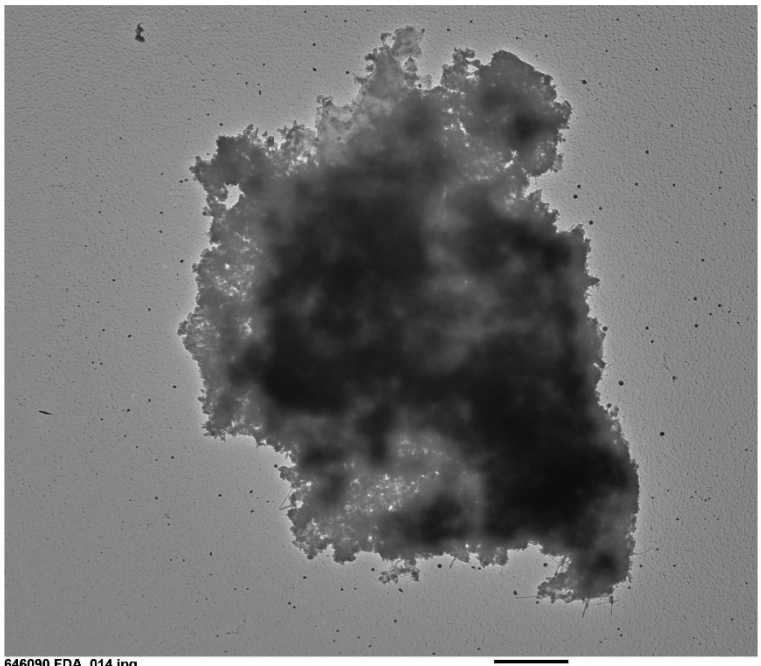
Cal: 0.001612 µm/pix
16:46 2023-05-30
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Elongated Titanium Particle Pictured Above

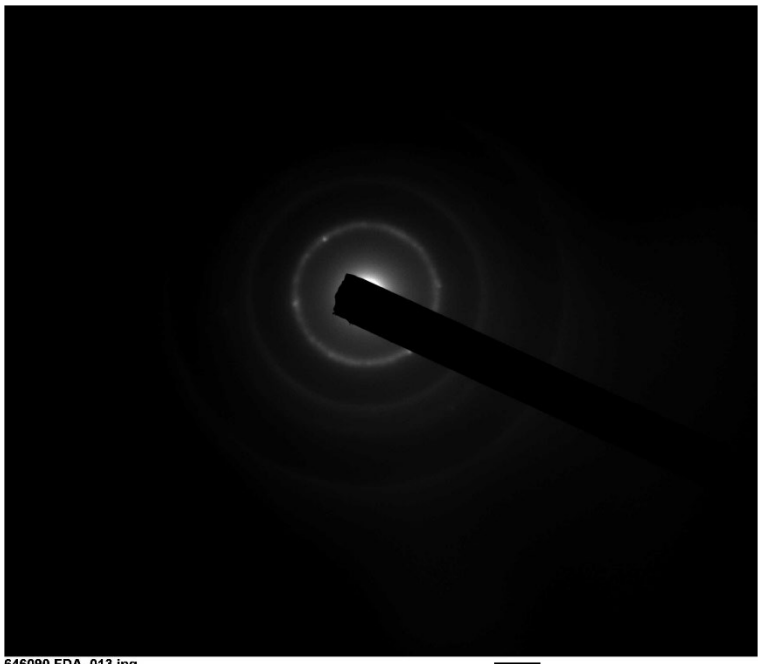


646090-1B, Carbon Particles

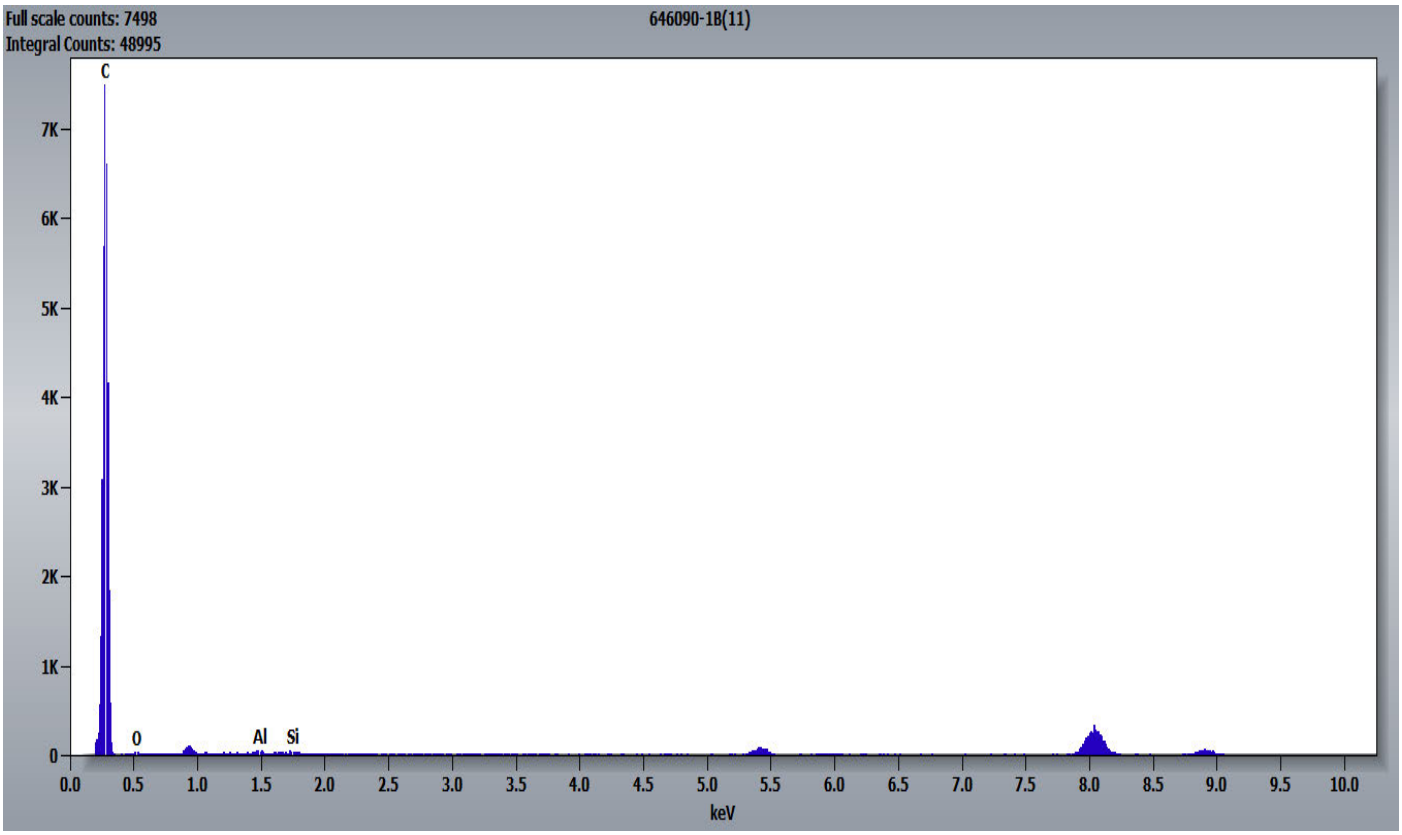


Asbestos · Lead · Mold · Nano

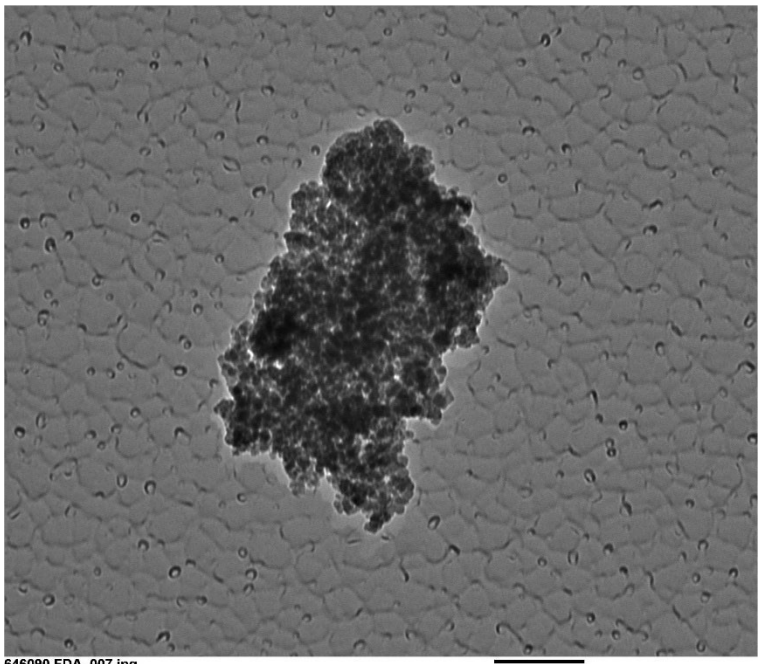
Diffraction Pattern from the Carbon Particle Pictured Above



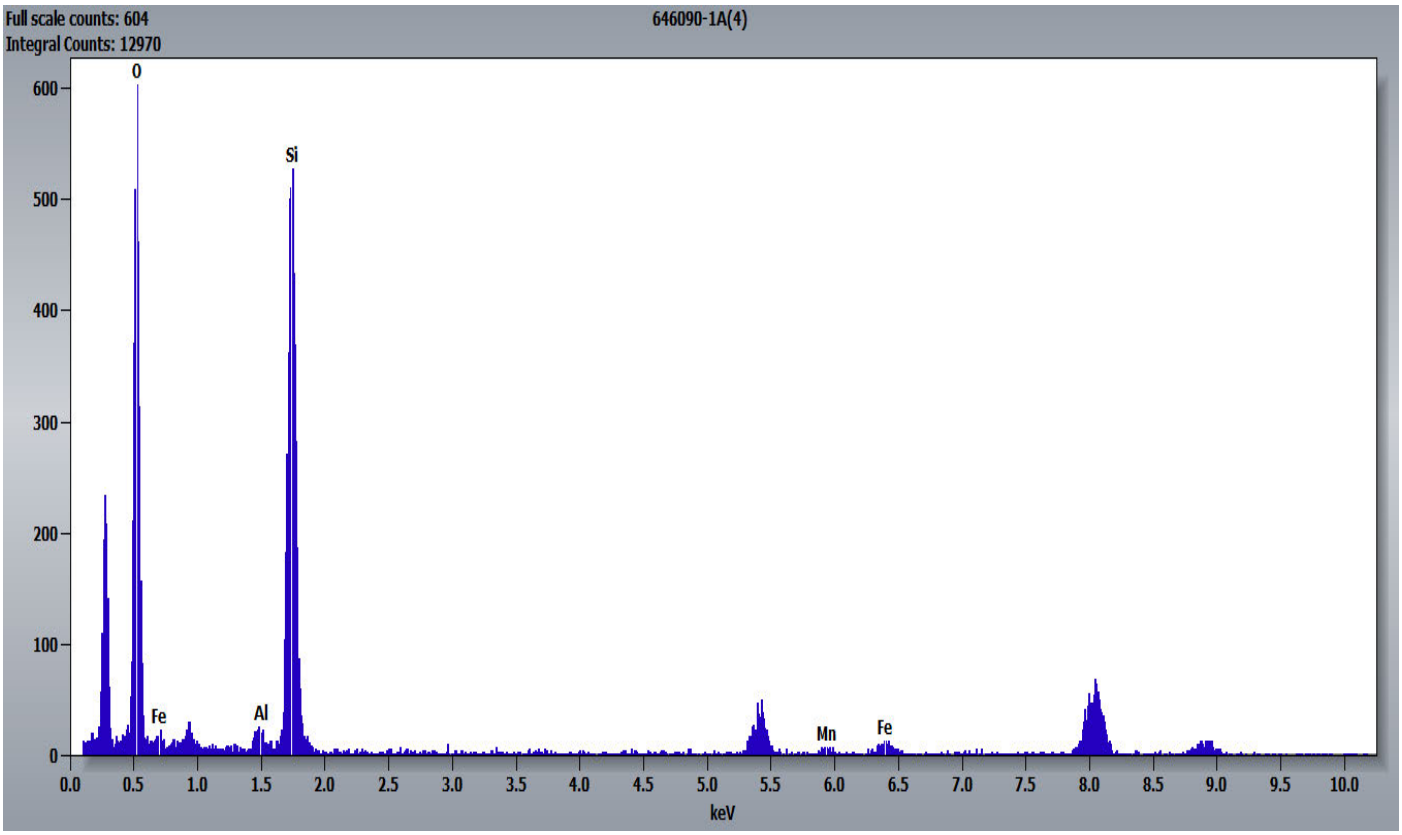
Chemistry from the Carbon Particle Pictured Above



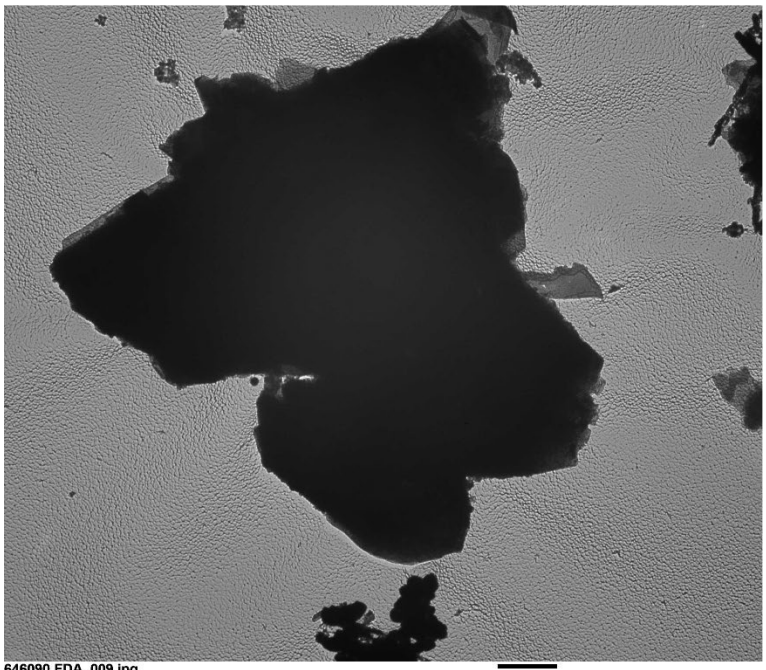
646090-1A, Silicon Particle



Chemistry from the Silicon Particle Pictured Above



646090-1A, Talc Particle

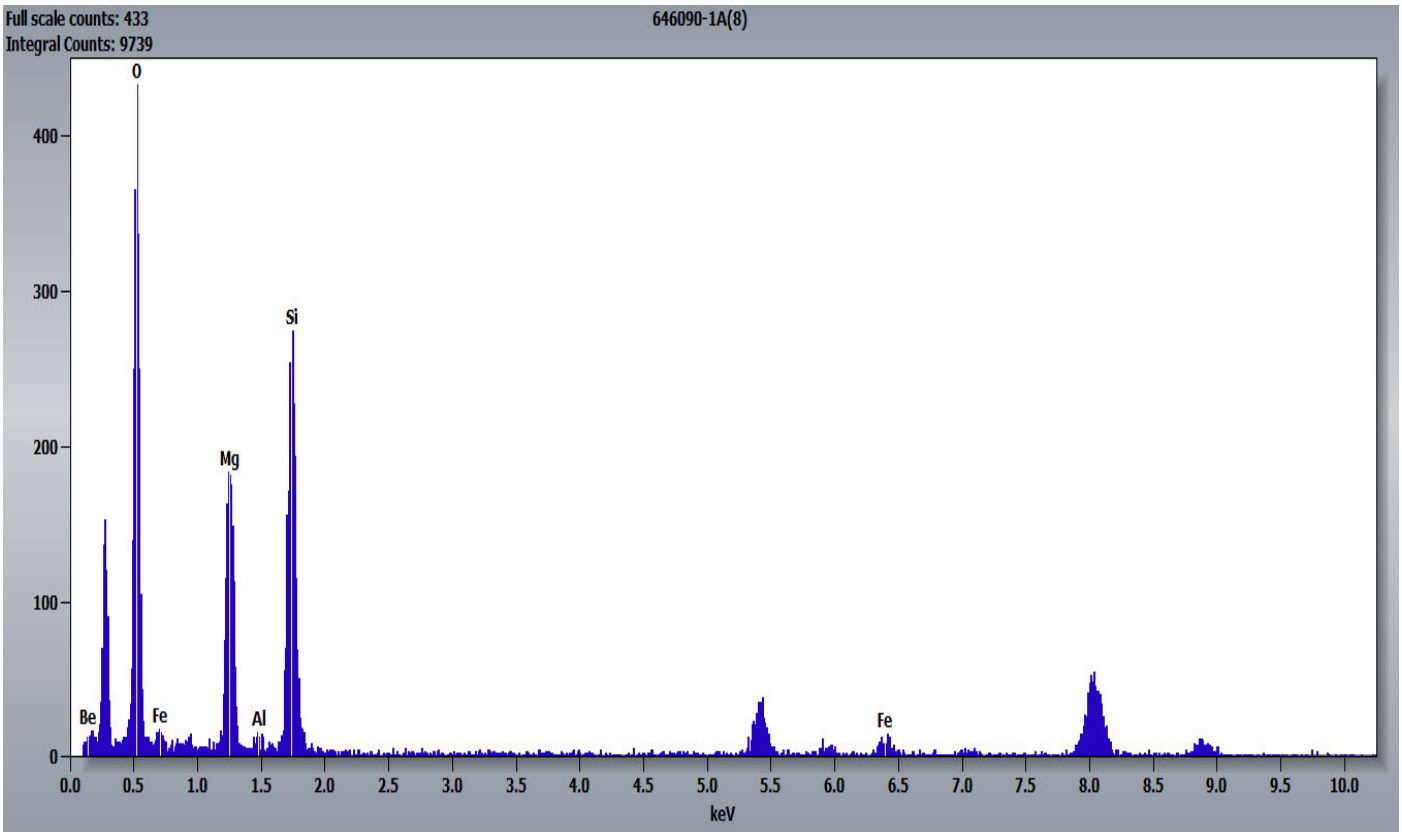


646090 FDA_009.jpg
646090-1A
Talc with some embedded iron particles

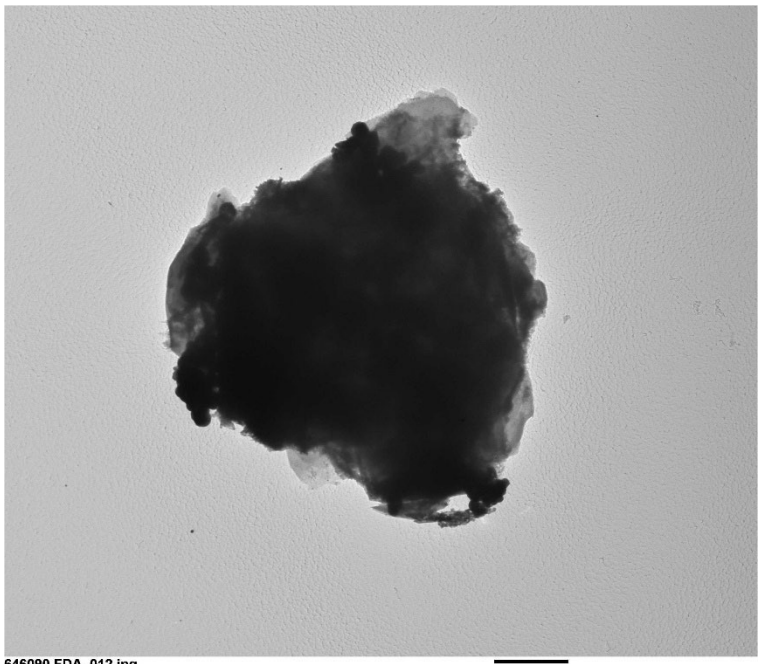
Cal: 0.004774 µm/pix
10:40 2023-05-30
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=80kV
Direct Mag: 2000 x

Chemistry from the Talc Particle Pictured Above



646090-1B, Talc Particle with Iron

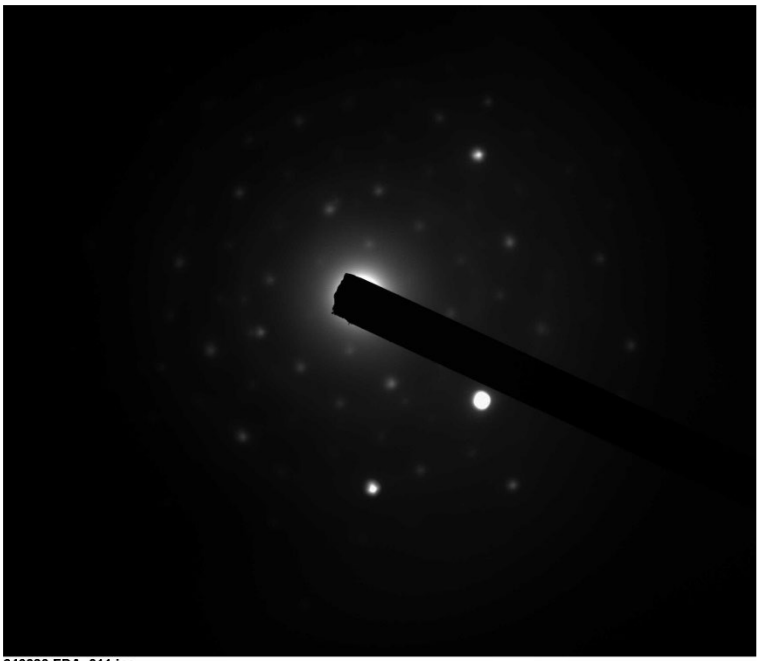


646090 FDA_012.jpg
646090-1B
Talc Particle w/Fe particles

Cal: 0.003819 µm/pix
14:49 2023-05-30
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

1 µm
HV=80kV
Direct Mag: 2500 x

Diffraction Pattern from the Talc with Iron Particle Referenced Above

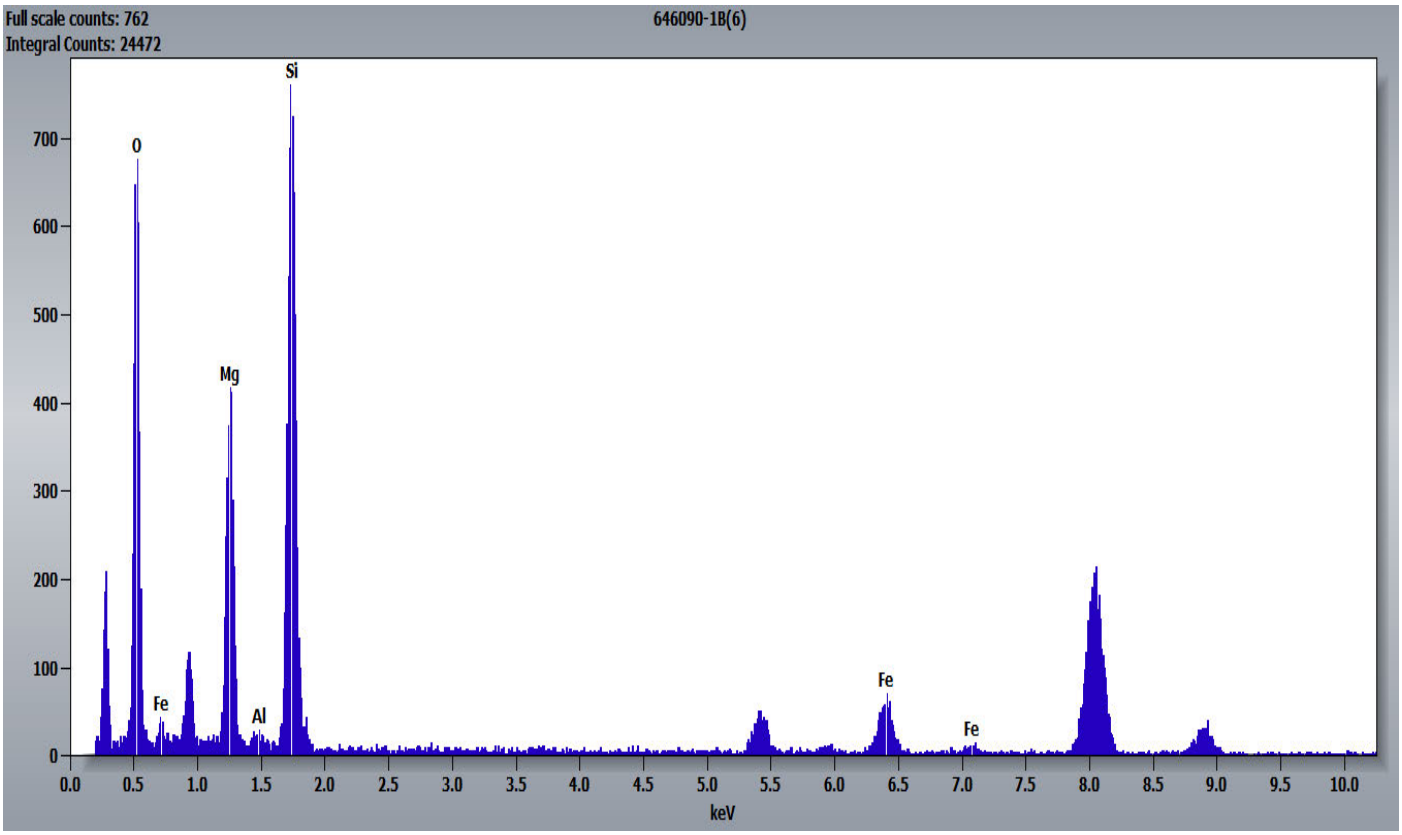


646090 FDA_011.jpg
646090-1B
Talc Particle w/Fe particles

14:47 2023-05-30
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 Particle with Iron Referenced Above



646090-2A, 2B, 2C/Client Sample: 04032023-2

PLM

All three aliquots of sample 04032023-2 were analyzed by (b) (6) on June 9, 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.

646090-2A	No Asbestos Detected
646090-2B	No Asbestos Detected
646090-2C	No Asbestos Detected

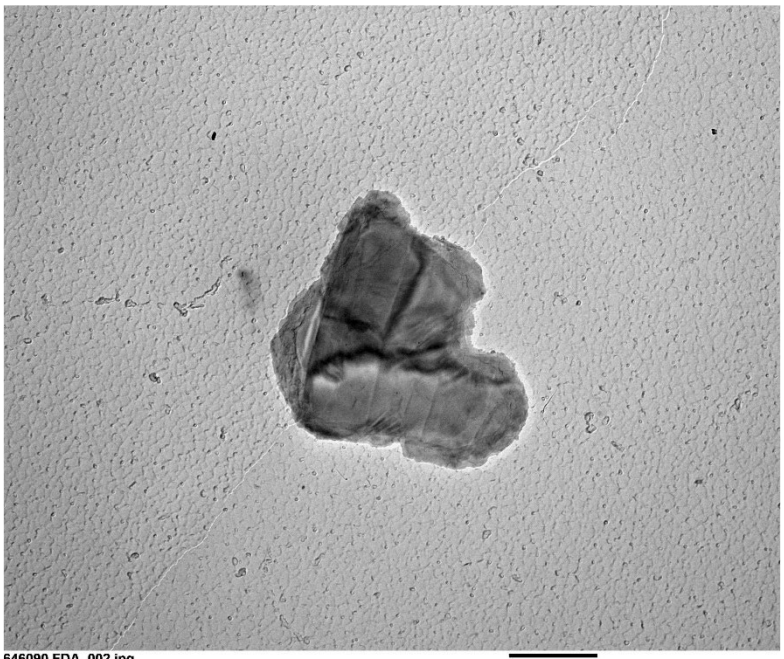
TEM

(b) (6) analyzed aliquot 2A on June 1, 2023. (b) (6) analyzed aliquot 2B on May 31, 2023, and aliquot 2C on June 6, 2023. The primary particle observed was mica; talc particles, iron particles, silica spheres, and titanium particles area also observed along with talc ribbons/fibers, and particles containing phosphorus and Calcium. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

646090-2A	No Asbestos Detected
646090-2B	No Asbestos Detected
646090-2C	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.

646090-2A, Mica Particle

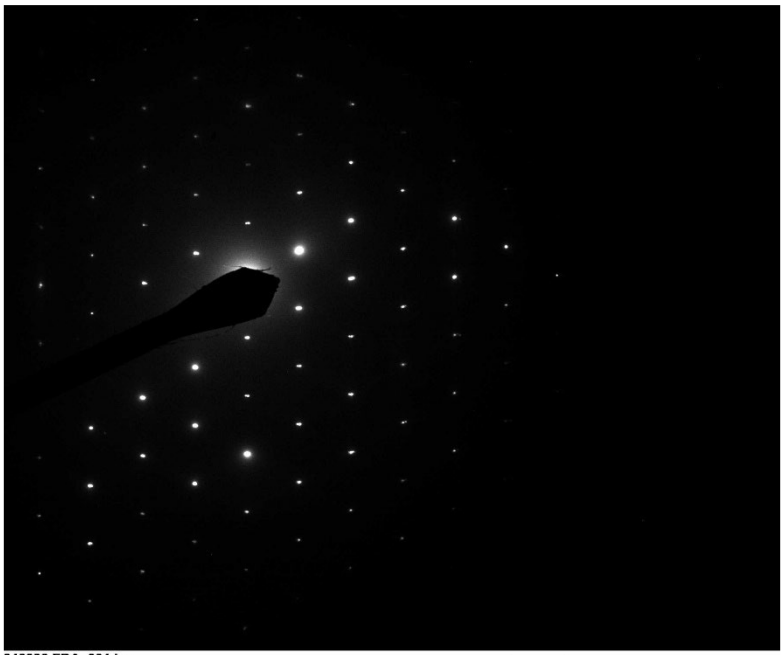


646090 FDA_002.jpg
646090-2A
Mica Particle

Cal: 0.002145 µm/pix
18:16 2023-06-01
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=100kV
Direct Mag: 4800 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

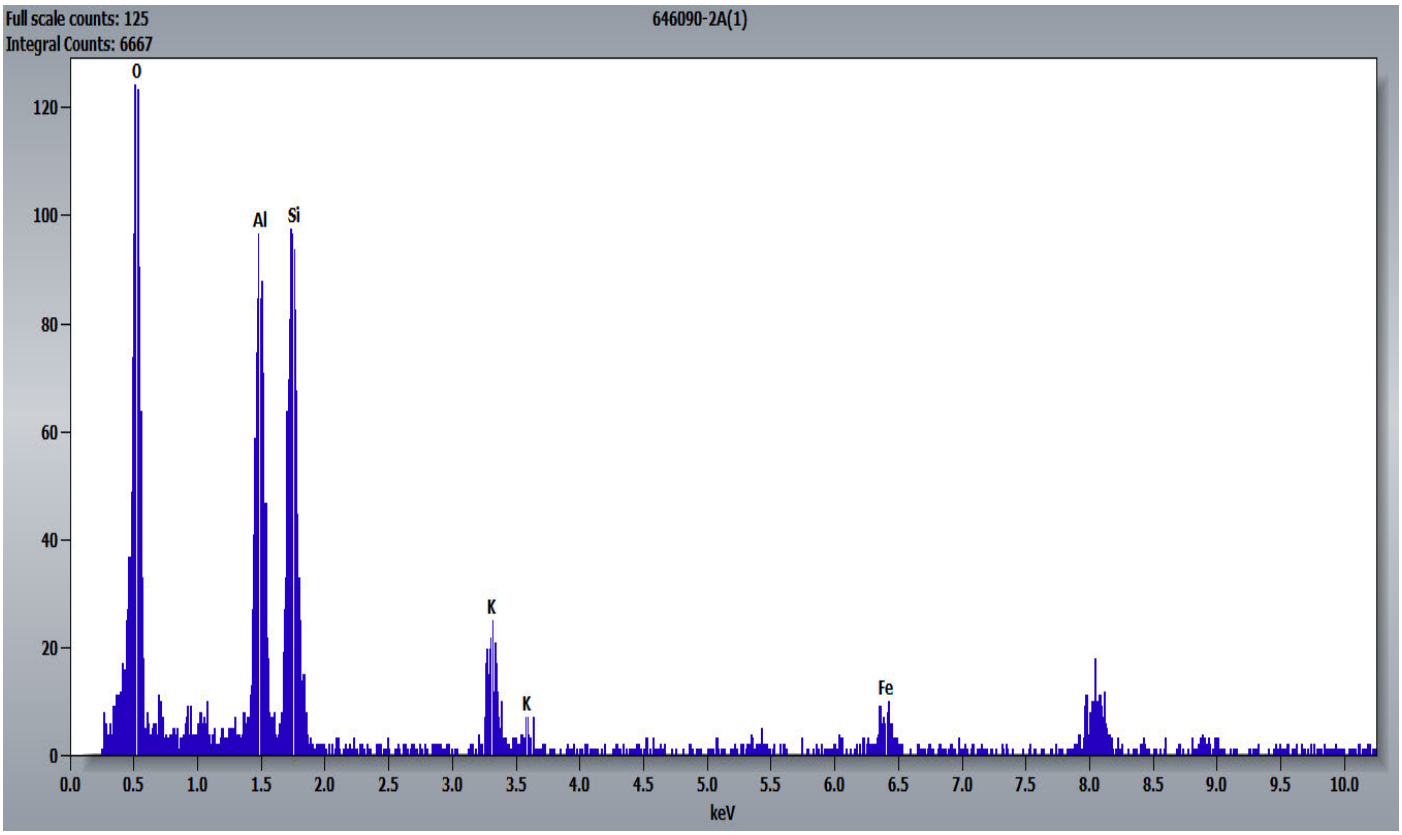


646090 FDA_001.jpg
646090-2A
Mica Particle

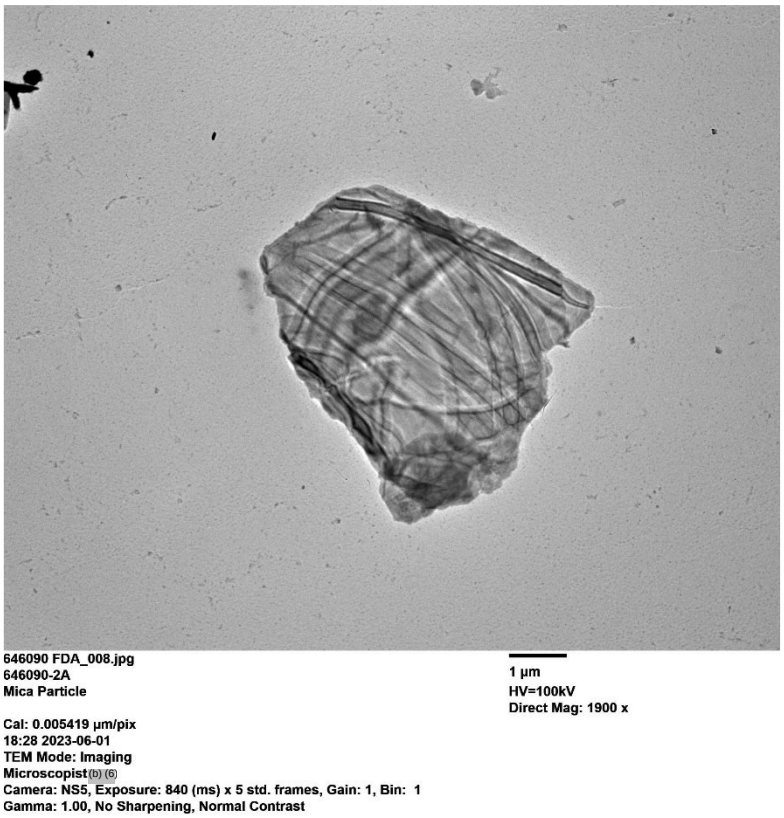
18:15 2023-06-01
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Mica Particle Pictured Above



646090-2A, Mica Particle



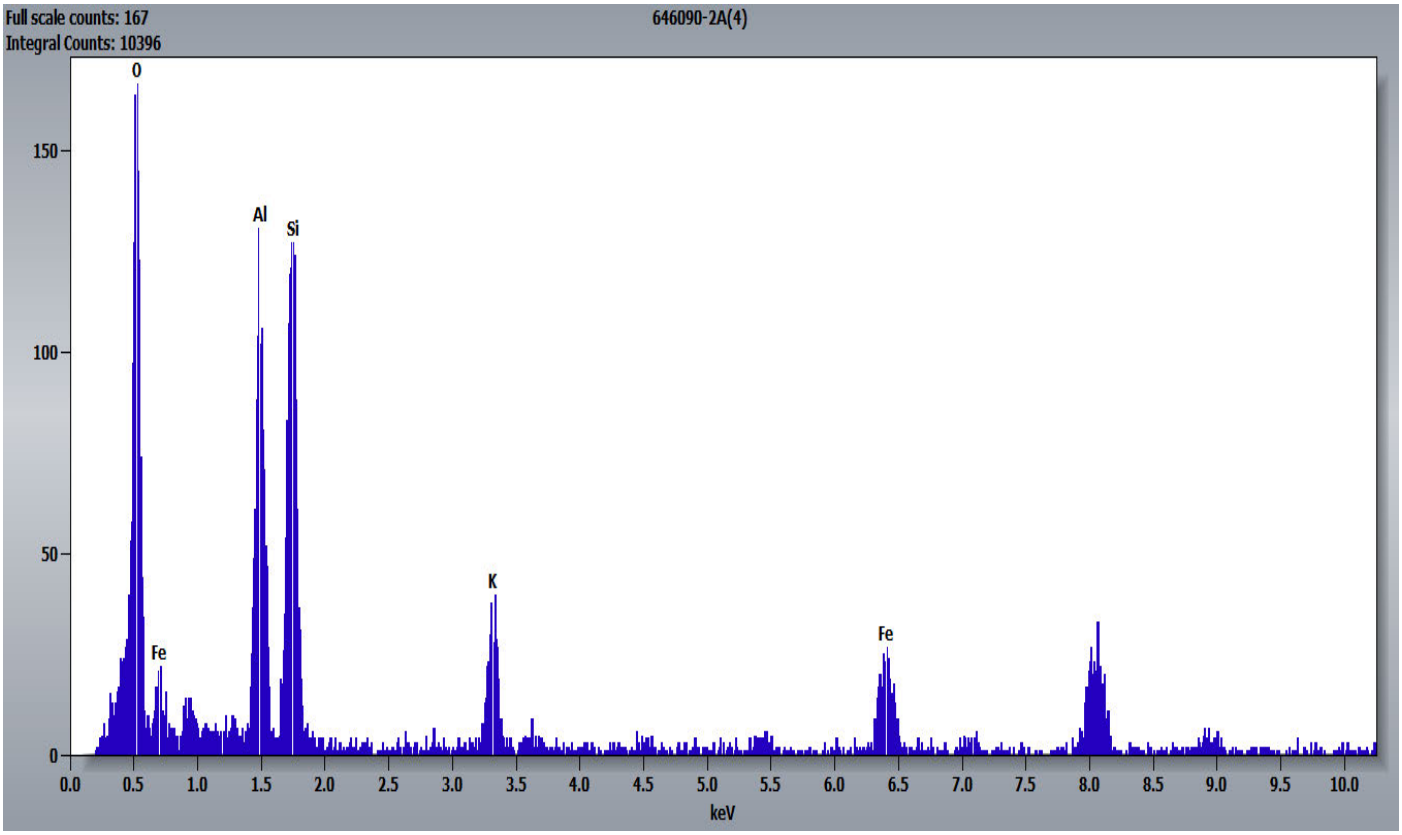
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

646090 FDA_007.jpg
646090-2A
Mica Particle

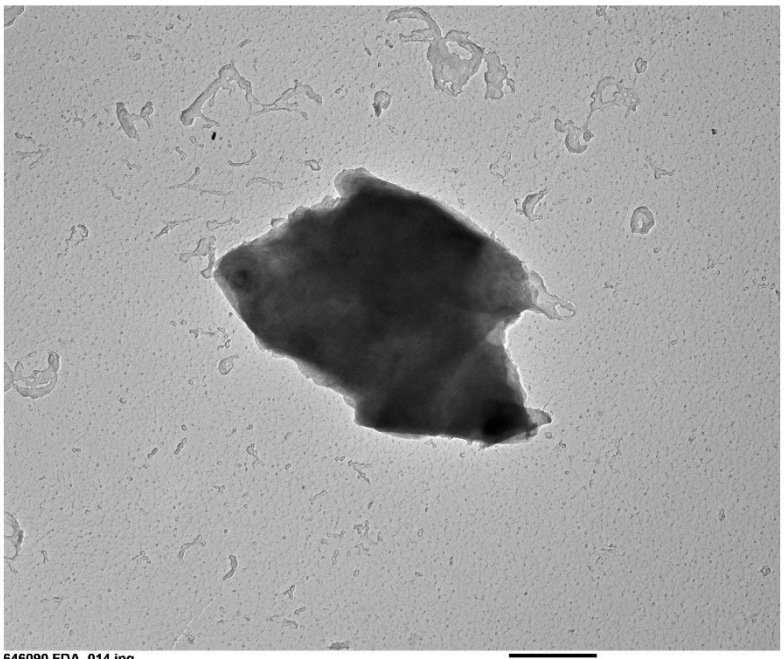
Cal: 0.001030 µm/pix
18:27 2023-06-01
TEM Mode: Diffraction
Microscopist:
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Mica Particle Pictured Above



646090-2A, Talc Particle

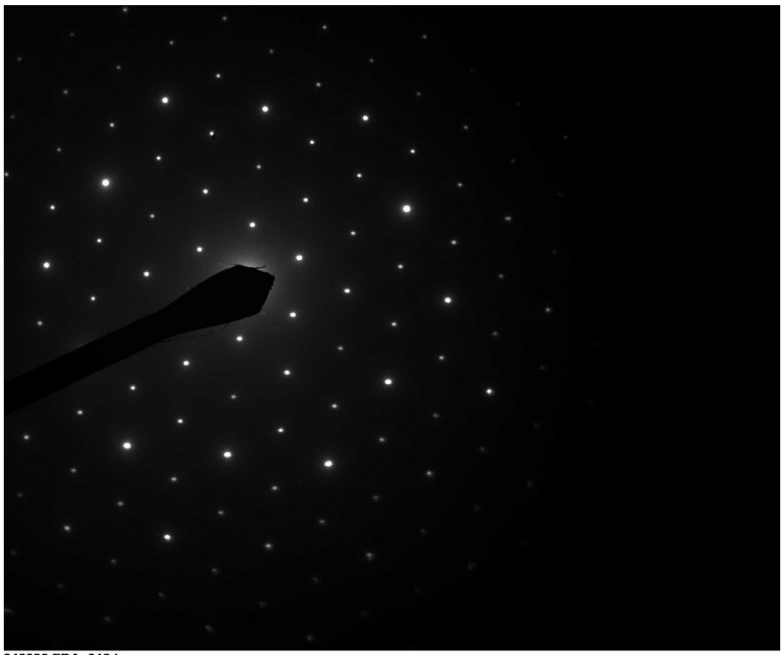


646090 FDA_014.jpg
646090-2A
Talc Particle

Cal: 0.002860 µm/pix
18:46 2023-06-01
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

800 nm
HV=100kV
Direct Mag: 3600 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

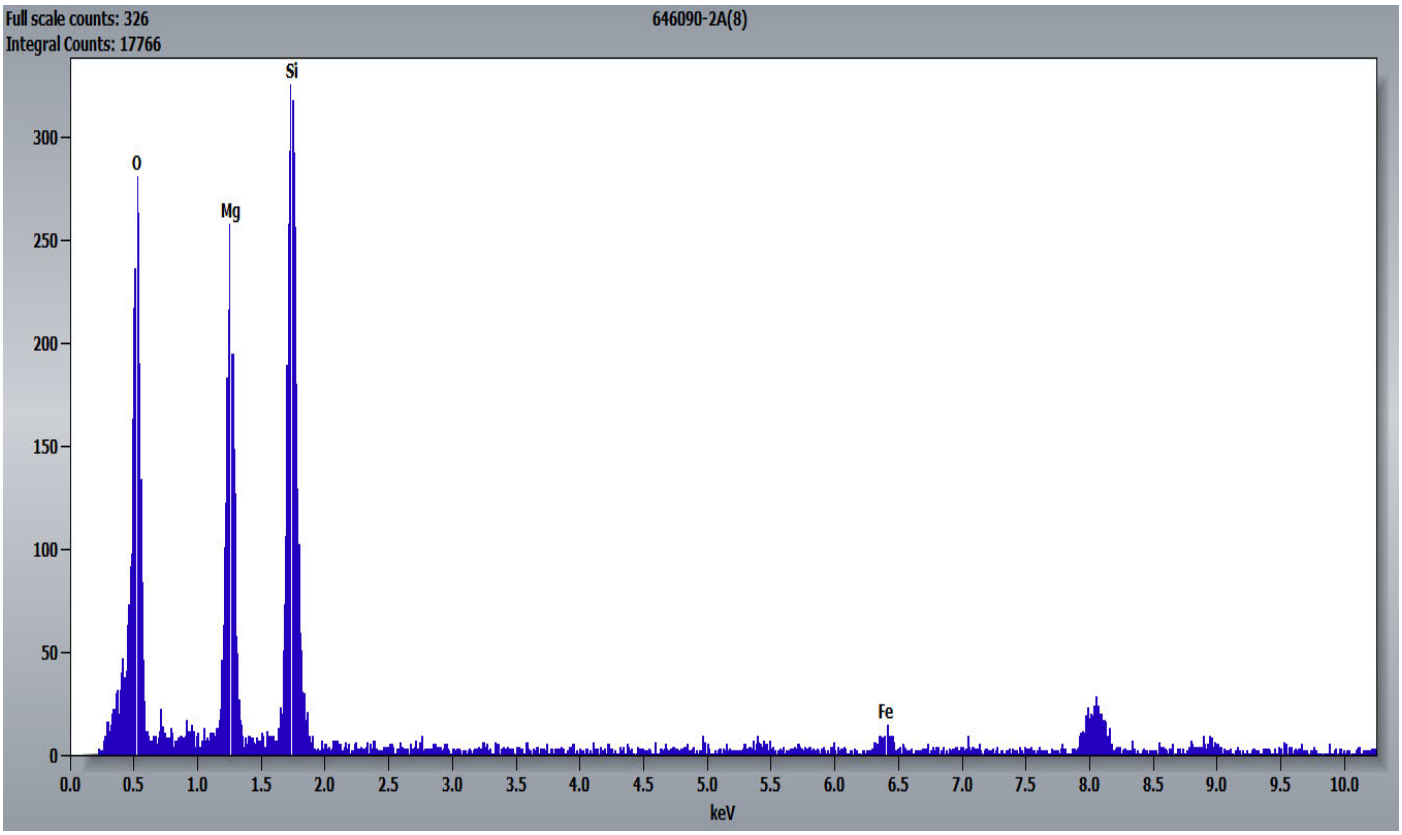


646090 FDA_013.jpg
646090-2A
Talc Particle

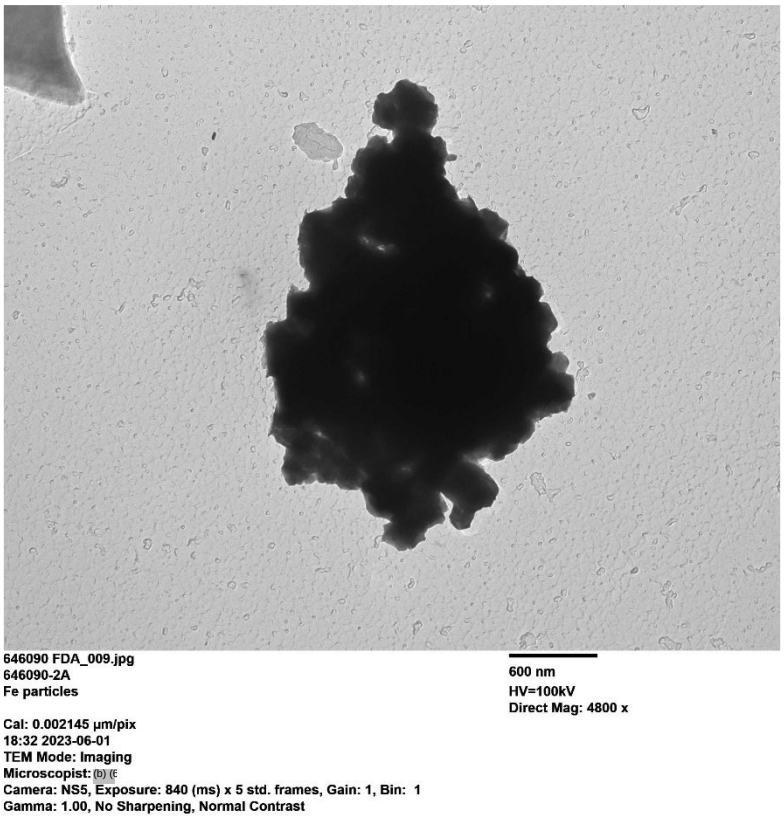
Cal: 0.001030 µm/pix
18:42 2023-06-01
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

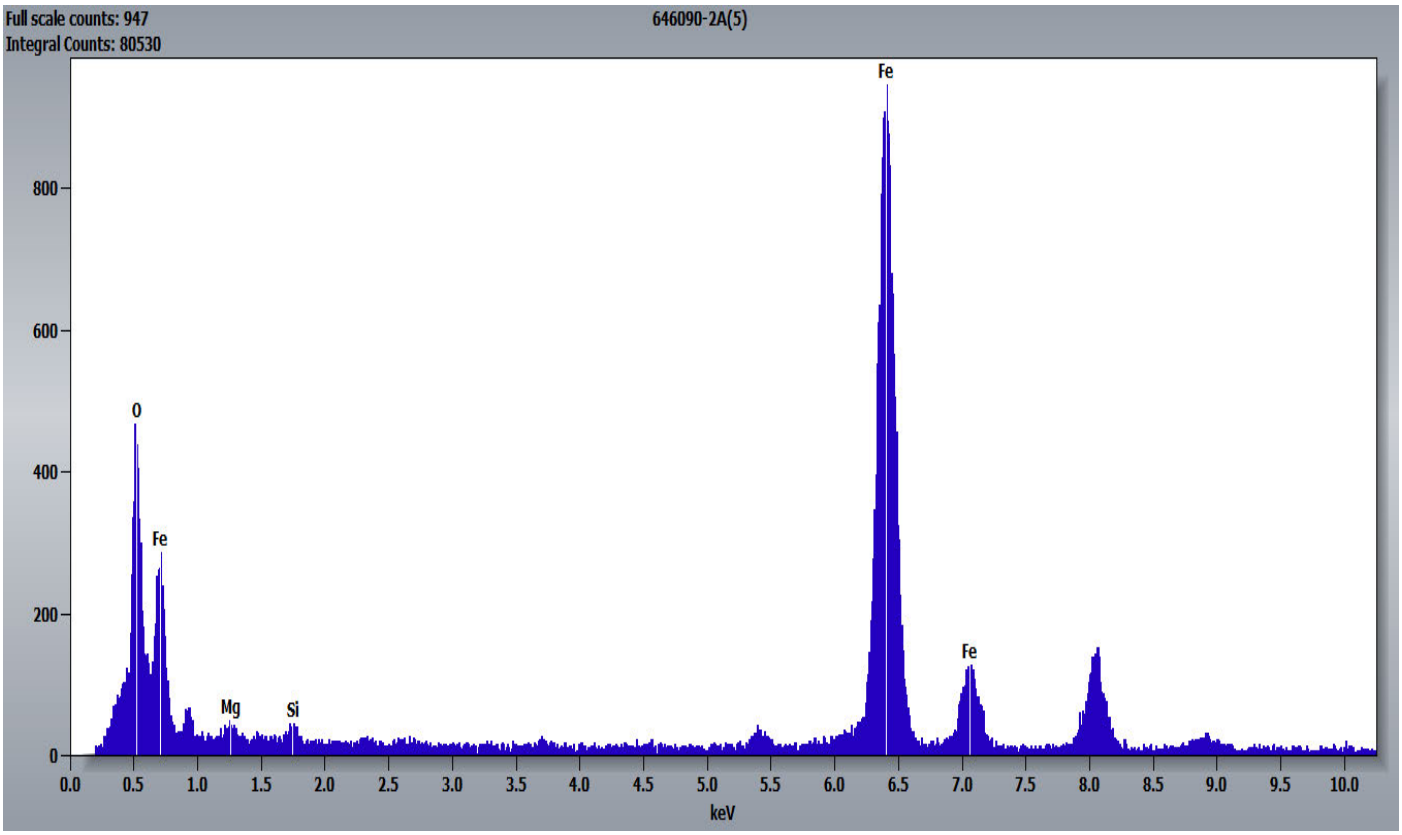
Chemistry from the Talc Particle Pictured Above



646090-2A, Iron Particles



Chemistry from the Iron Particles Pictured Above



646090-2A, Elongated Iron Particle

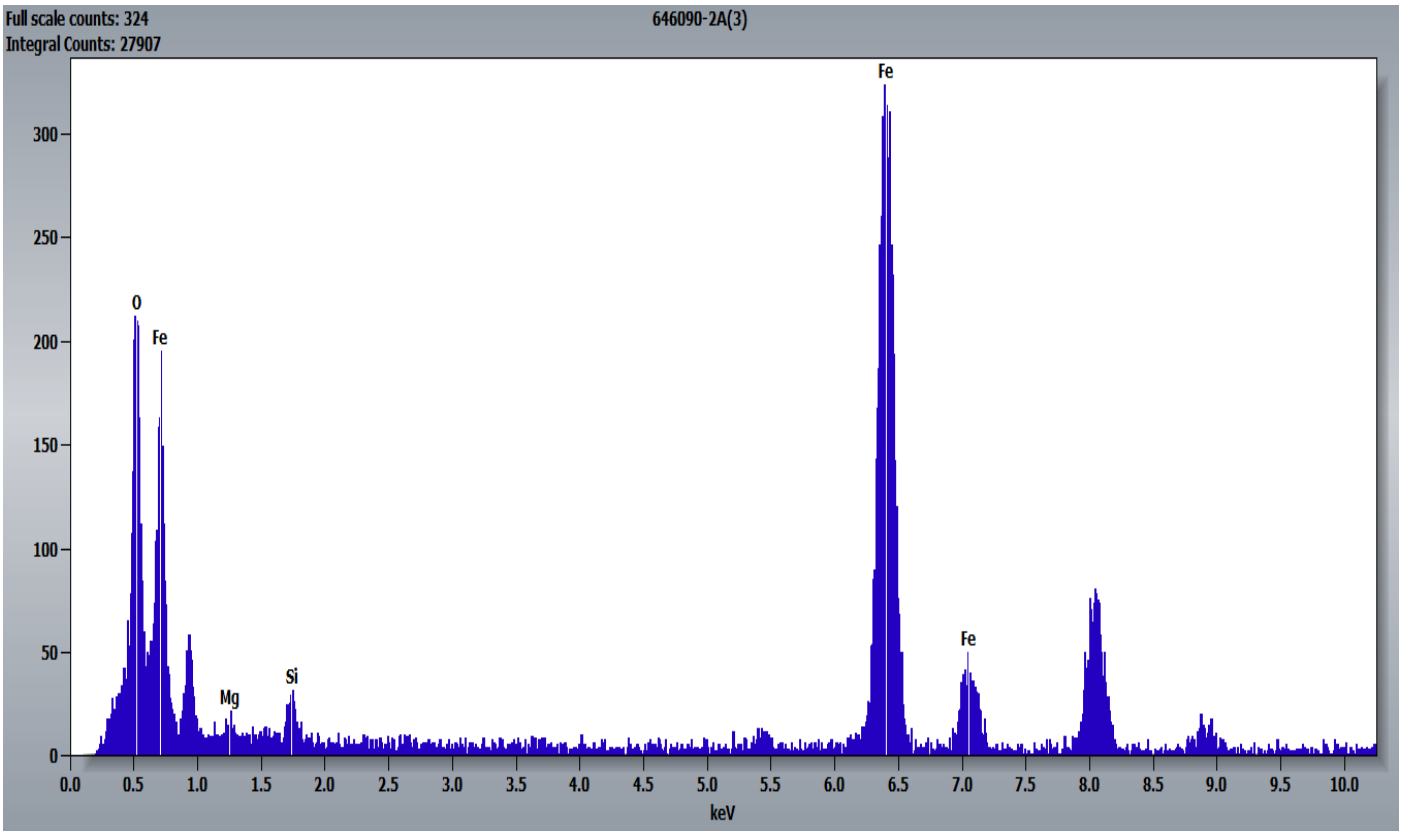
Diffraction Pattern from the Elongated Iron Particle Pictured Above

646090 FDA_005.jpg
646090-2A
Fe Fiber

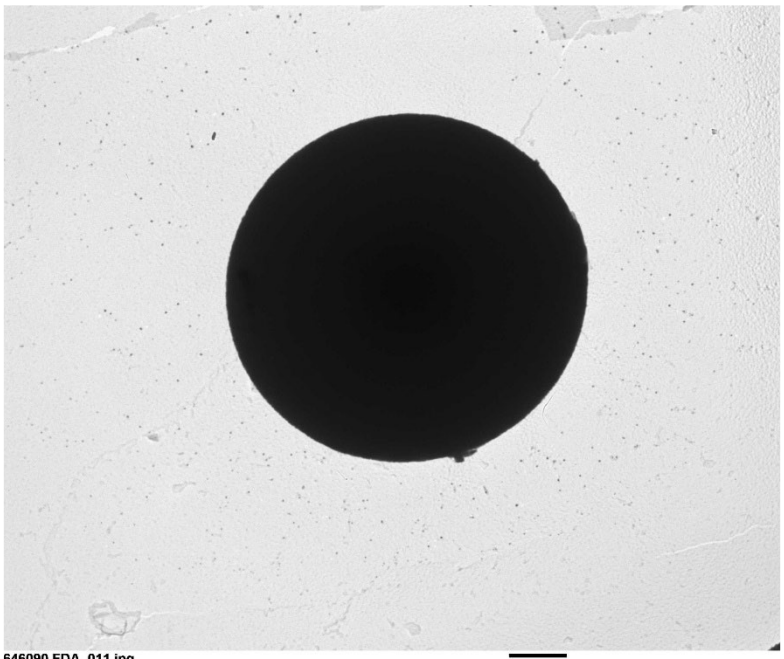
Cal: 0.005419 µm/pix
18:22 2023-06-01
TEM Mode: Diffraction
Microscopist(b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Elongated Iron Particle Pictured Above



646090-2A, Silica Sphere

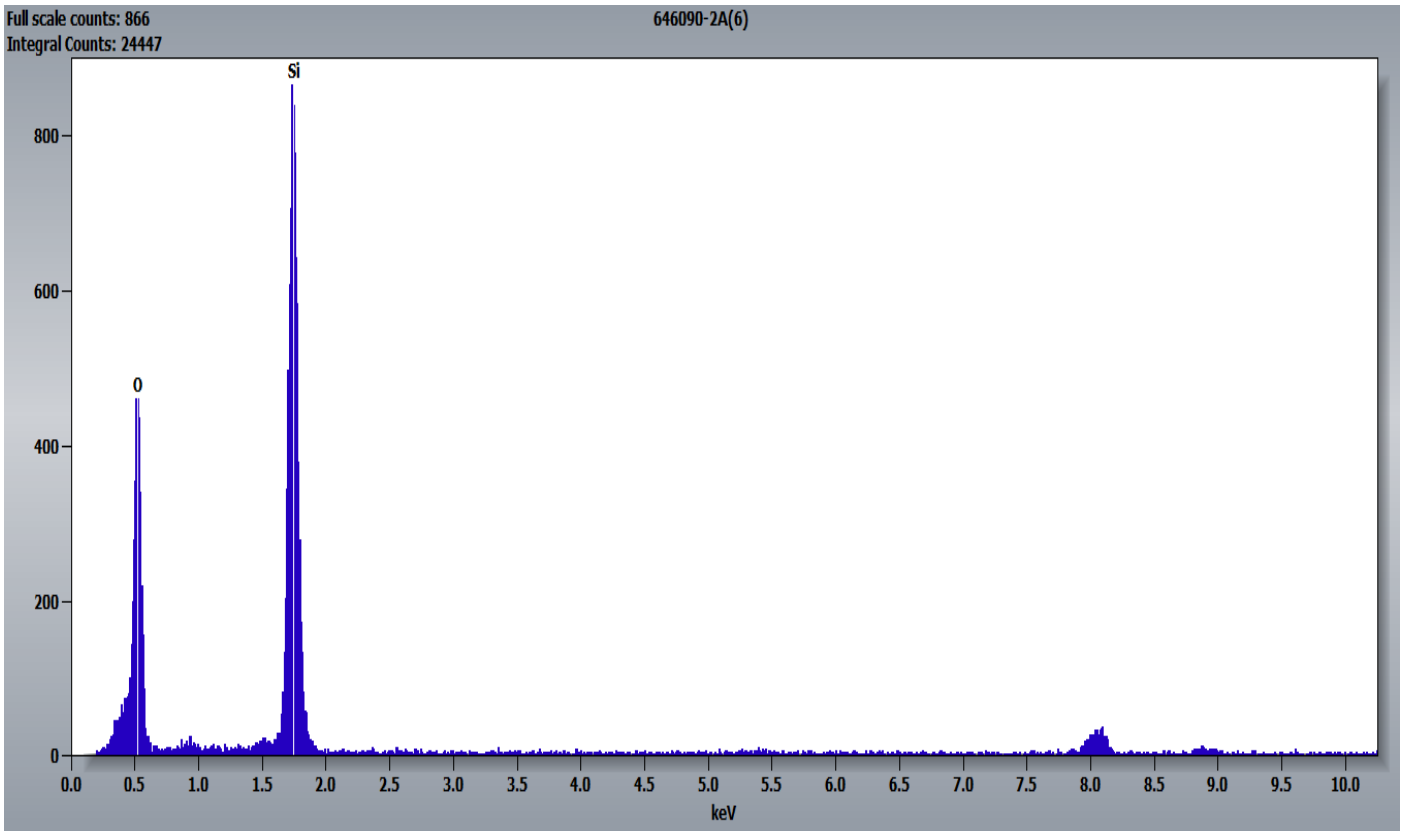


646090 FDA_011.jpg
646090-2A
Silica Sphere

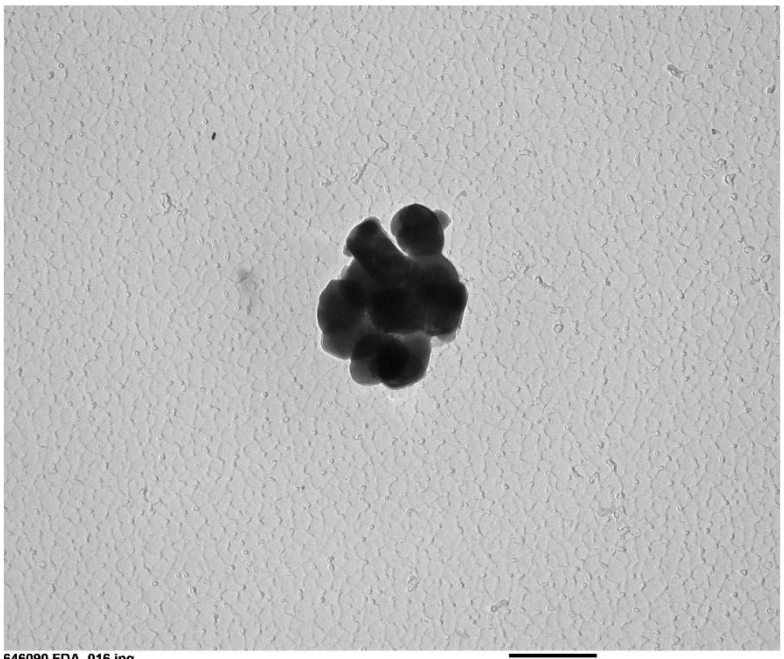
Cal: 0.005419 µm/pix
18:35 2023-06-01
TEM Mode: Imaging
Microscopist:
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=100kV
Direct Mag: 1900 x

Chemistry from the Silica Sphere Pictured Above



646090-2A, Titanium Particles



646090 FDA_016.jpg
646090-2A
Ti particles

Cal: 0.001430 µm/pix
19:06 2023-06-01
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x

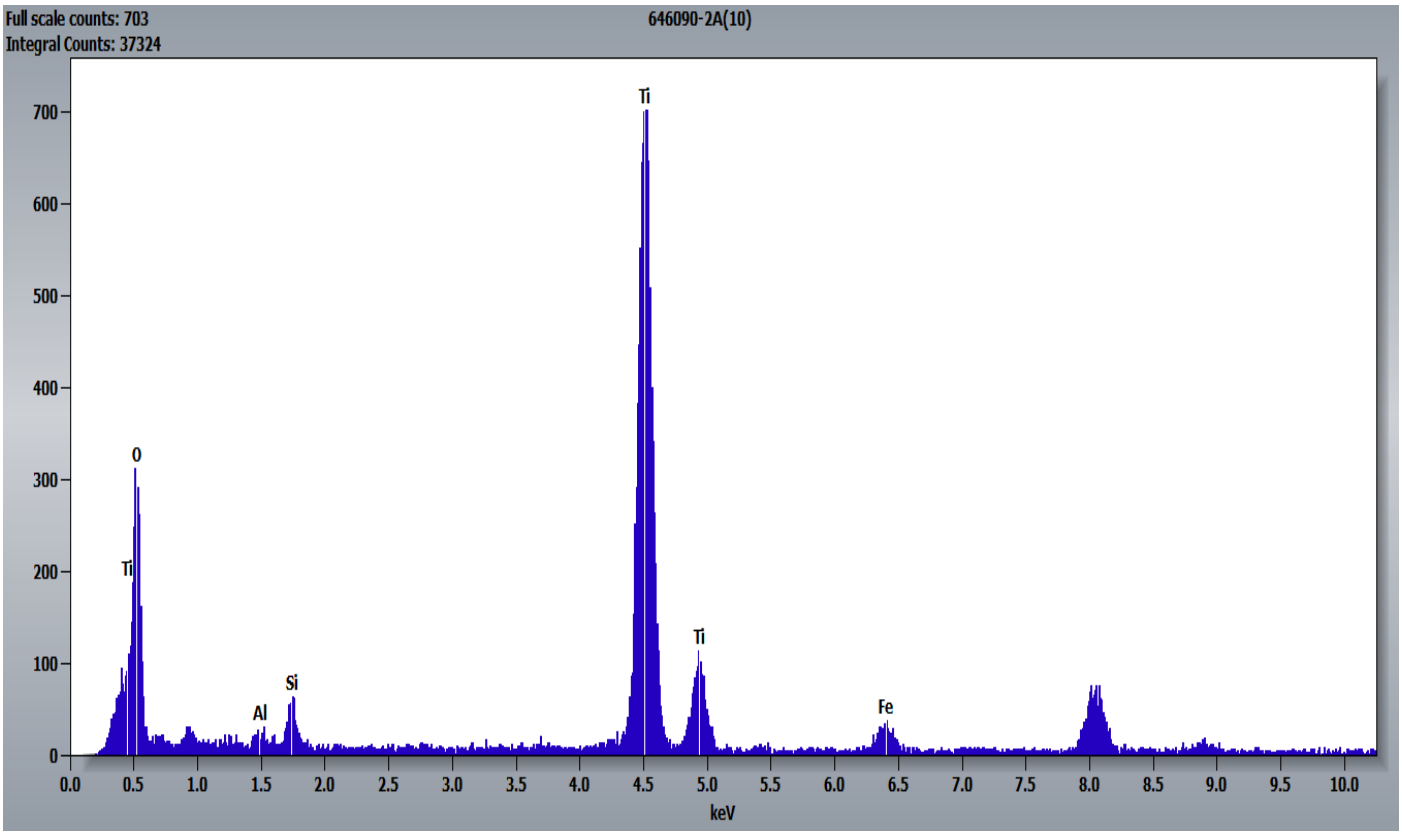
Diffraction Pattern from the Titanium Particles Pictured Above

646090 FDA_015.jpg
646090-2A
Ti particles

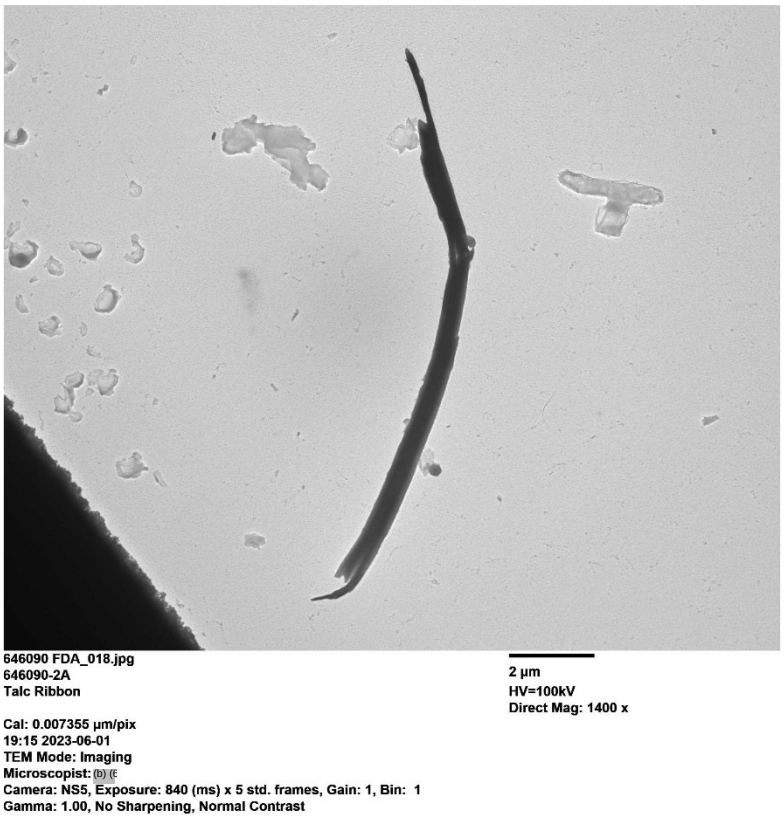
Cal: 0.002860 µm/pix
19:05 2023-06-01
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

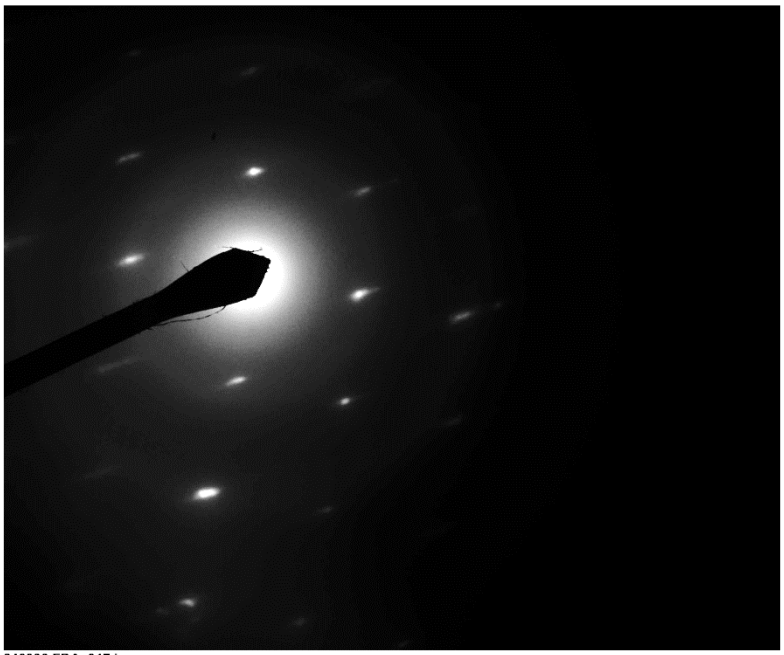
Chemistry from the Titanium Particles Pictured Above



646090-2A, Talc Ribbon



Diffraction Pattern from the Talc Ribbon Pictured Above

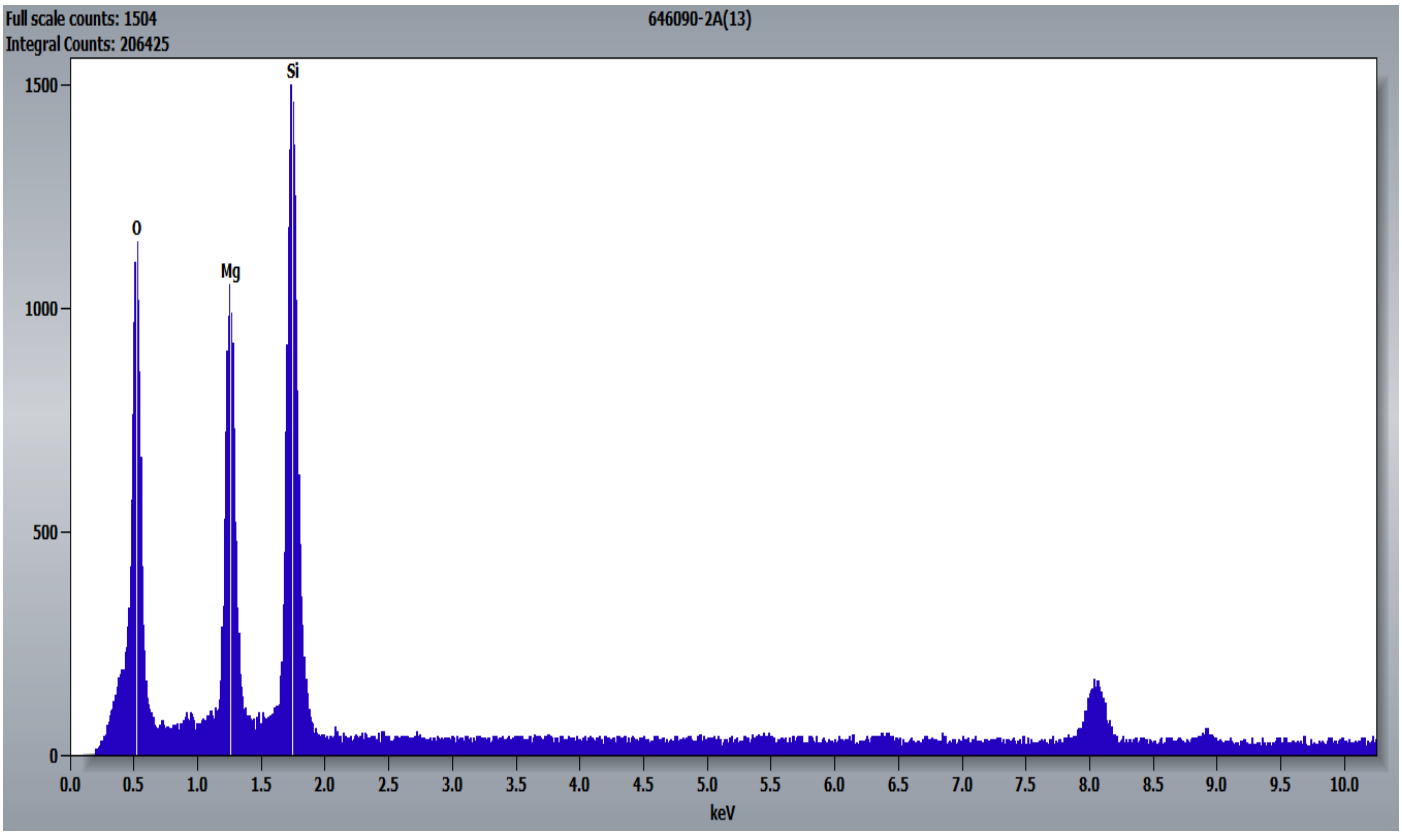


646090 FDA_017.jpg
646090-2A
Talc Ribbon

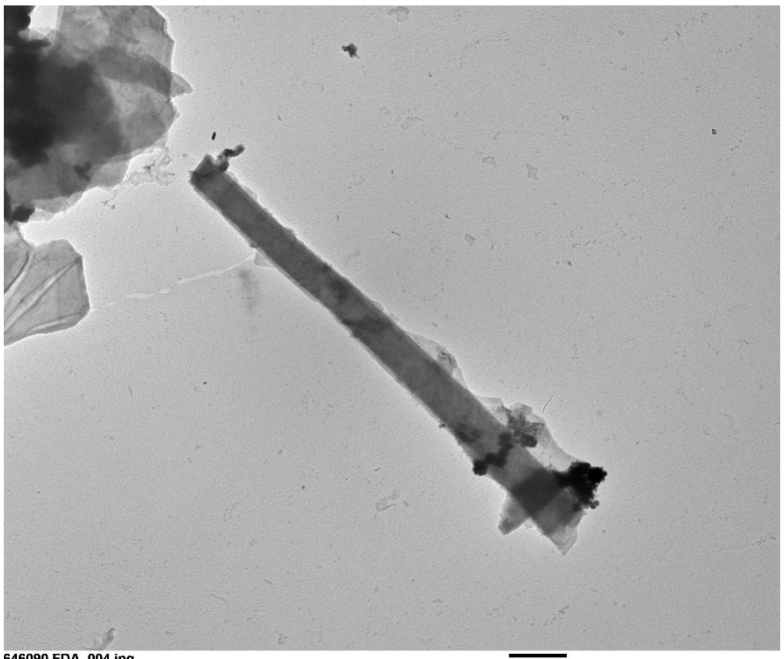
Cal: 0.001430 µm/pix
19:13 2023-06-01
TEM Mode: Diffraction
Microscopist
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Talc Ribbon Pictured Above



646090-2A, Elongated Talc Particle

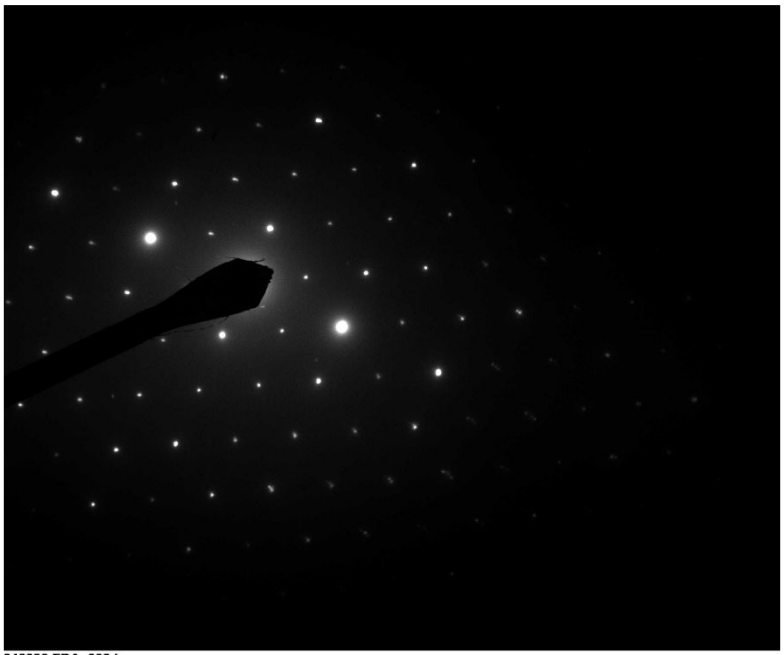


646090 FDA_004.jpg
646090-2A
Talc Fiber

Cal: 0.005419 µm/pix
18:20 2023-06-01
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=100kV
Direct Mag: 1900 x

Hexagonal Diffraction Pattern from the Elongated Talc Pictured Above

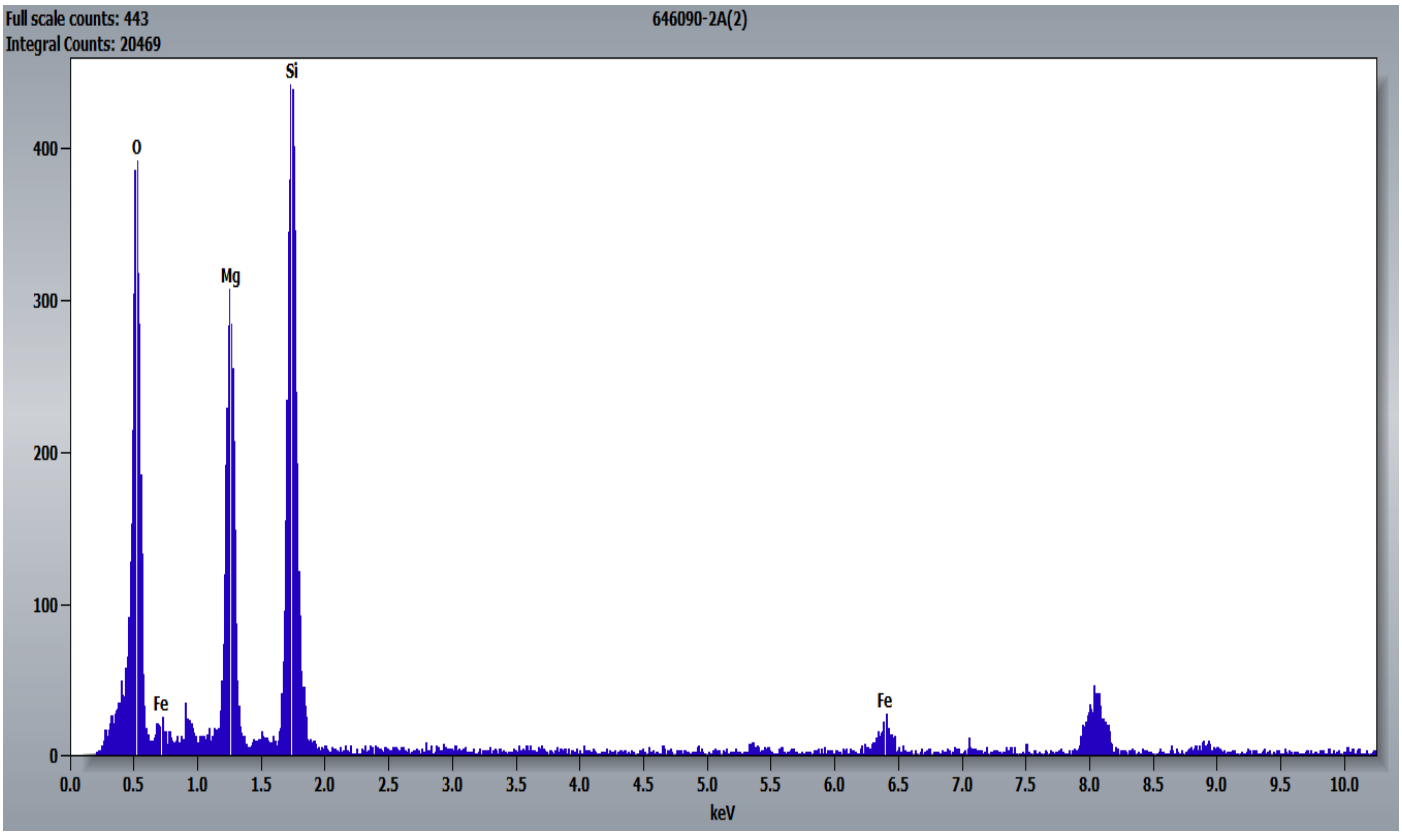


646090 FDA_003.jpg
646090-2A
Talc Fiber

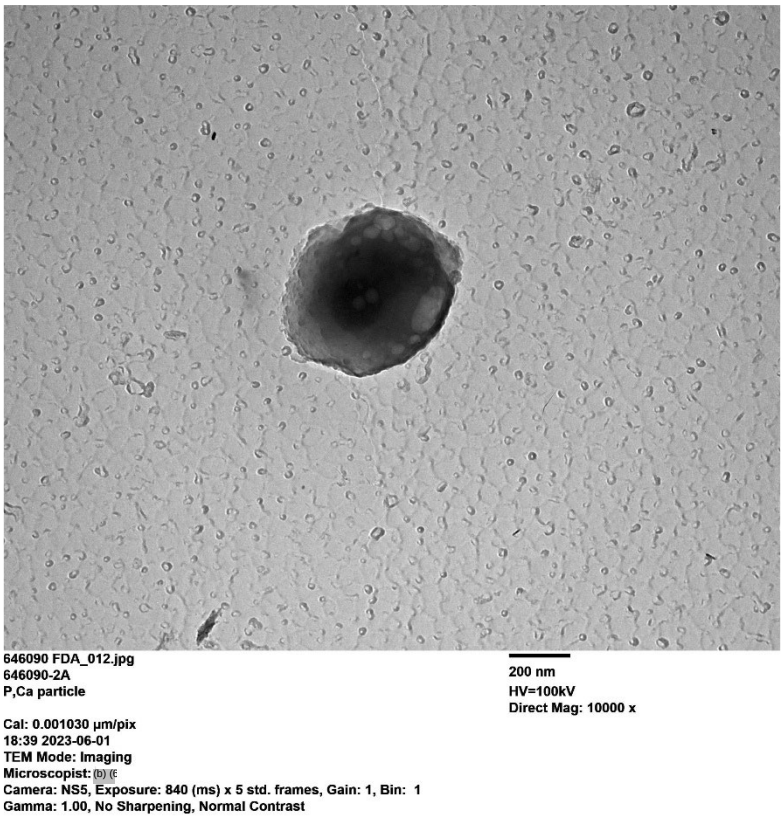
Cal: 0.002145 µm/pix
18:19 2023-06-01
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

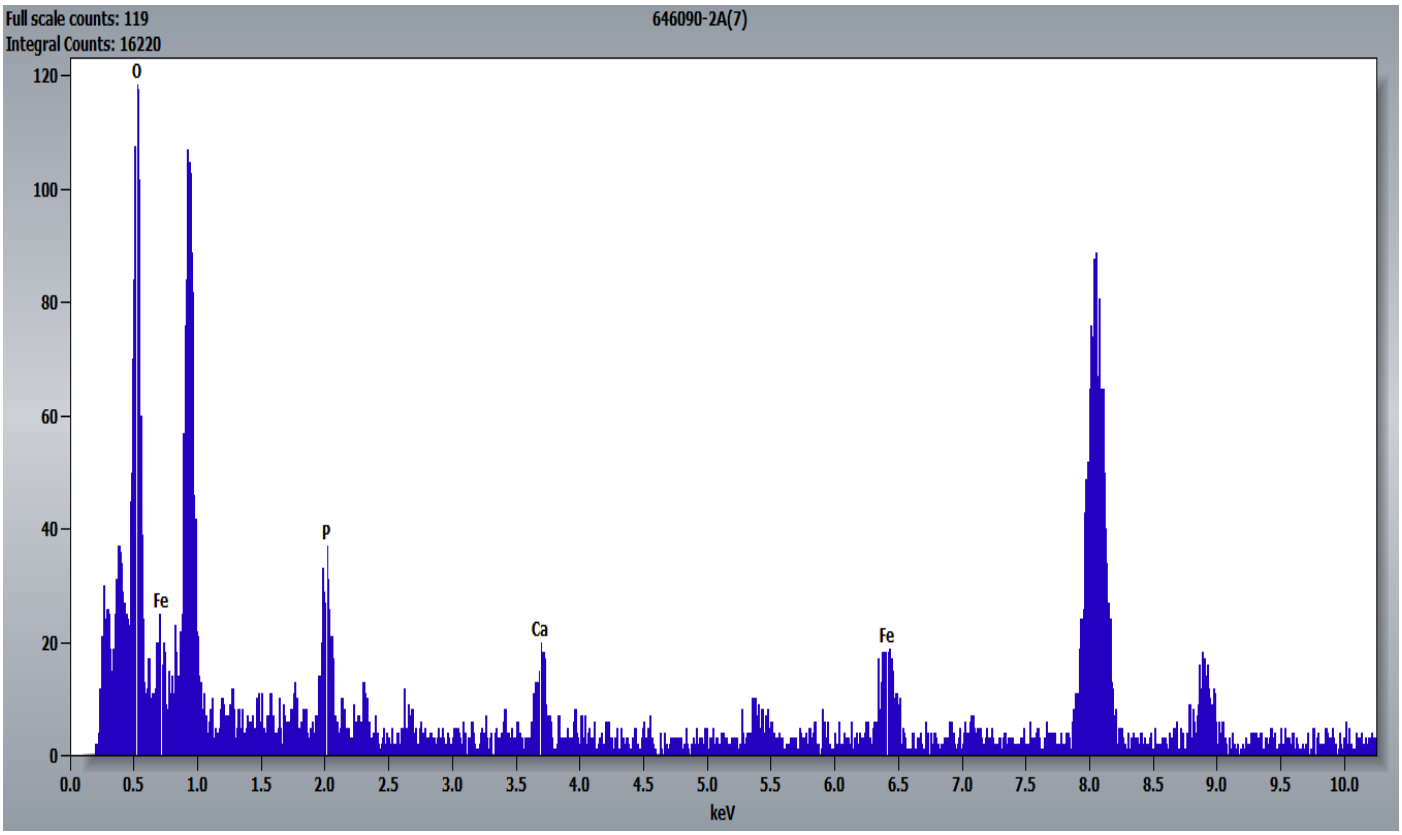
Chemistry from the Elongated Talc Particle Pictured Above



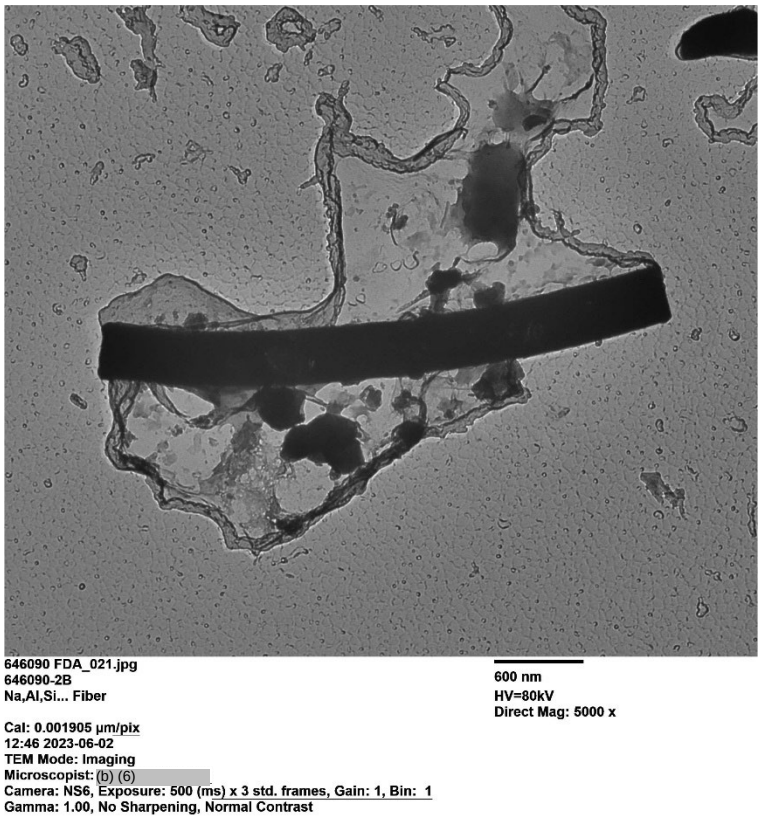
646090-2A, Particle Containing Phosphorus and Calcium



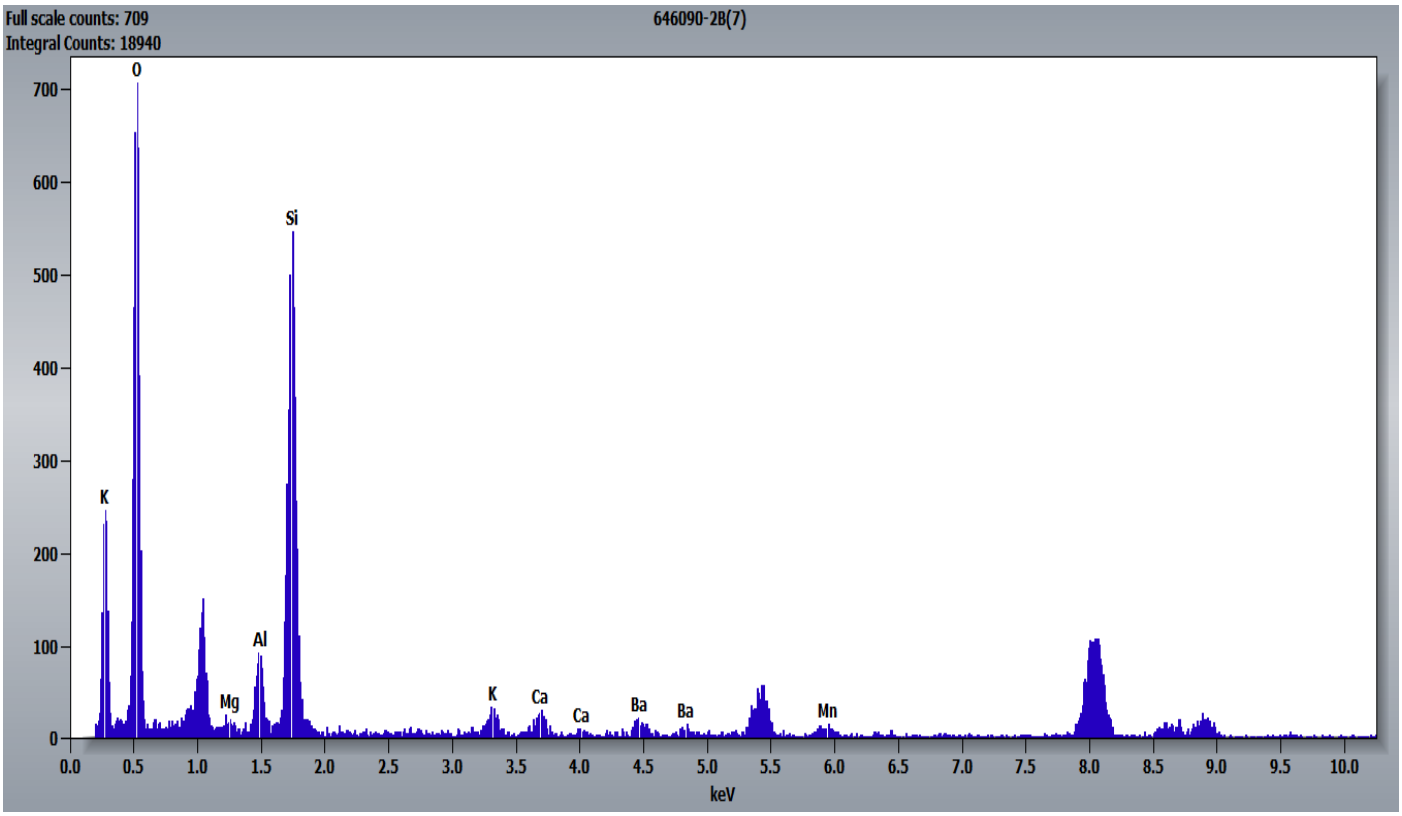
Chemistry from the Particle Containing Phosphorus and Calcium Pictured Above



646090-2B, Particle Containing Potassium, Oxygen, Magnesium, Aluminum, Silicon, Calcium, Barium, and Manganese



Chemistry from the Particle Containing Potassium, Oxygen, Magnesium, Aluminum, Silicon, Calcium, Barium, and Manganese Pictured Above



646090-3A, 3B, 3C/Client Sample: 04032023-3

PLM

All three aliquots of sample 04032023-3 were analyzed by (b) (6) on June 9, 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.

646090-3A	No Asbestos Detected
646090-3B	No Asbestos Detected
646090-3C	No Asbestos Detected

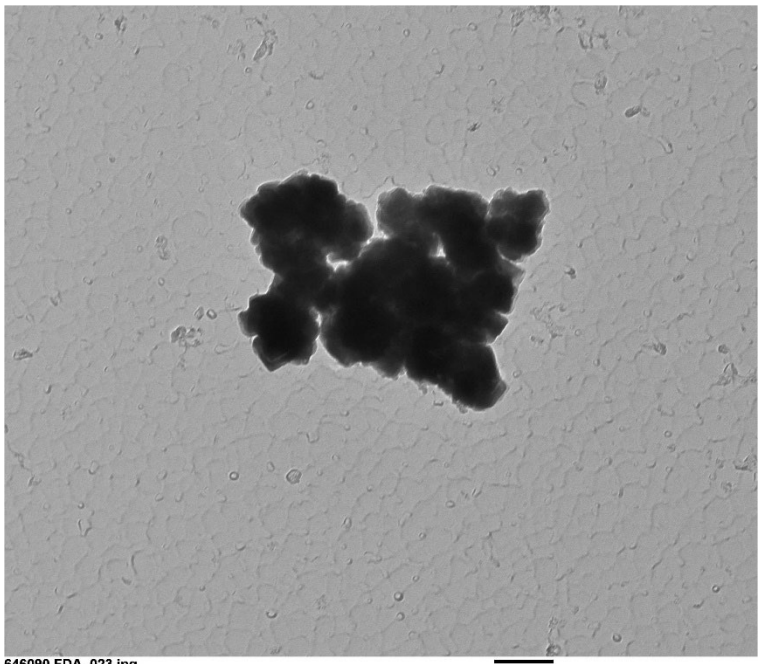
TEM

(b) (6) analyzed aliquot 3A on June 5, 2023. (b) (6) analyzed aliquot 3B on June 6, 2023, and aliquot 3C on June 7, 2023. The primary particle observed was iron; mica particles with titanium and iron were also observed along with silicon and talc 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.

646090-3A	No Asbestos Detected
646090-3B	No Asbestos Detected
646090-3C	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.

646090-3A, Iron Particles

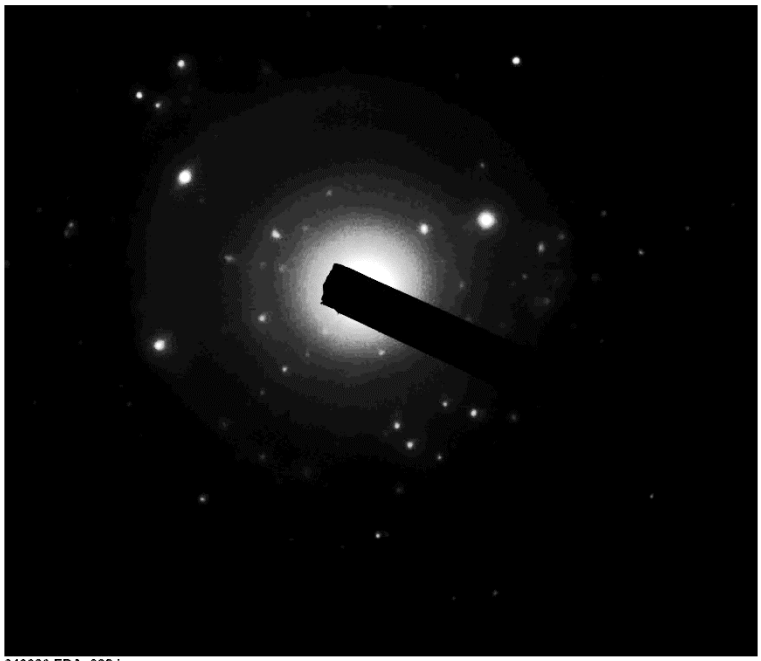


646090 FDA_023.jpg
646090-3A
Fe Particles

Cal: 0.000955 µm/pix
15:49 2023-06-05
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

200 nm
HV=80kV
Direct Mag: 10000 x

Diffraction Pattern from the Iron Particles Pictured Above

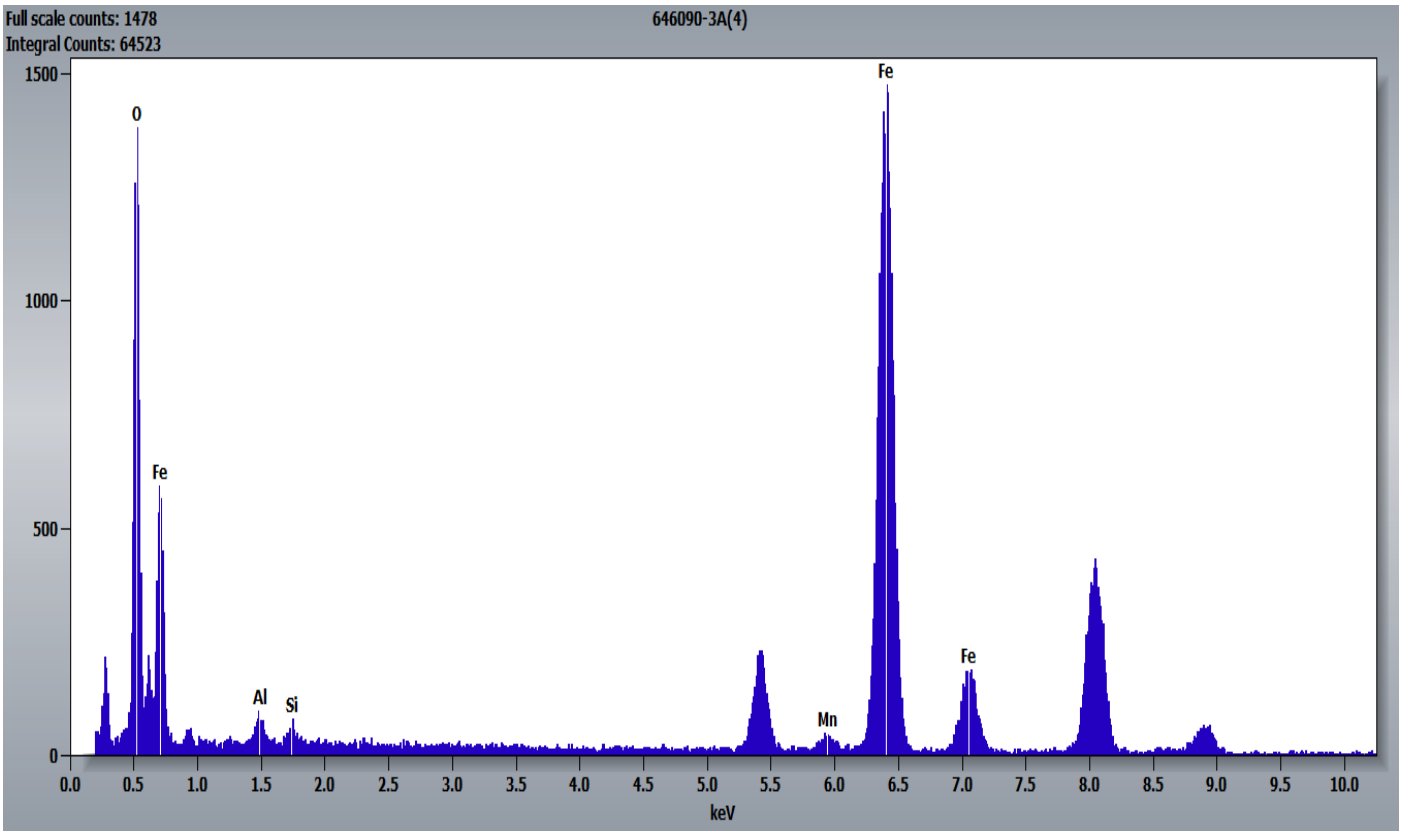


646090 FDA_022.jpg
646090-3A
Fe Particles

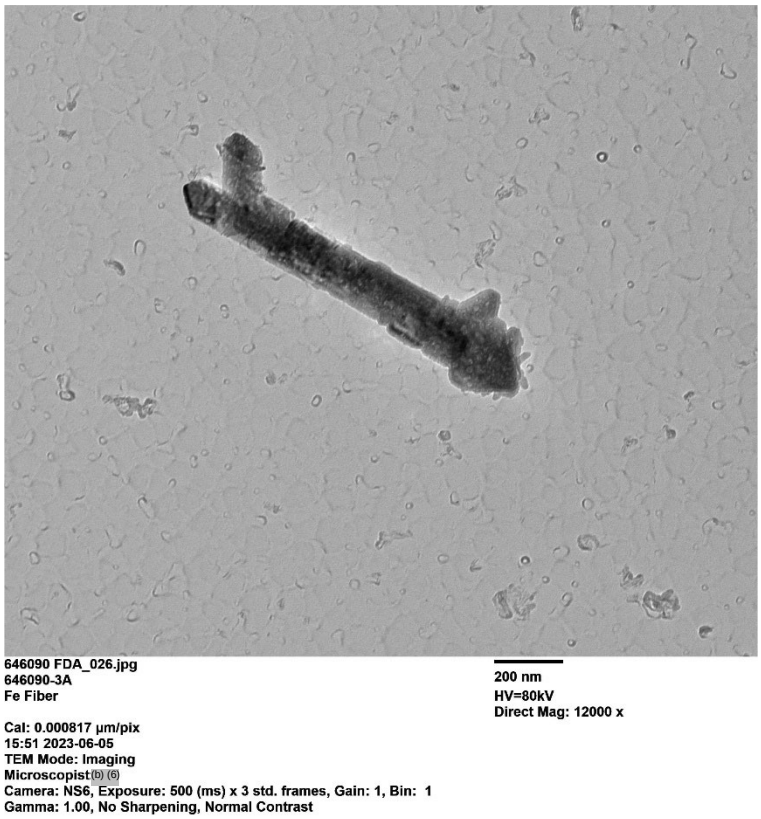
15:47 2023-06-05
TEM Mode: Diffraction
Microscopist (b) (6
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

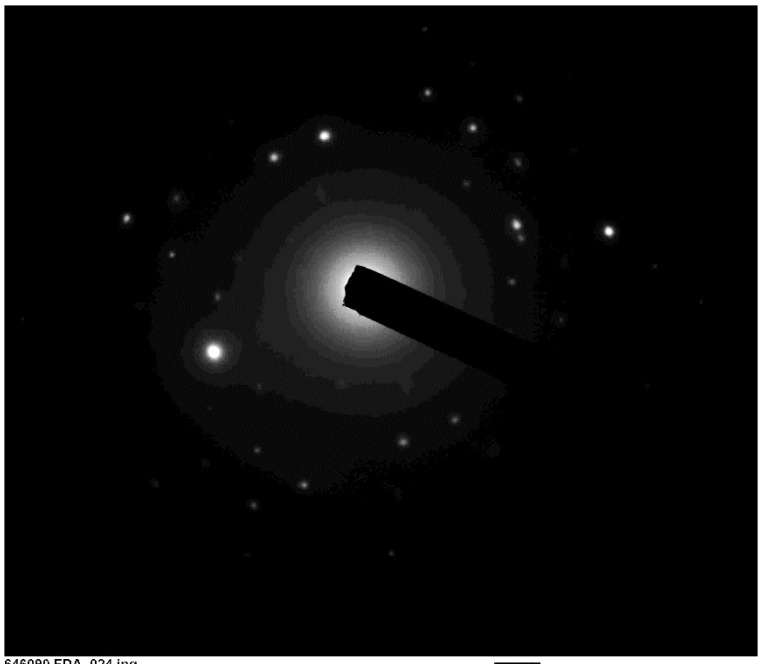
Chemistry from the Iron Particles Pictured Above



646090-3A, Elongated Iron Particle



Diffraction Pattern from the Elongated Iron Particle Pictured Above

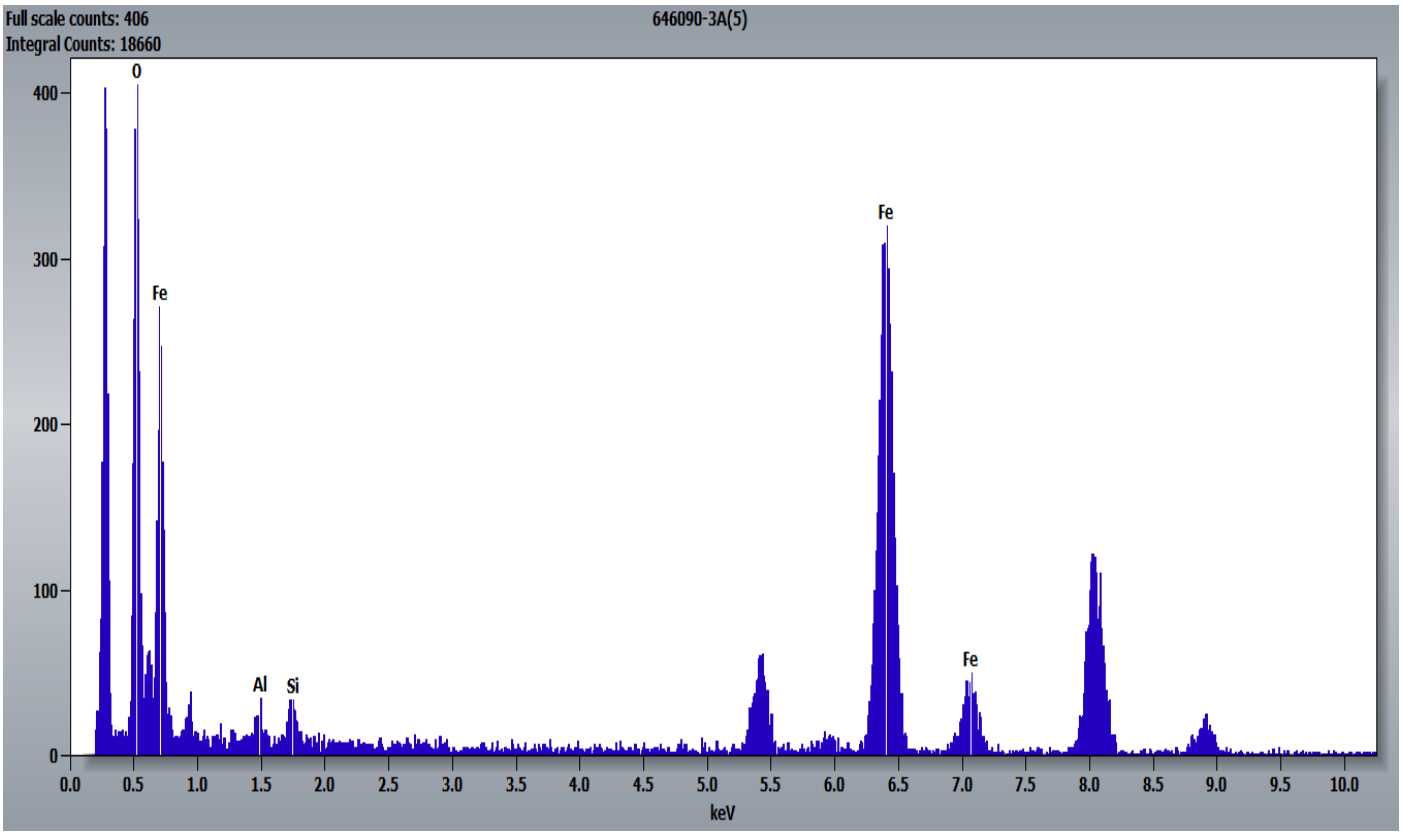


646090 FDA_024.jpg
646090-3A
Fe Fiber

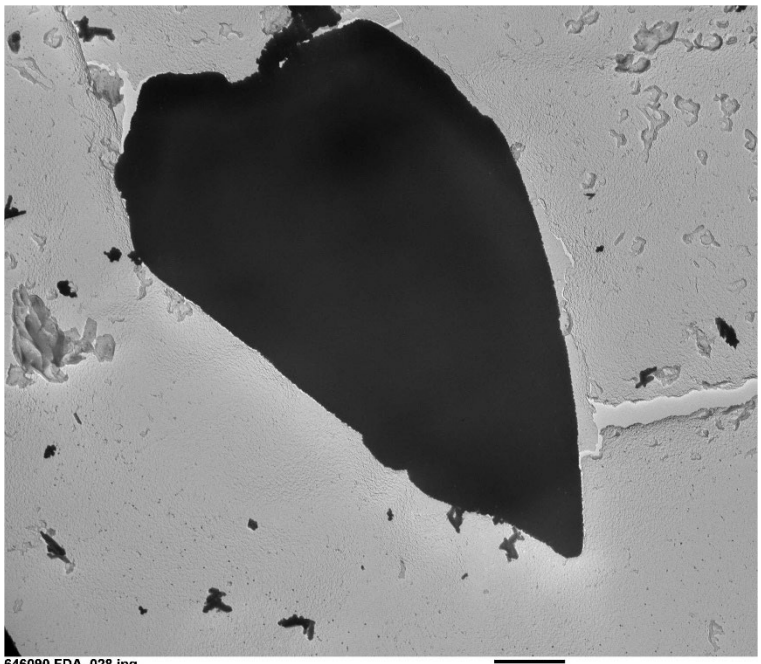
Cal: 0.000955 µm/pix
15:49 2023-06-05
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Elongated Iron Particles Pictured Above



646090-3A, Mica Particle with Iron and Titanium

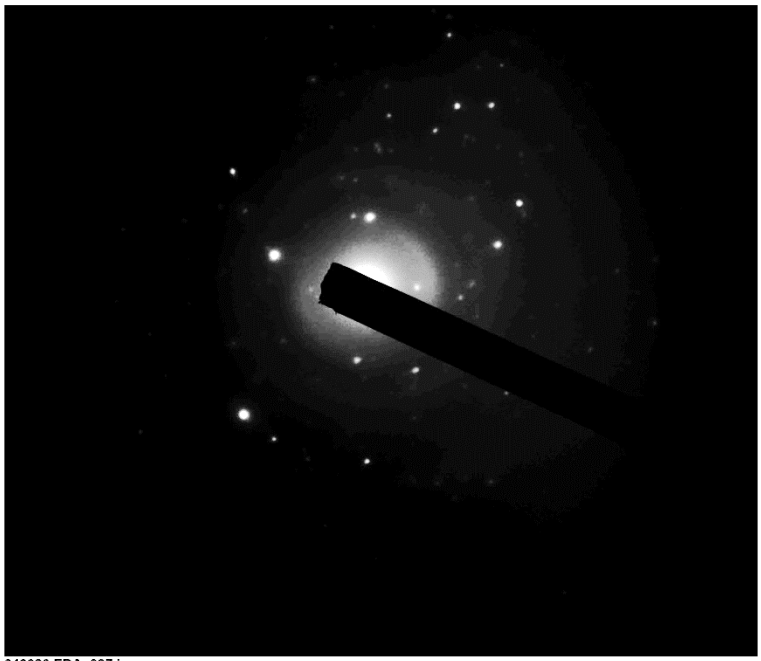


646090 FDA_028.jpg
646090-3A
Mica w/ Ti, Fe

Cal: 0.007956 µm/pix
15:56 2023-06-05
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: 1200 x

Diffraction Pattern from the Mica Particle with Iron and Titanium Pictured Above

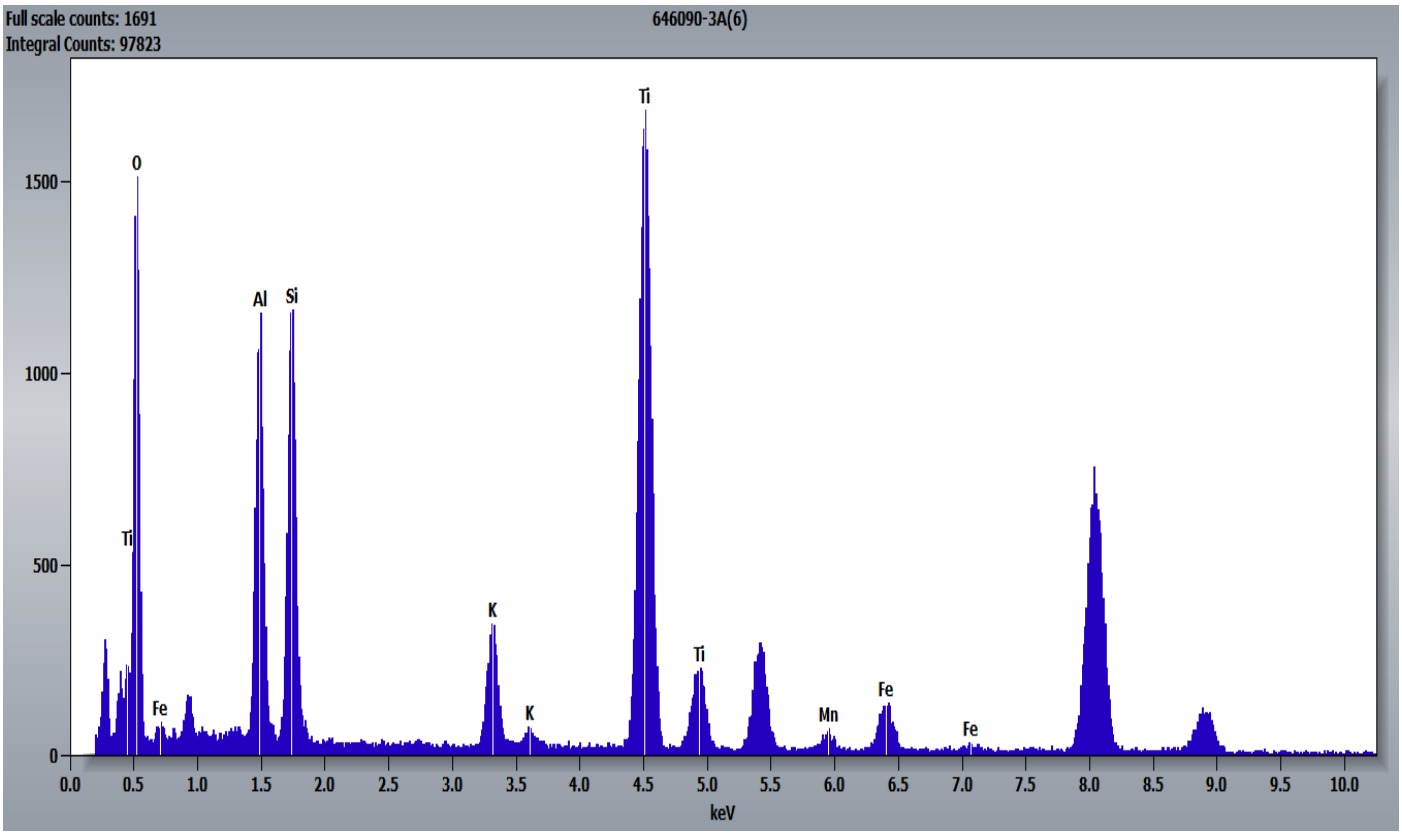


646090 FDA_027.jpg
646090-3A
Mica w/ Ti, Fe

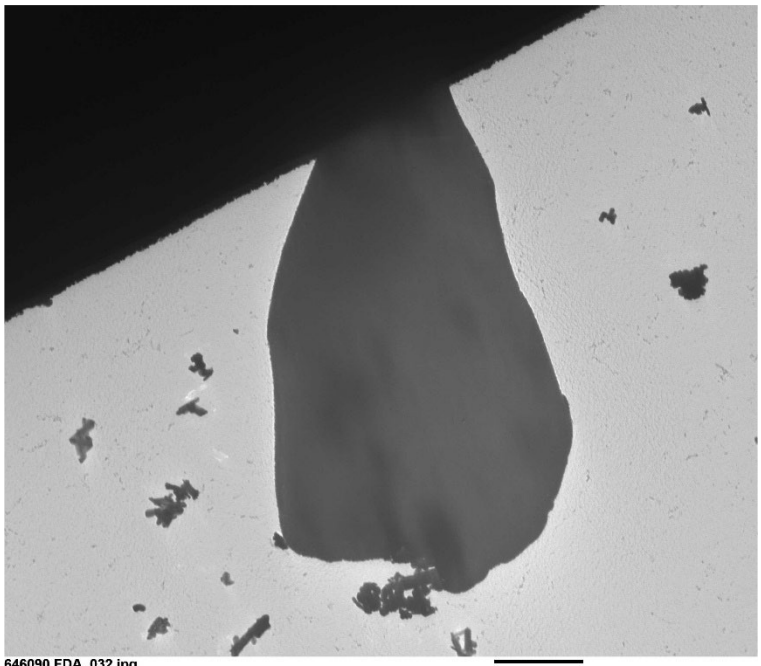
Cal: 0.000817 µm/pix
15:55 2023-06-05
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

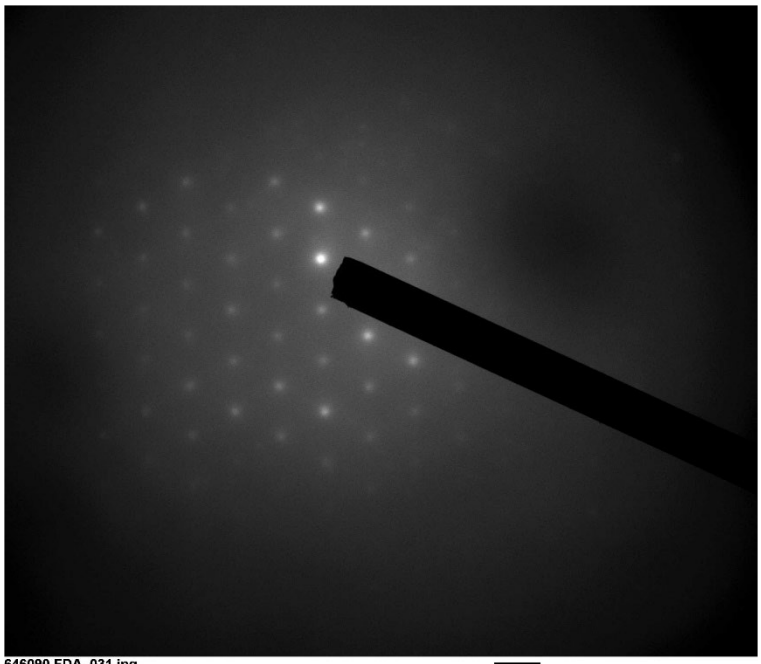
Chemistry from the Mica Particle with Iron and Titanium Pictured Above



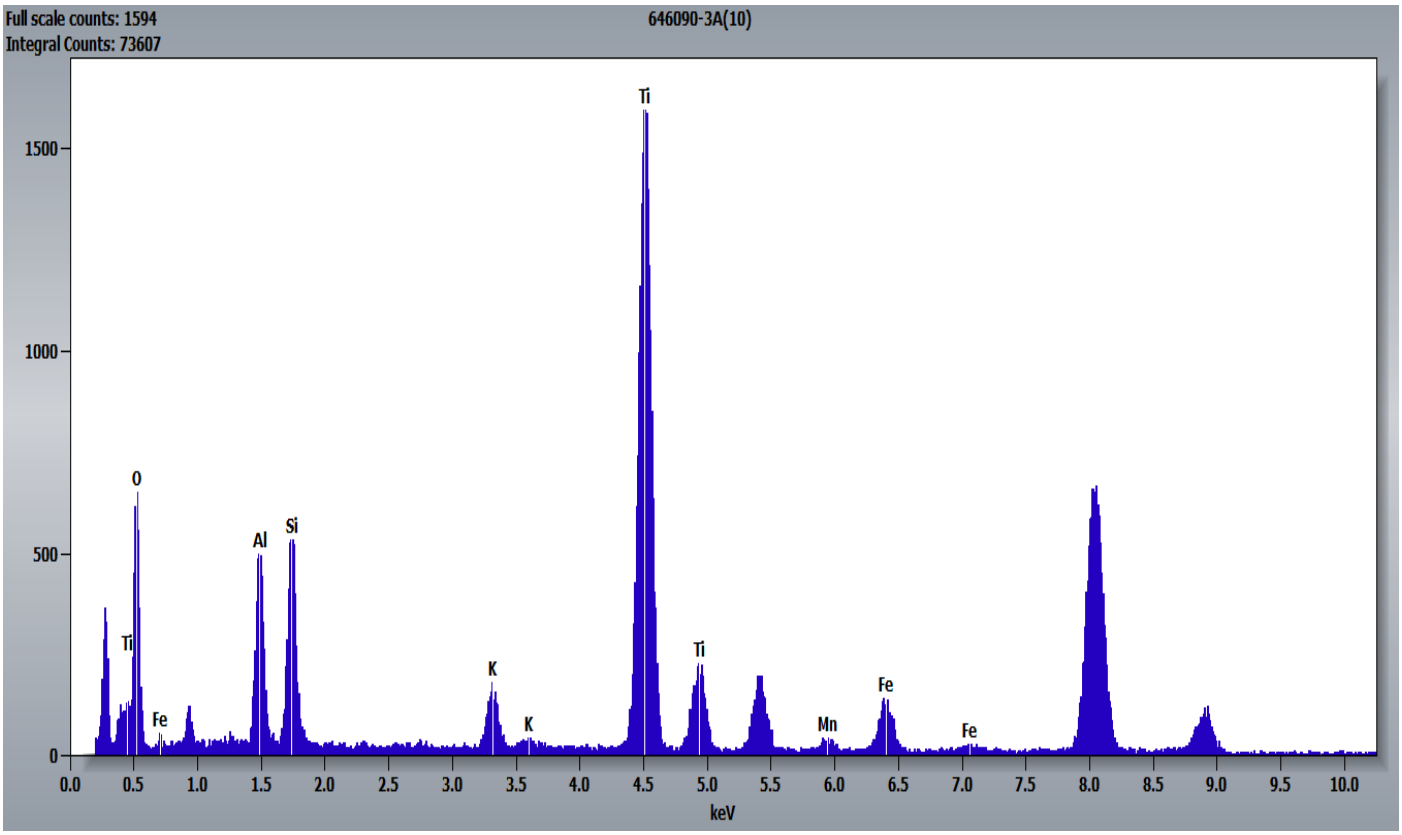
646090-3A, Mica Particle with Iron and Titanium



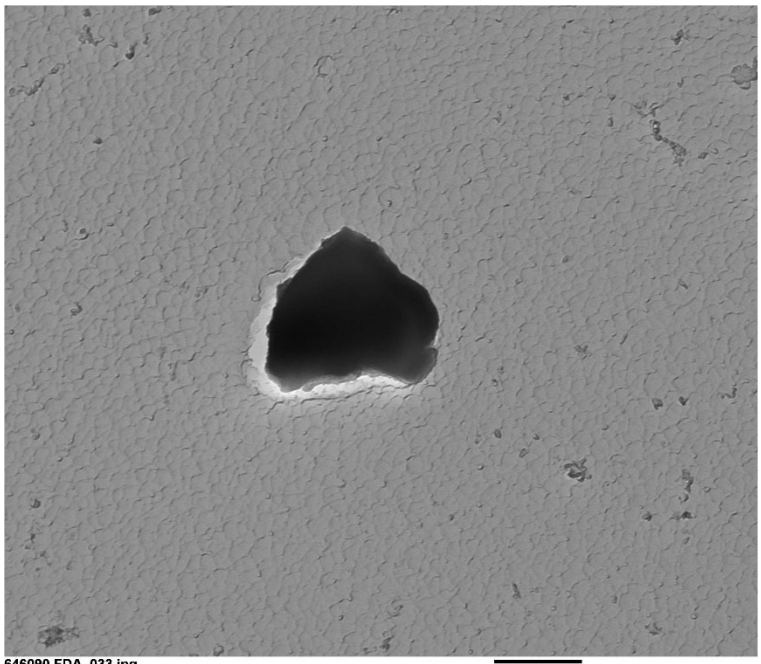
Hexagonal Diffraction Pattern from the Mica Particle with Iron and Titanium Pictured Above



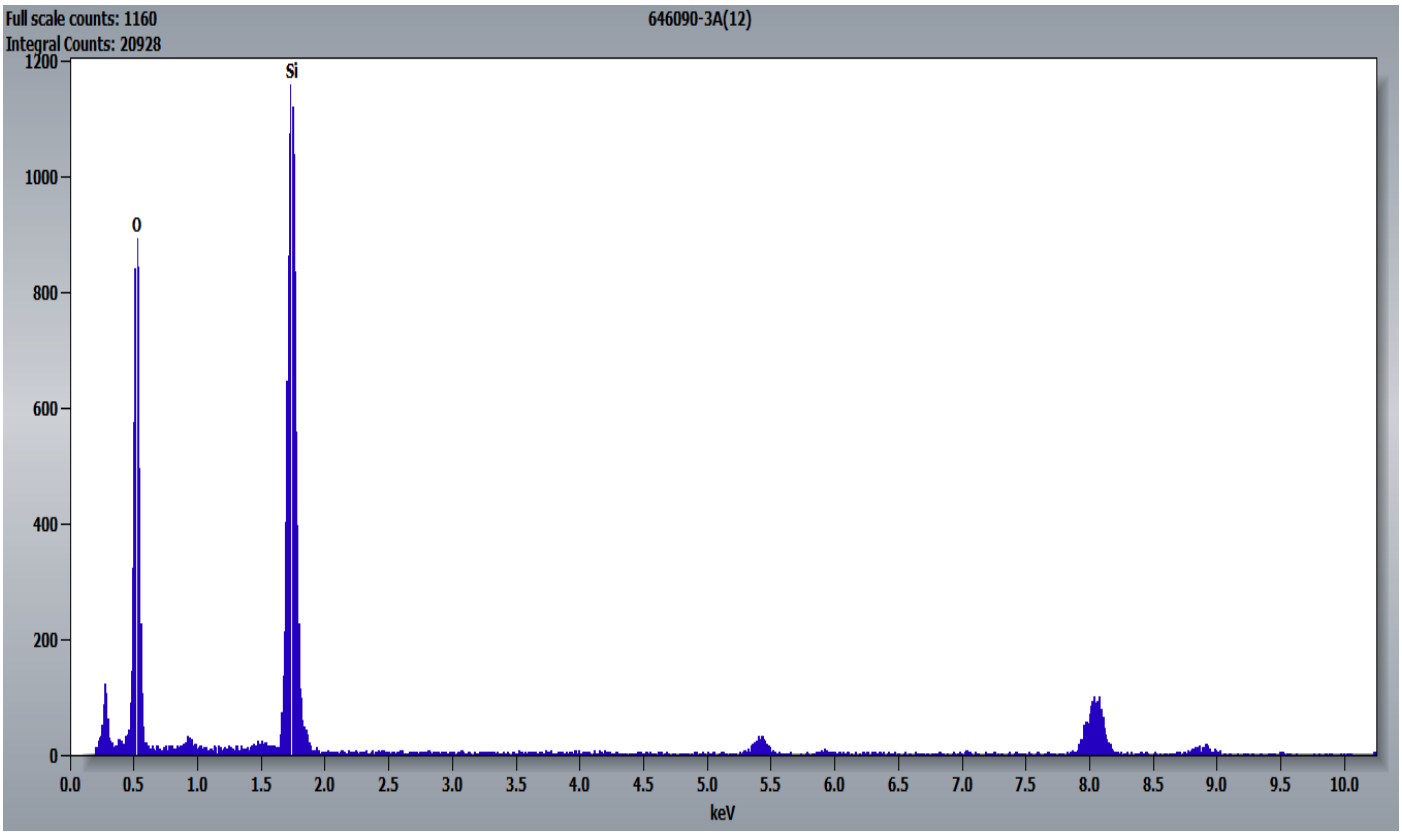
Chemistry from the Mica Particle with Iron and Titanium Pictured Above



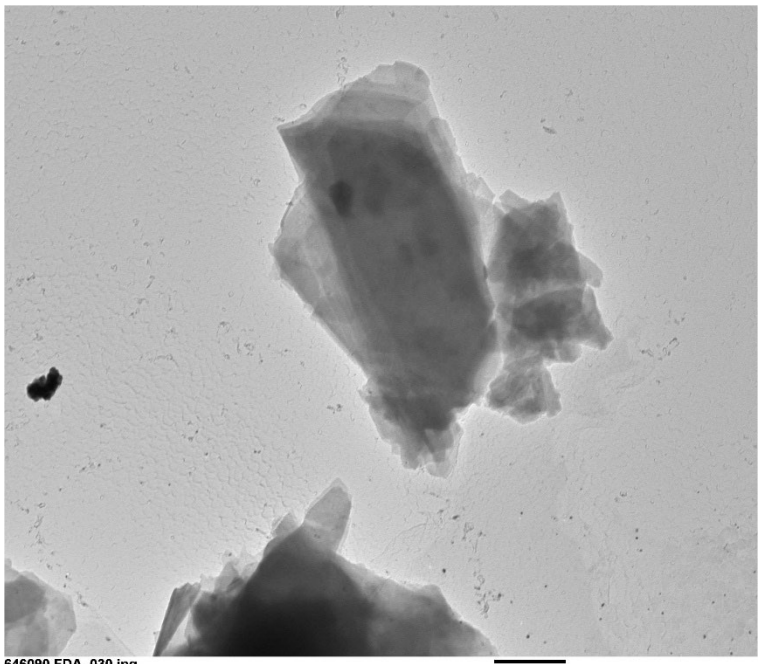
646090-3A, Silicon Particle



Chemistry from the Silicon Particle Pictured Above



646090-3A, Talc Particle

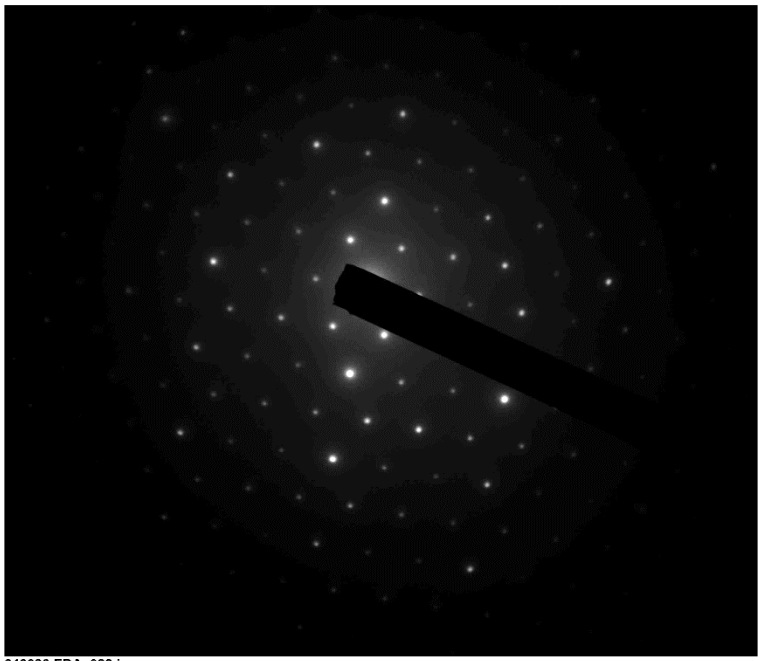


646090 FDA_030.jpg
646090-3A
Talc Particle

Cal: 0.002387 µm/pix
16:07 2023-06-05
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

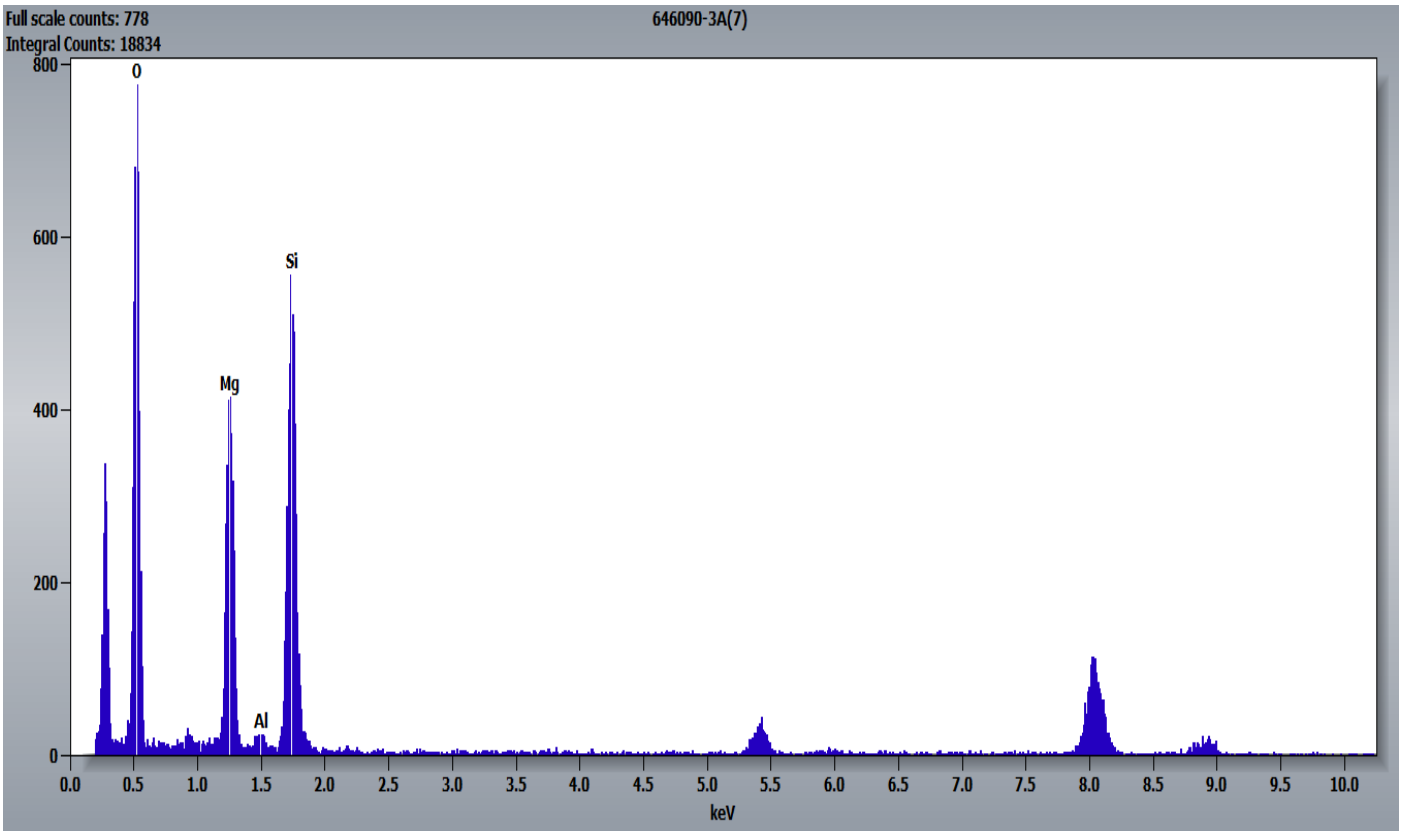


646090 FDA_029.jpg
646090-3A
Talc Particle

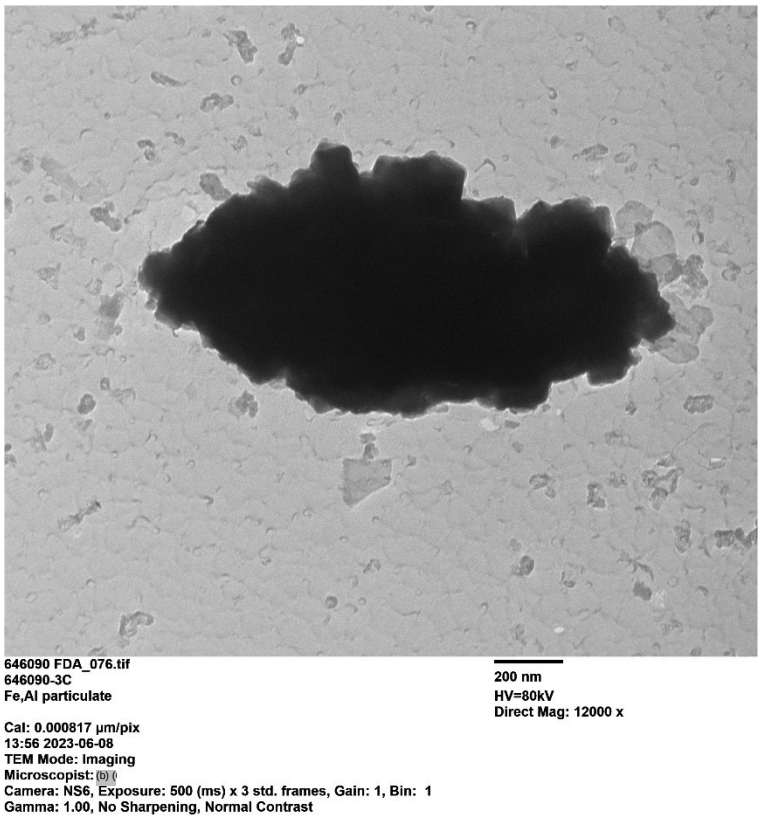
Cal: 0.007956 µm/pix
16:06 2023-06-05
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

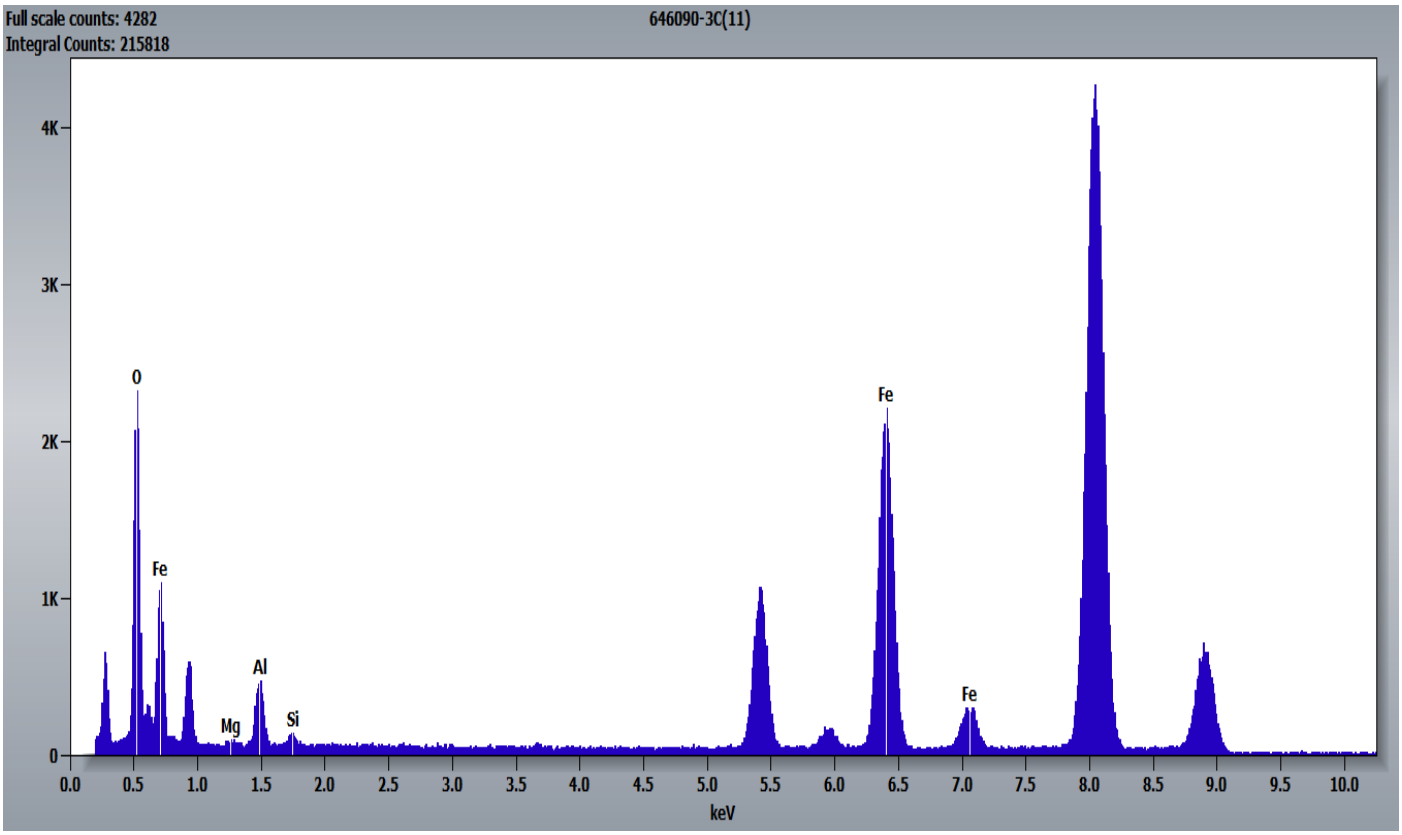
Chemistry from the Talc Particle Pictured Above



646090-3C, Particle Containing Aluminum and Iron



Chemistry from the Particle Containing Aluminum and Iron Pictured Above



646090-4A, 4B, 4C/Client Sample: 04032023-4

PLM

All three aliquots of sample 04032023-4 were analyzed by (b) (6) on June 9, 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.

646090-4A	No Asbestos Detected
646090-4B	No Asbestos Detected
646090-4C	No Asbestos Detected

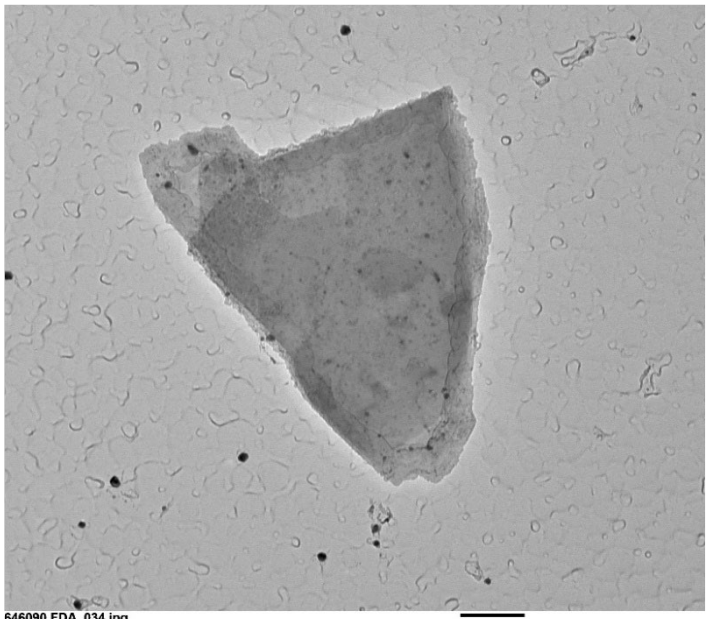
TEM

(b) (6) analyzed aliquot 4A on June 7, 2023. (b) (6) analyzed aliquot 4B on June 7, 2023, and (b) (6) analyzed aliquot 4C on June 8, 2023. The primary particle observed was talc; titanium and iron particles were also observed along with calcium particles, silicon particles, aluminum particles, talc ribbons/fibers, particles containing phosphorus and calcium, and particles containing magnesium, aluminum, silicon, and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

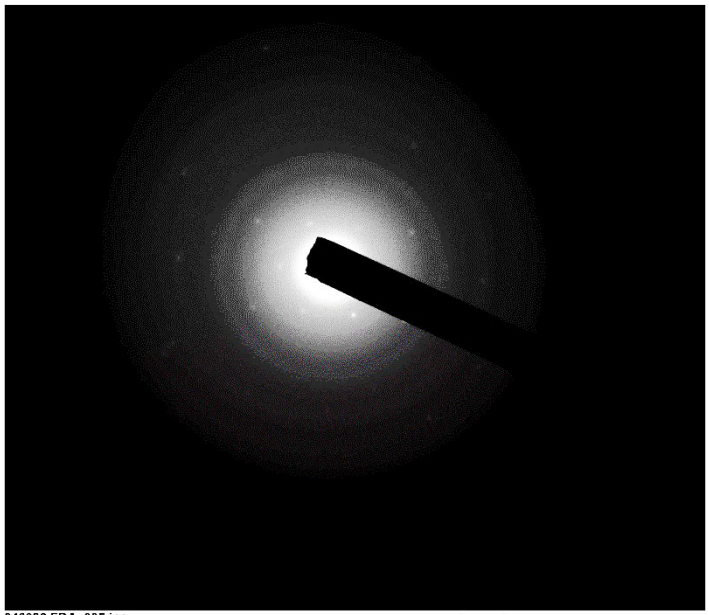
646090-4A	No Asbestos Detected
646090-4B	No Asbestos Detected
646090-4C	No Asbestos Detected

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.

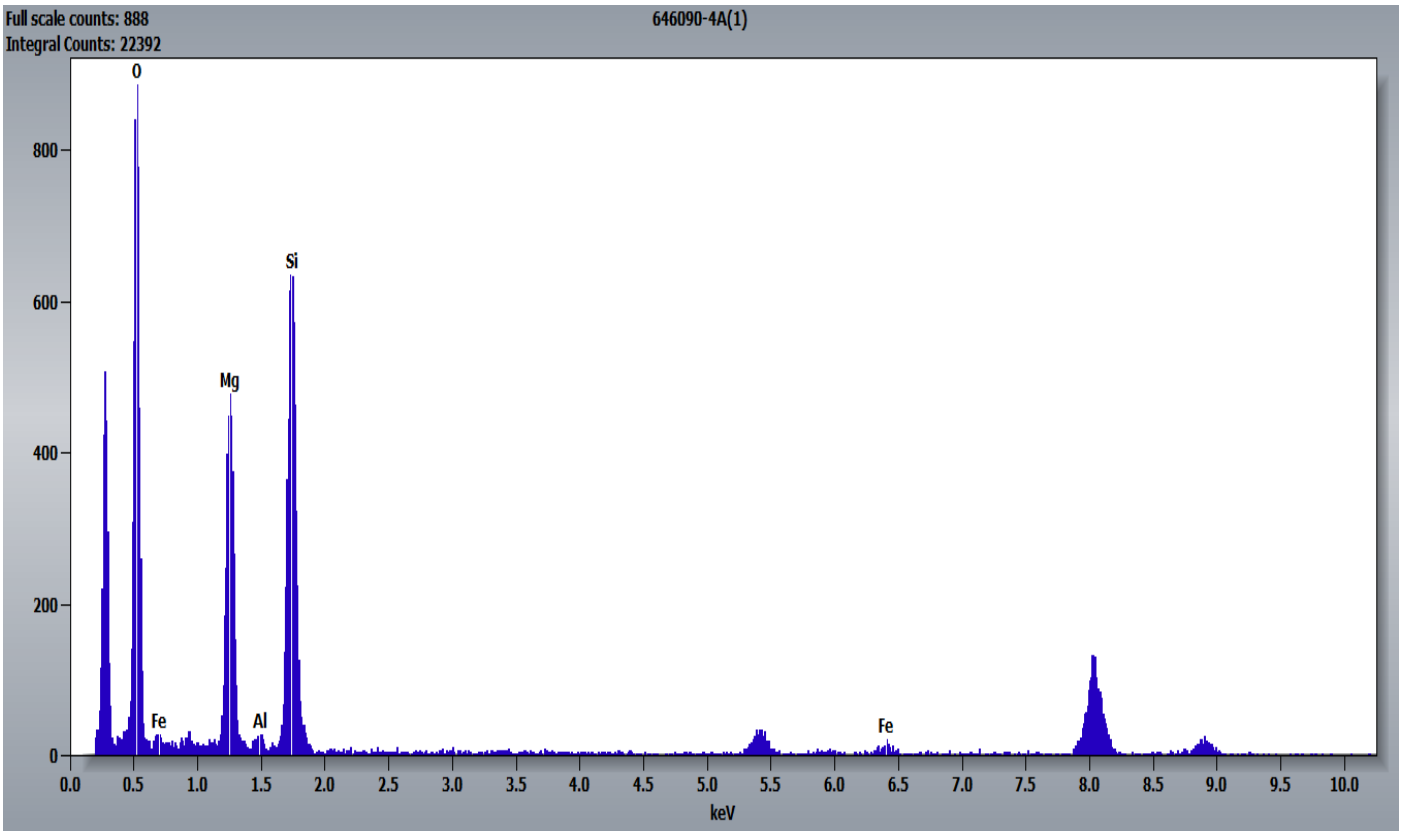
646090-4A, Talc Particle



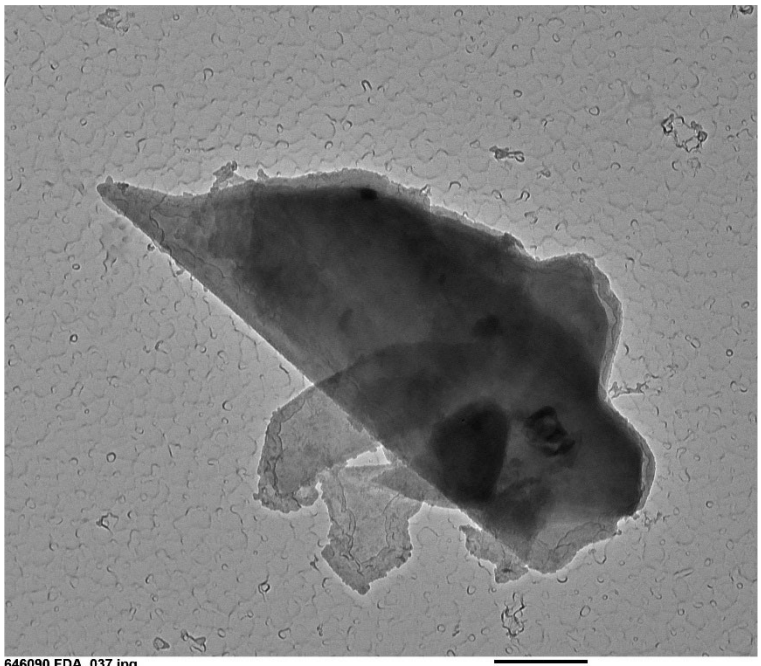
Diffraction Pattern from the Talc Particle Pictured Above



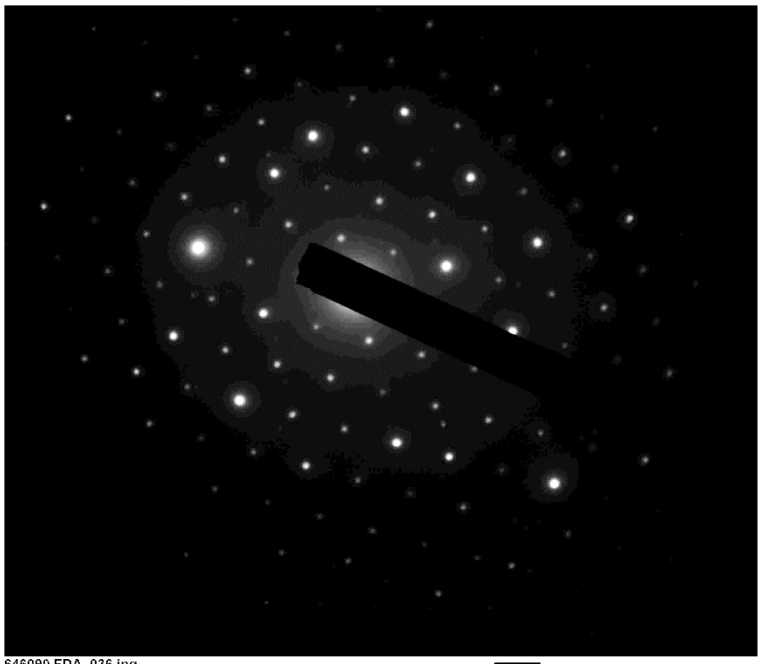
Chemistry from the Talc Particle Pictured Above



646090-4A, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

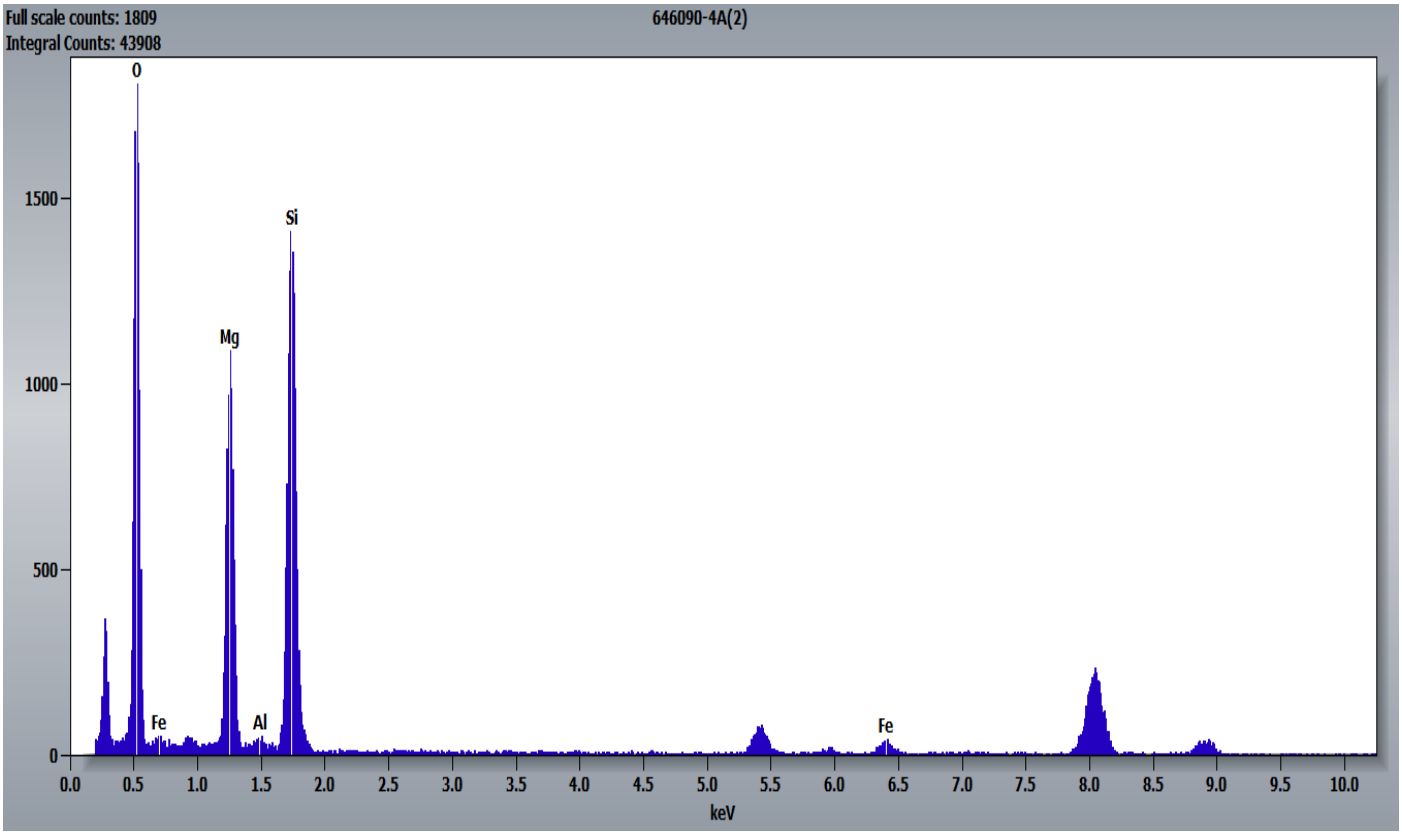


646090 FDA_036.jpg
646090-4A
Talc

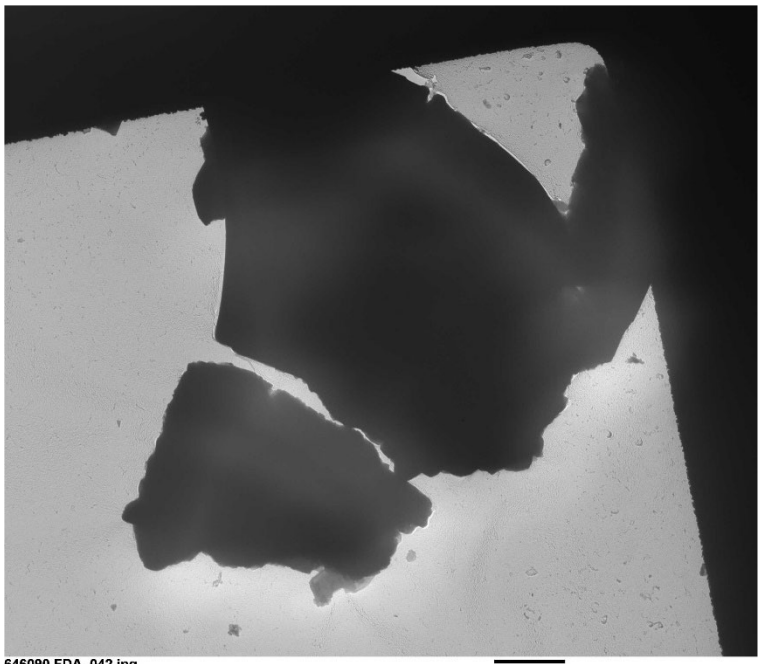
Cal: 0.000817 µm/pix
10:01 2023-06-07
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle Pictured Above



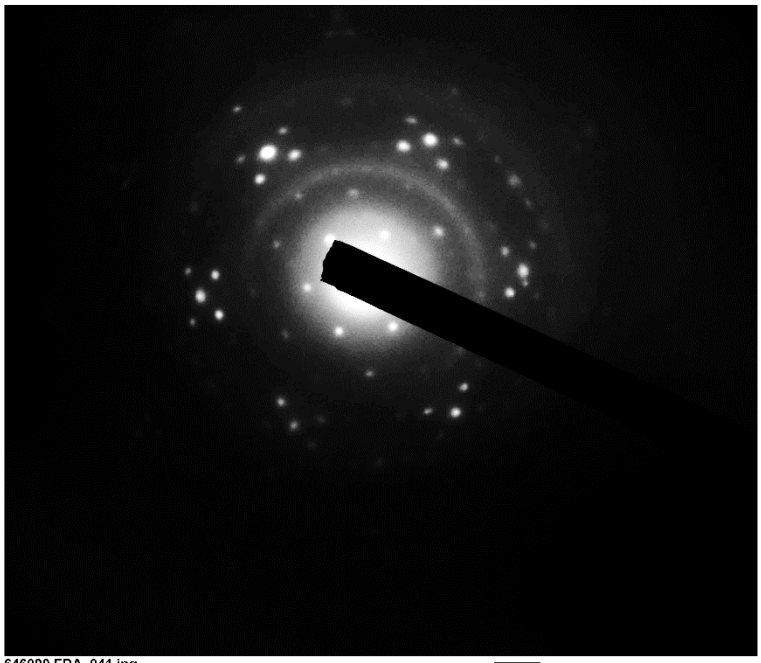
646090-4A, Talc Particle



646090 FDA_042.jpg
646090-4A
Talc
Dense particles
Cal: 0.015913 µm/pix
10:19 2023-06-07
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

4 µm
HV=80kV
Direct Mag: 600 x

Diffraction Pattern from the Talc Particle Pictured Above

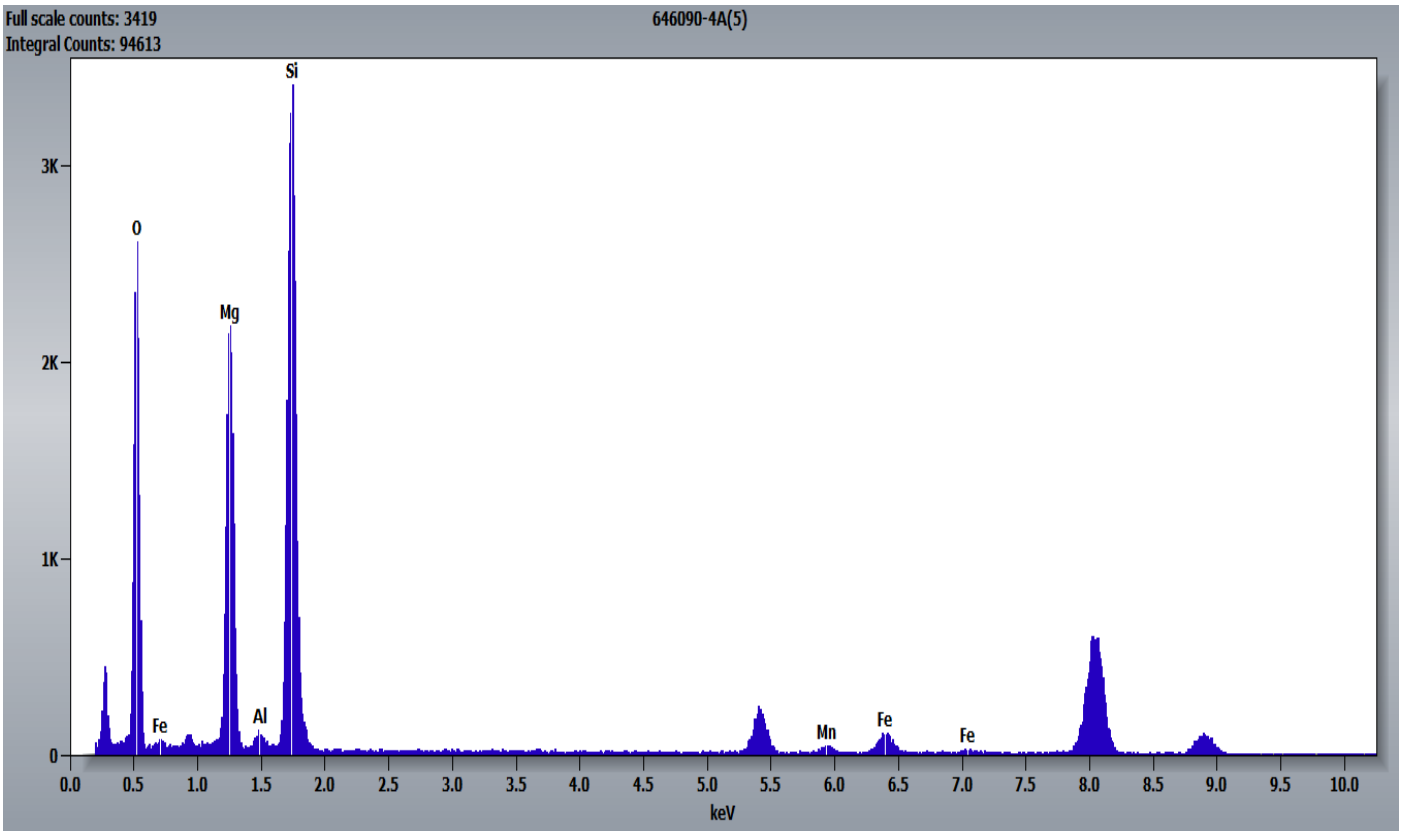


646090 FDA_041.jpg
646090-4A
Talc

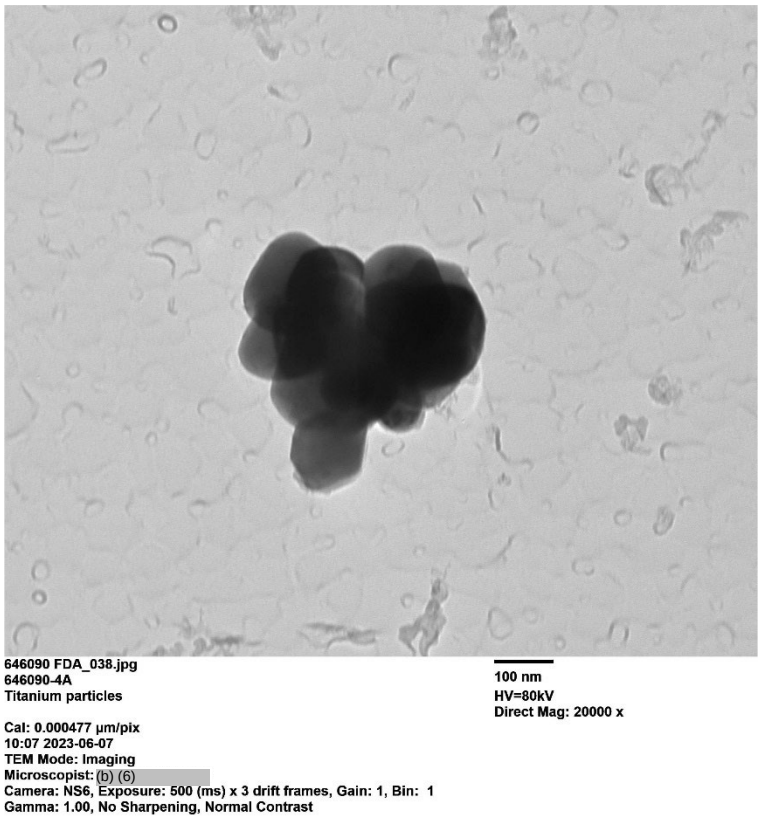
Cal: 0.000477 µm/pix
10:16 2023-06-07
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

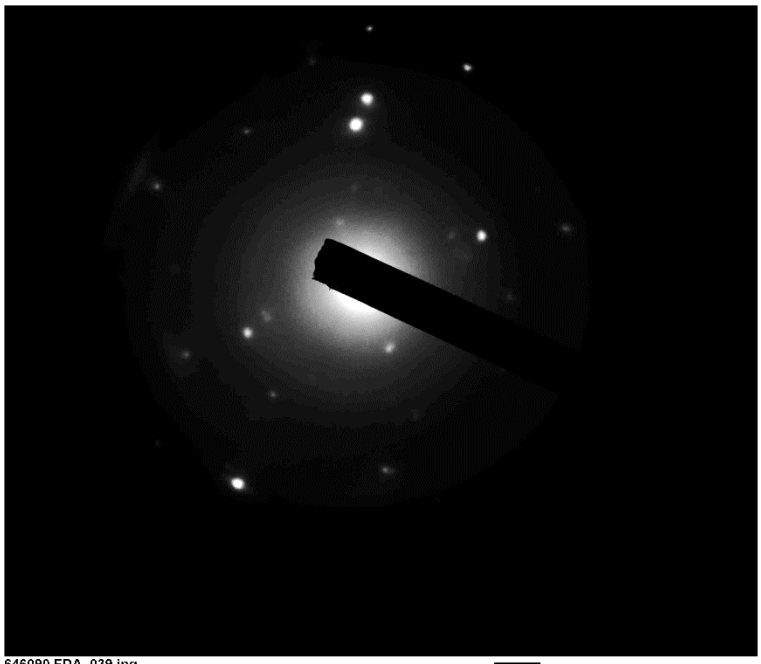
Chemistry from the Talc Particle Pictured Above



646090-4A, Titanium Particles



Diffraction Pattern from the Titanium Particles Pictured Above

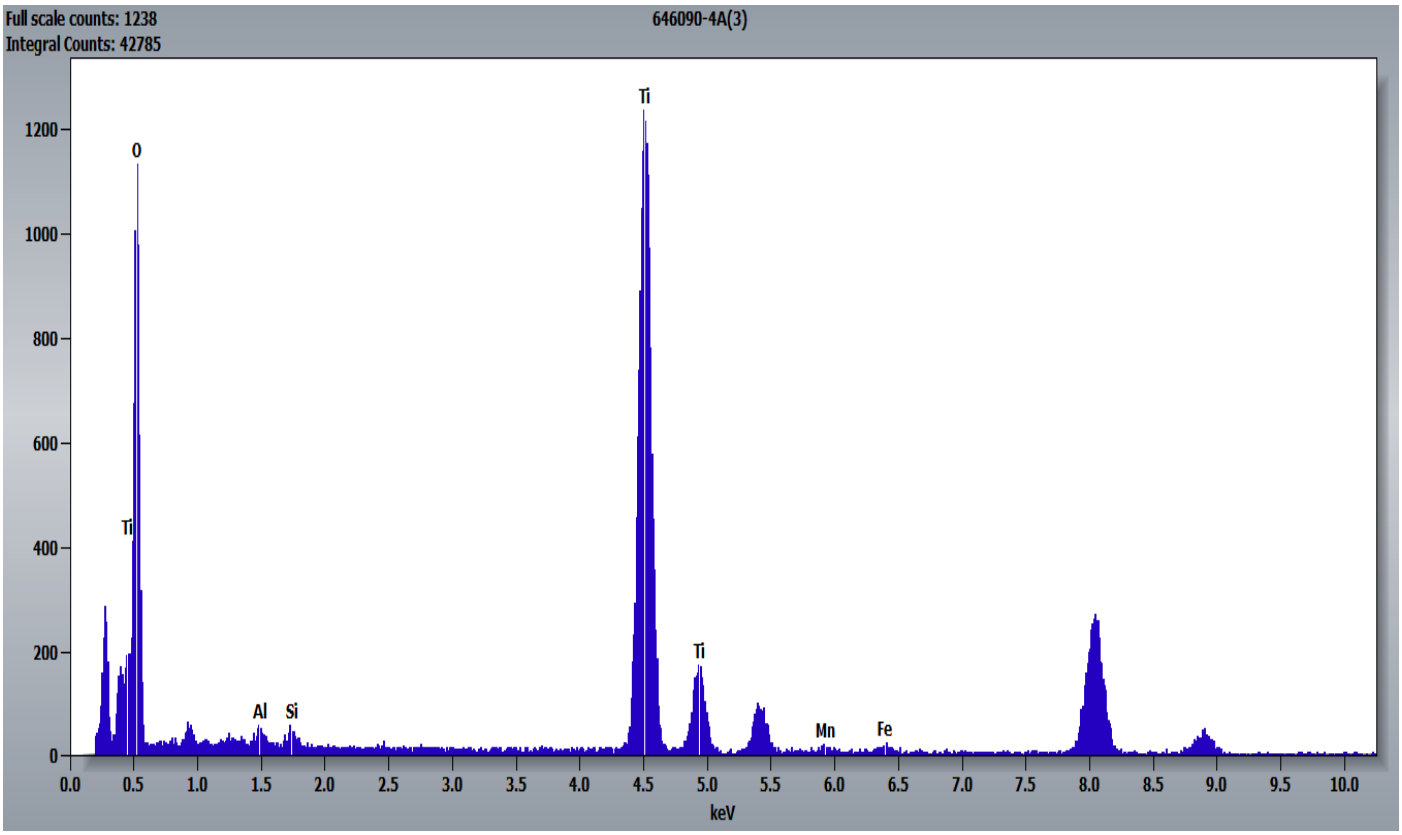


646090 FDA_039.jpg
646090-4A
Titanium particles

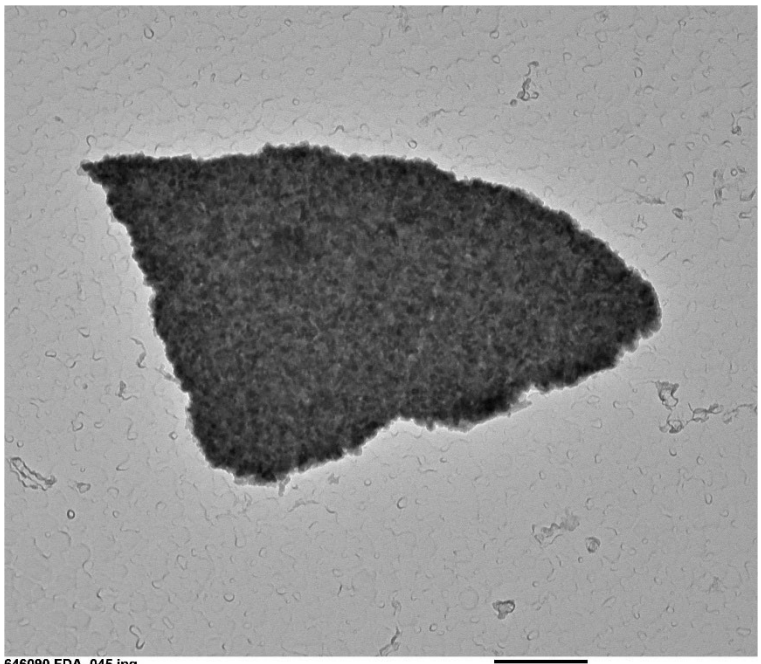
Cal: 0.000477 µm/pix
10:08 2023-06-07
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Titanium Particles Pictured Above



646090-4A, Titanium Particle

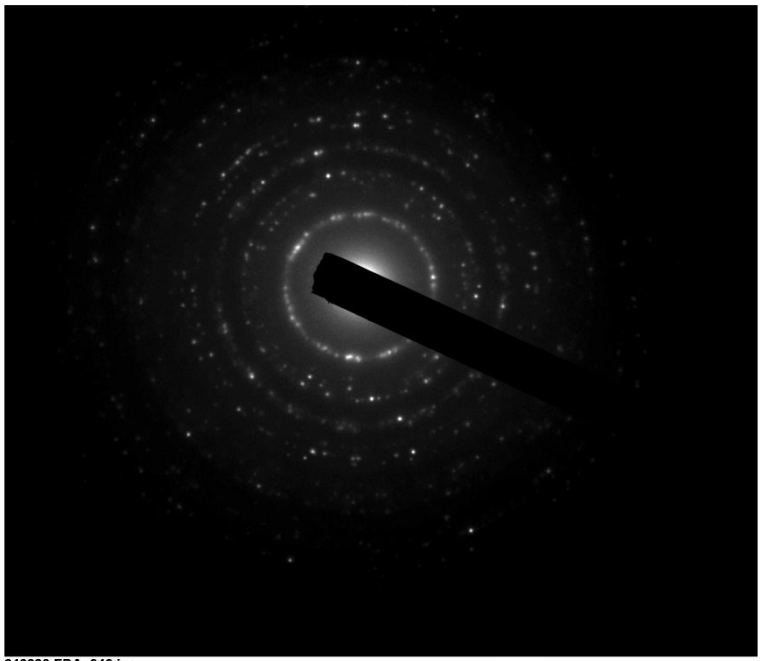


646090 FDA_045.jpg
646090-4A
Titanium particles

Cal: 0.001209 µm/pix
10:30 2023-06-07
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 Titanium Particle Pictured Above

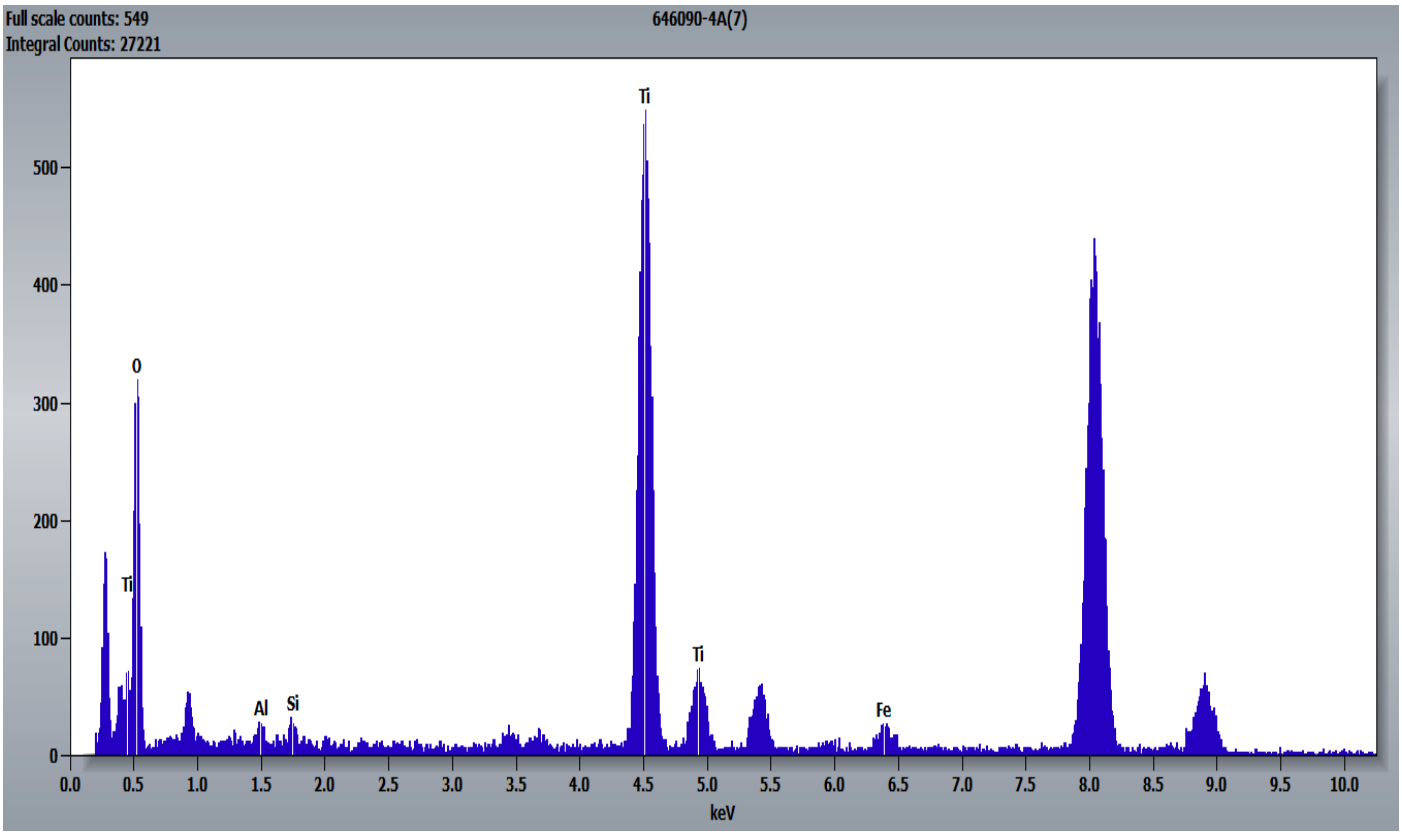


646090 FDA_046.jpg
646090-4A
Titanium particles

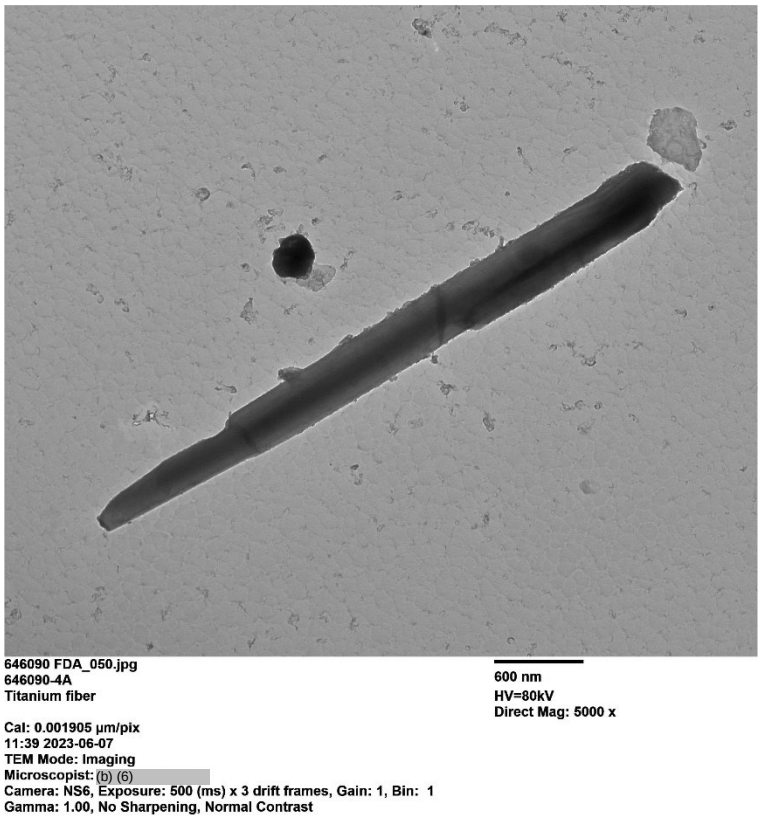
Cal: 0.001209 µm/pix
10:32 2023-06-07
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Titanium Particle Pictured Above

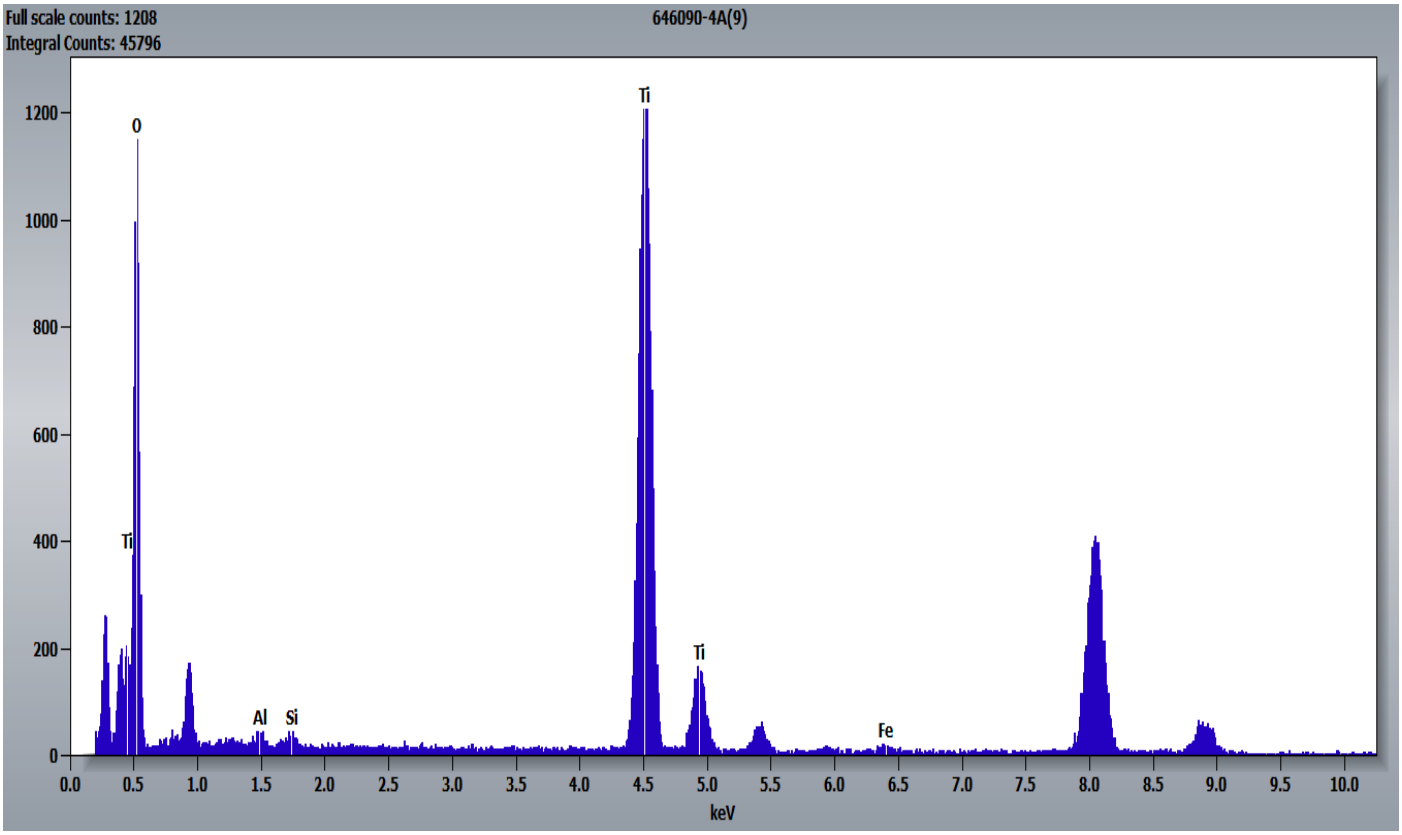


646090-4A, Elongated Titanium Particle

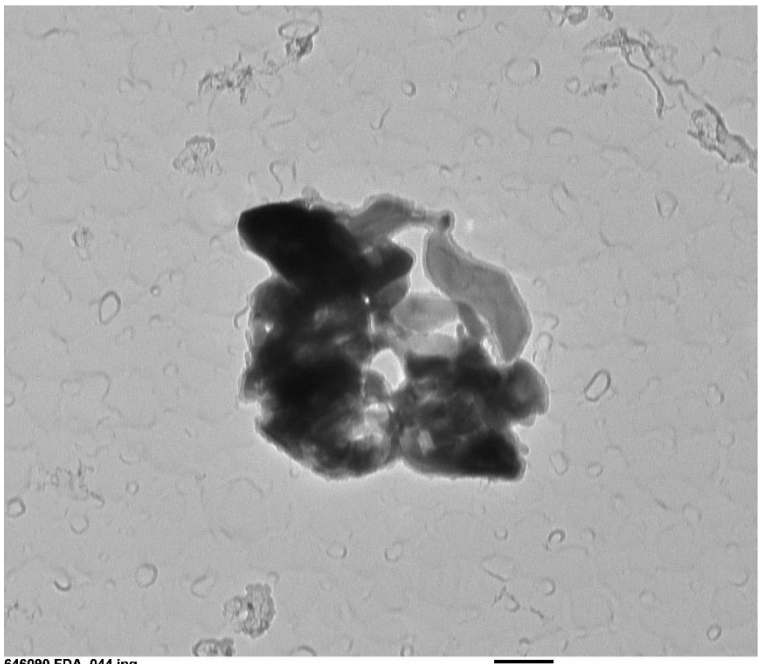


Diffraction Pattern from the Elongated Titanium Particle Pictured Above

Chemistry from the Elongated Titanium Particle Pictured Above



646090-4A, Iron Particles

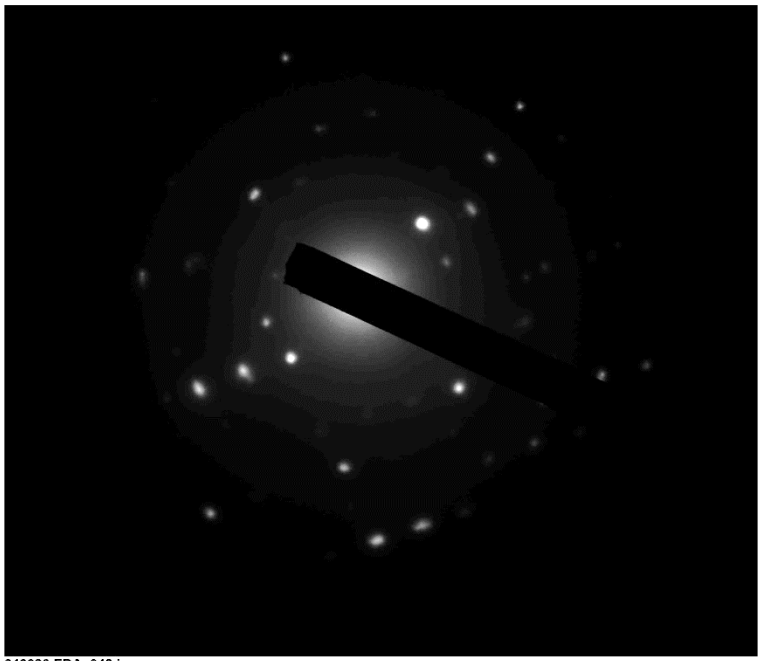


646090 FDA_044.jpg
646090-4A
Fe particles

Cal: 0.000477 µm/pix
10:24 2023-06-07
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

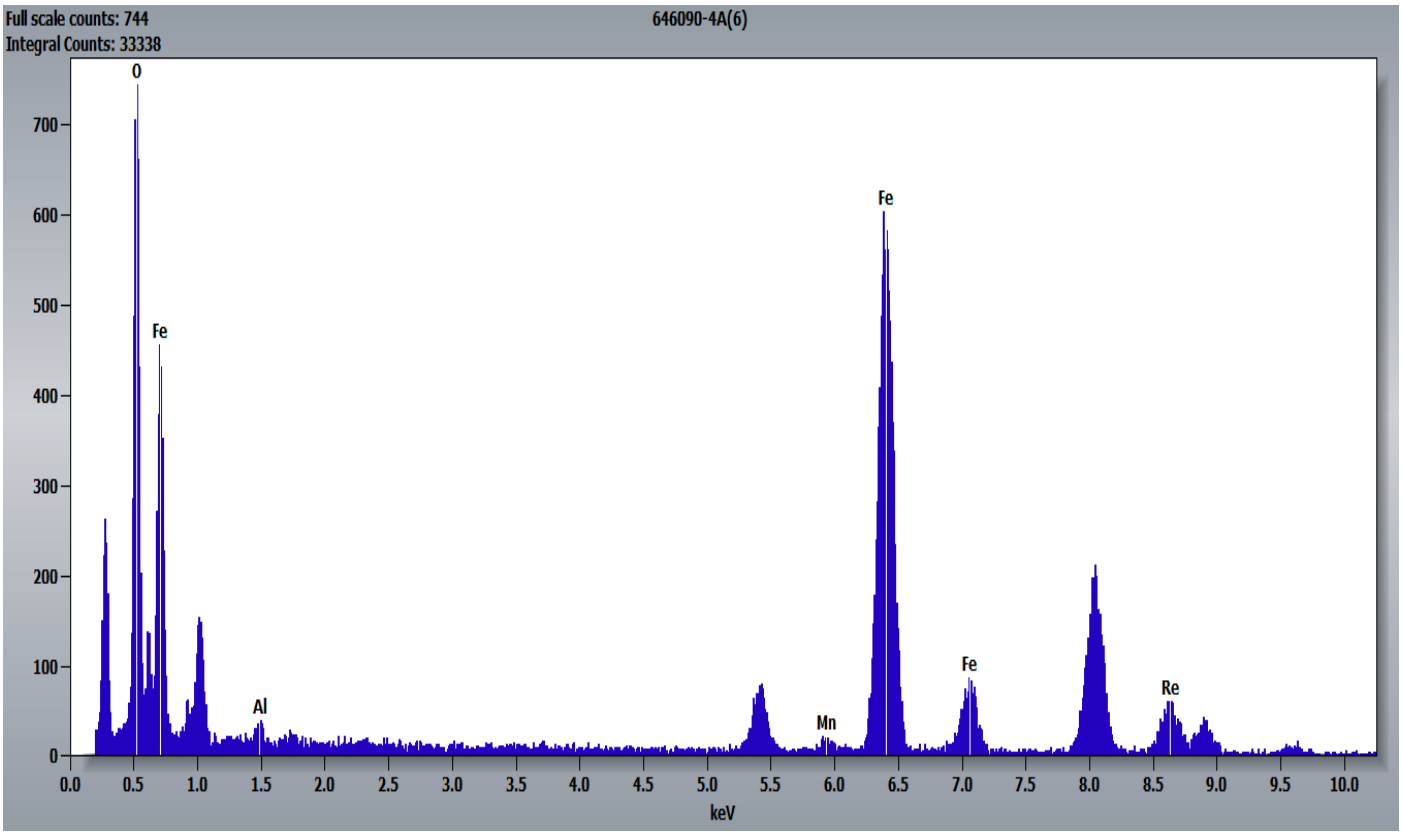


646090 FDA_043.jpg
646090-4A
Fe particles

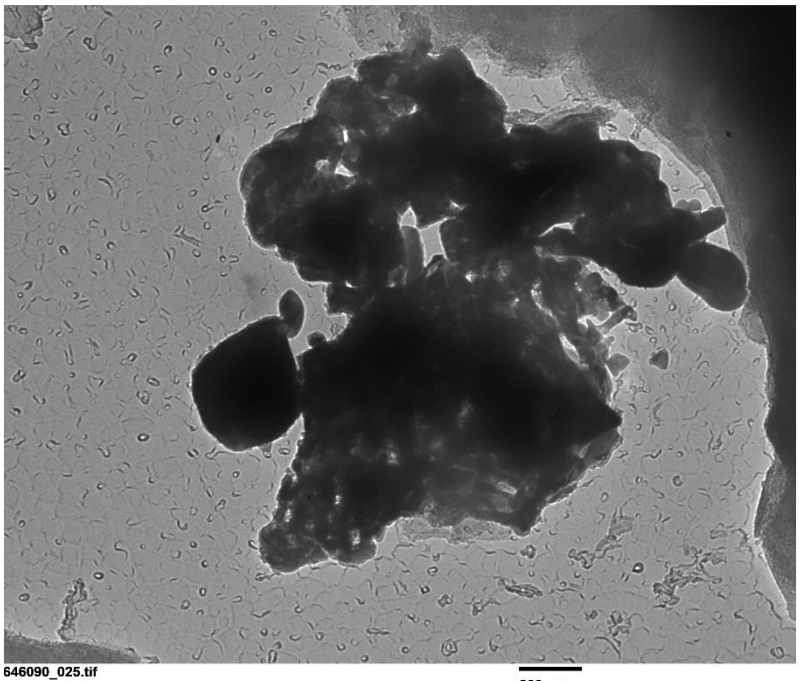
Cal: 0.015913 µm/pix
10:22 2023-06-07
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

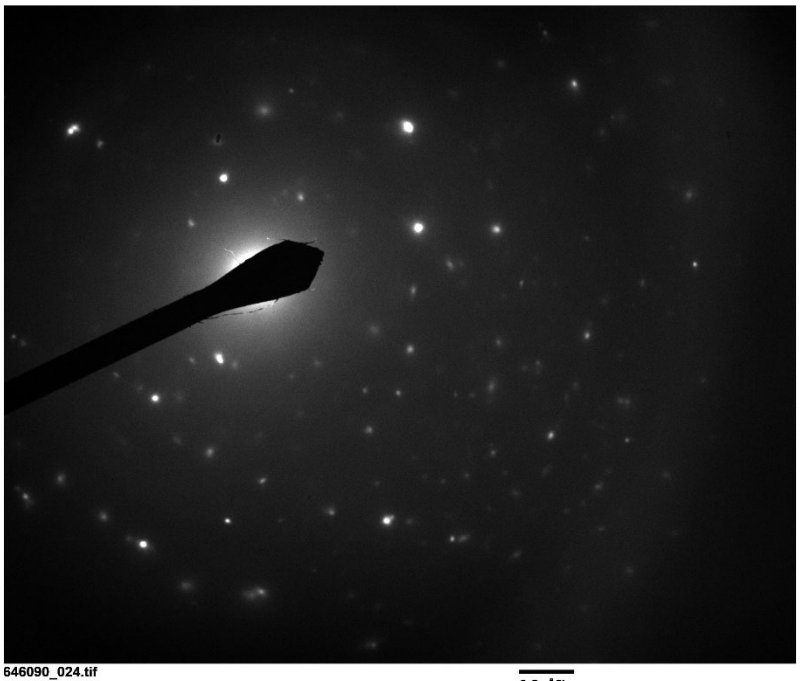
Chemistry from the Iron Particles Pictured Above



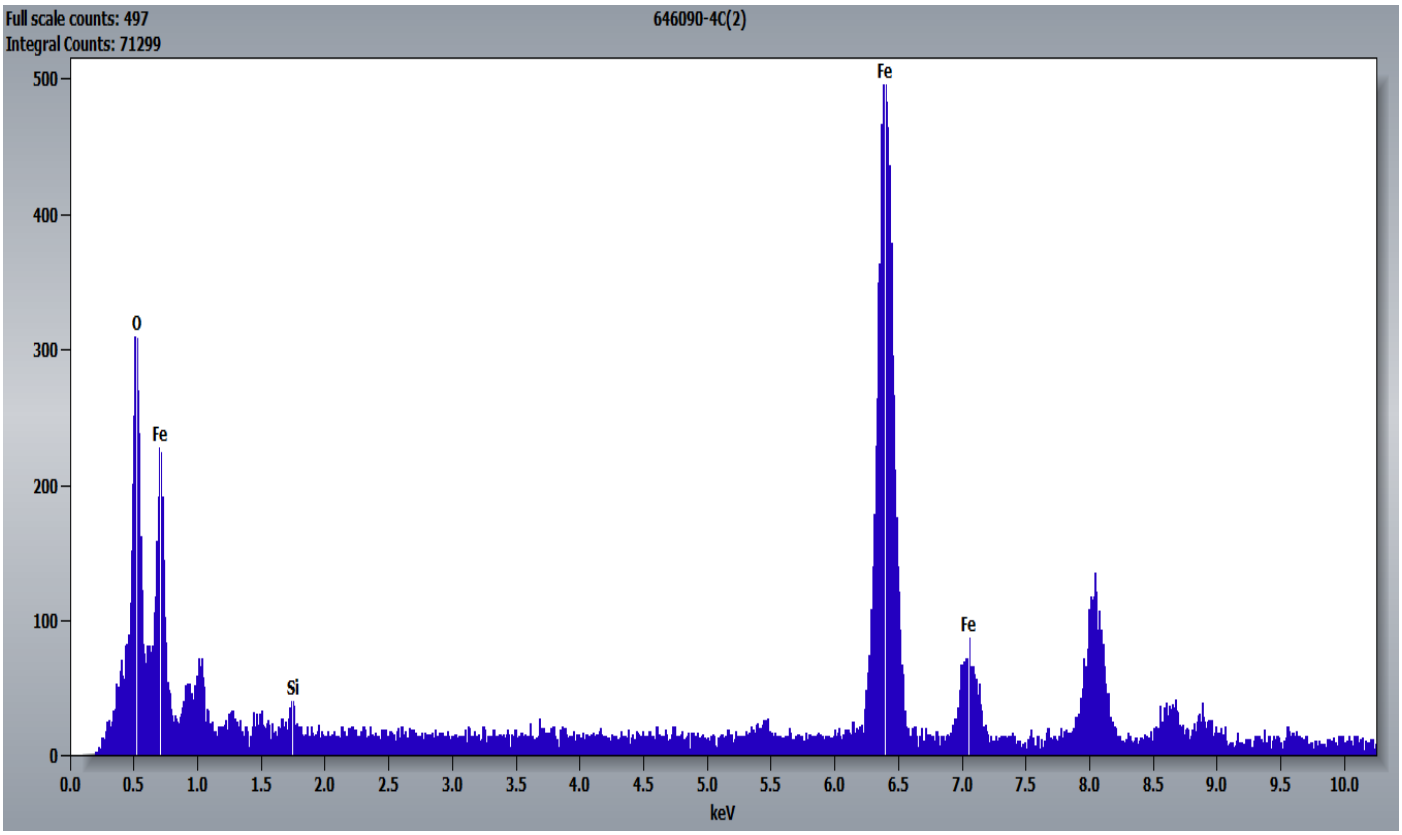
646090-4C, Iron Particles



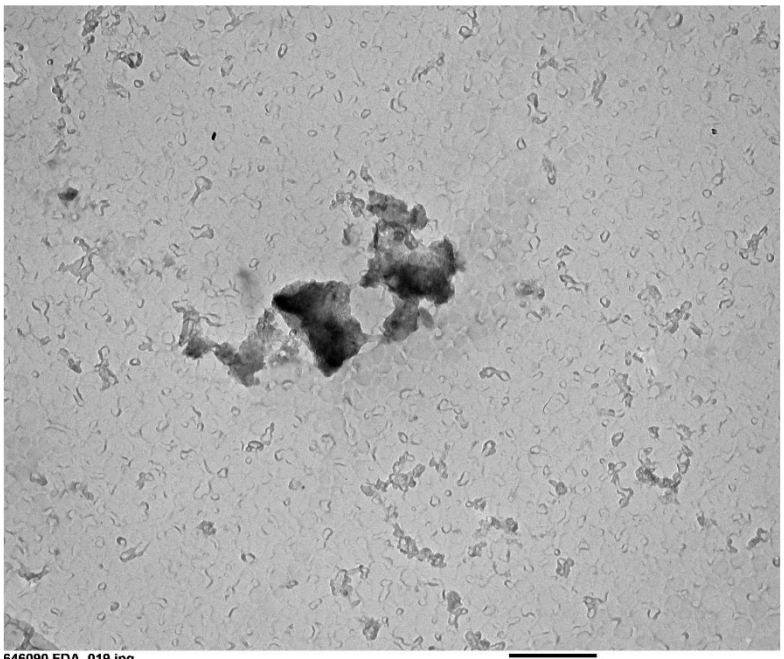
Diffraction Pattern from the Iron Particles Pictured Above



Chemistry from the Iron Particles Pictured Above



646090-4B, Calcium Particles

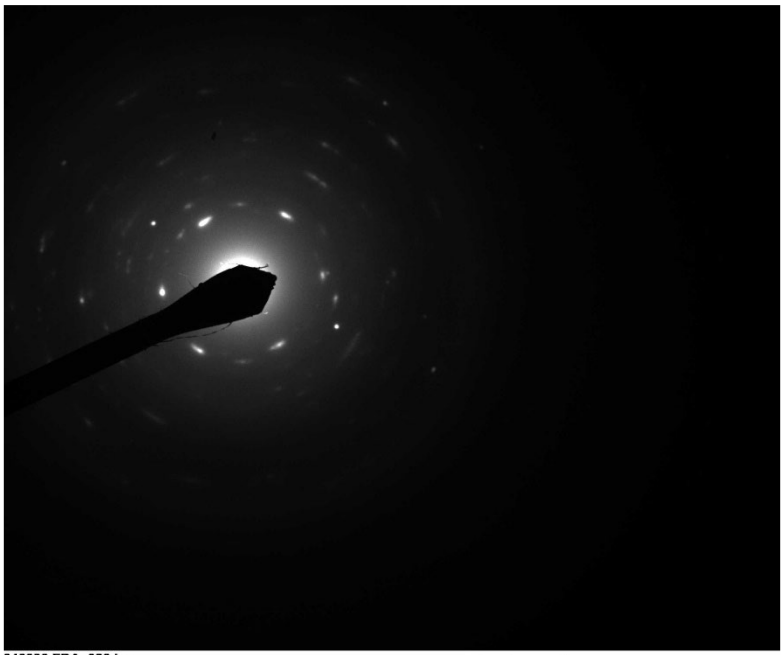


646090 FDA_019.jpg
646090-4B
Ca Particle

Cal: 0.001430 µm/pix
16:32 2023-06-07
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x

Diffraction Pattern from the Calcium Particles Pictured Above

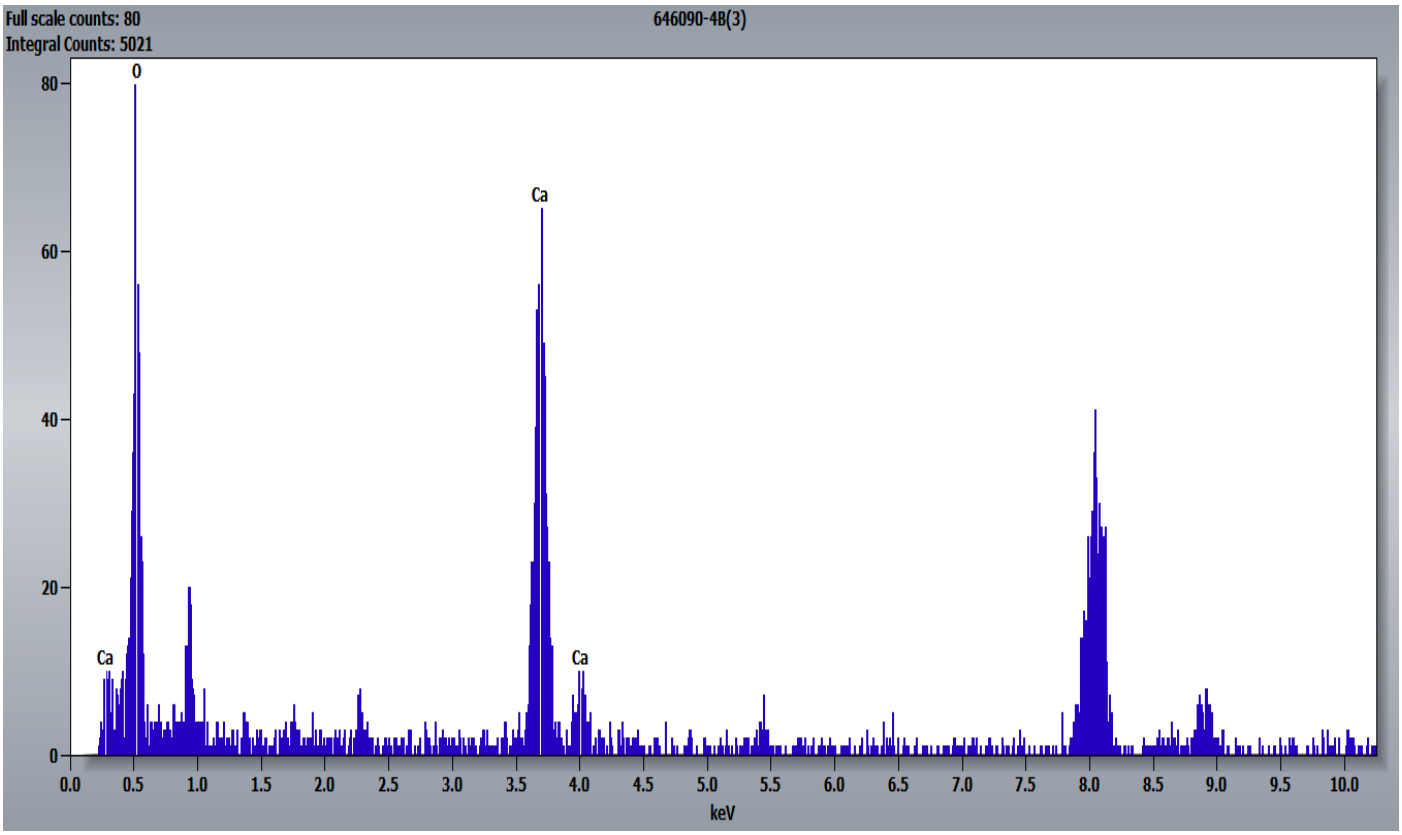


646090 FDA_020.jpg
646090-4B
Ca Particle

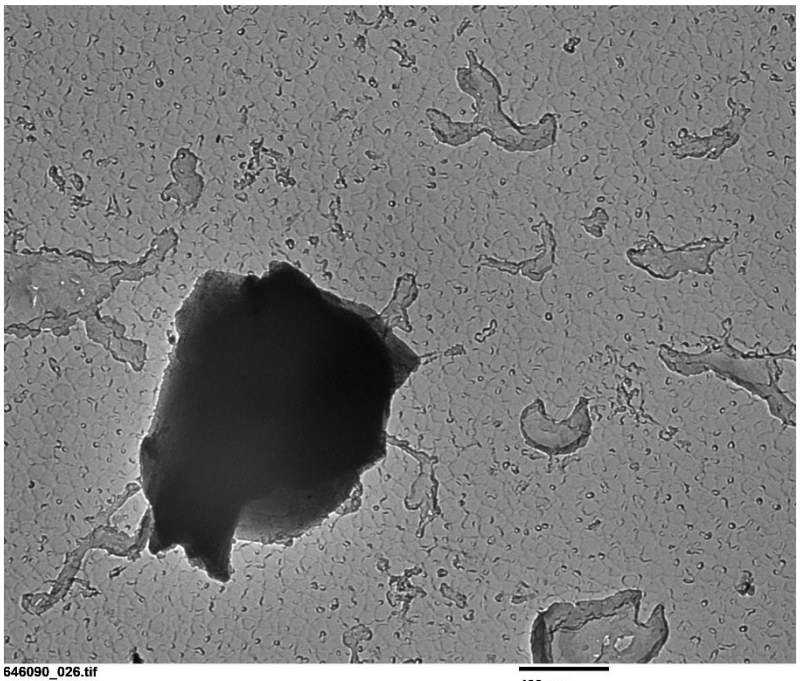
Cal: 0.001430 µm/pix
16:33 2023-06-07
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

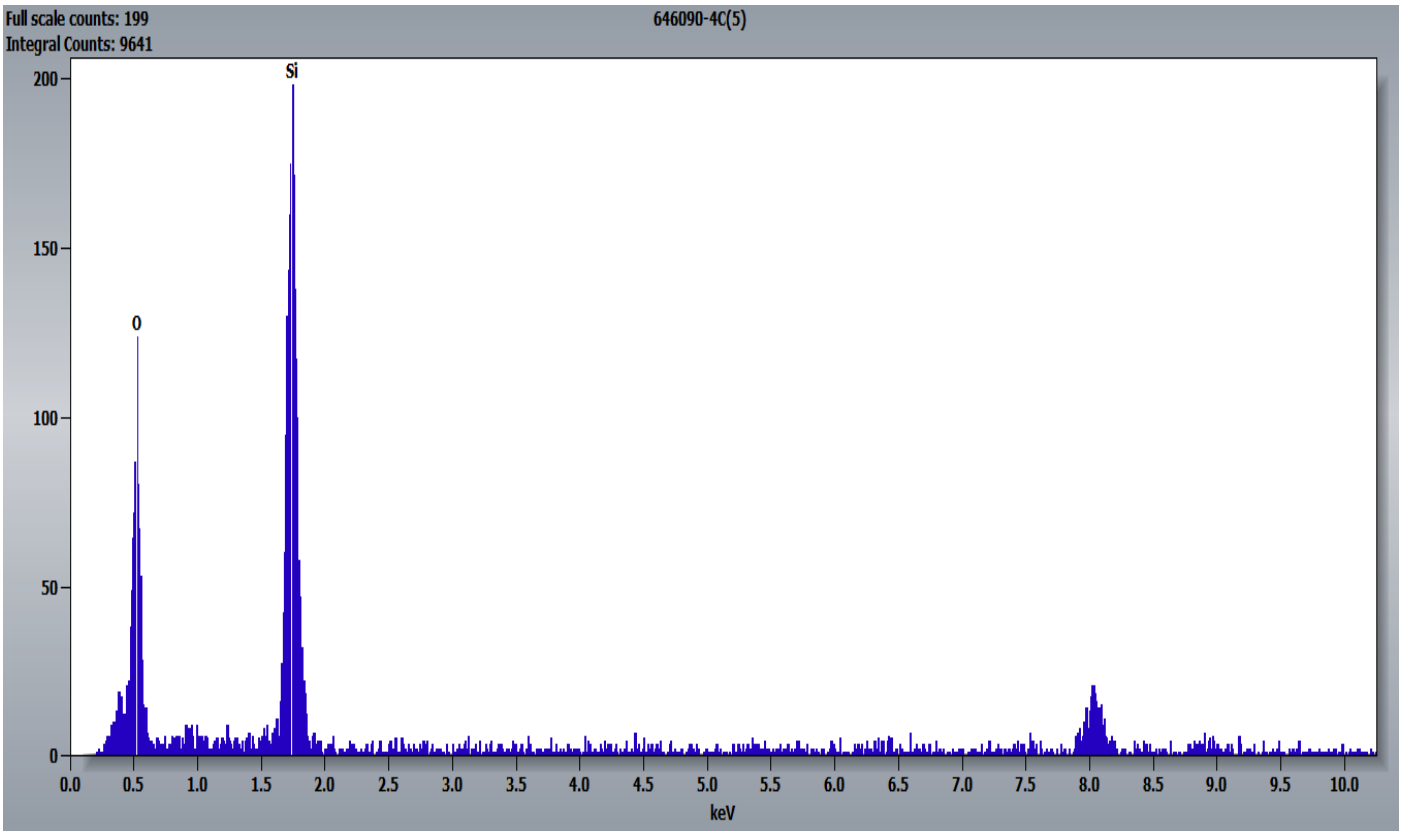
Chemistry from the Calcium Particles Pictured Above



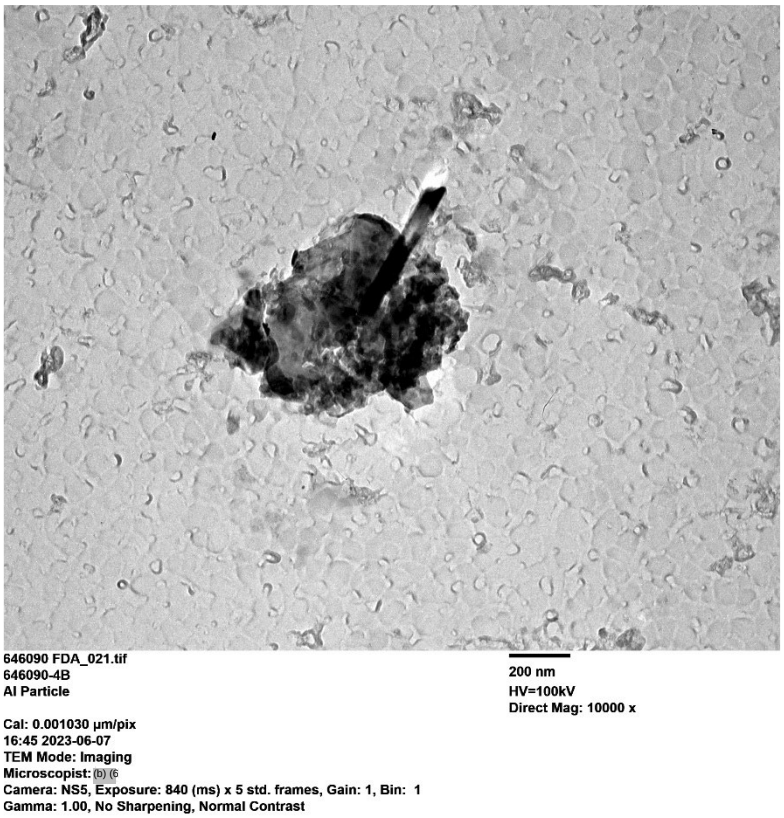
646090-4C, Silicon Particle



Chemistry from the Aluminum Particle Pictured Above



646090-4B, Aluminum Particle



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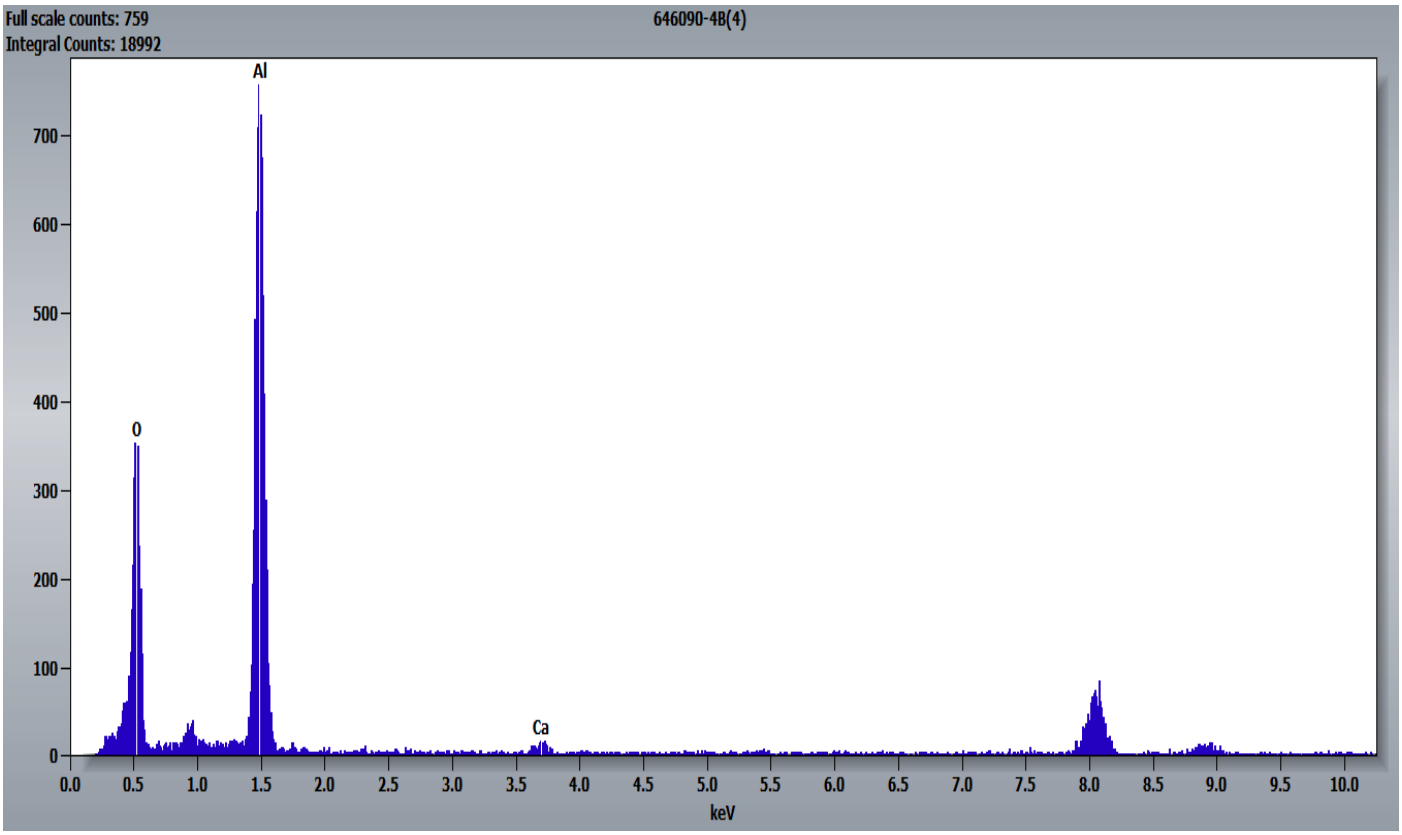
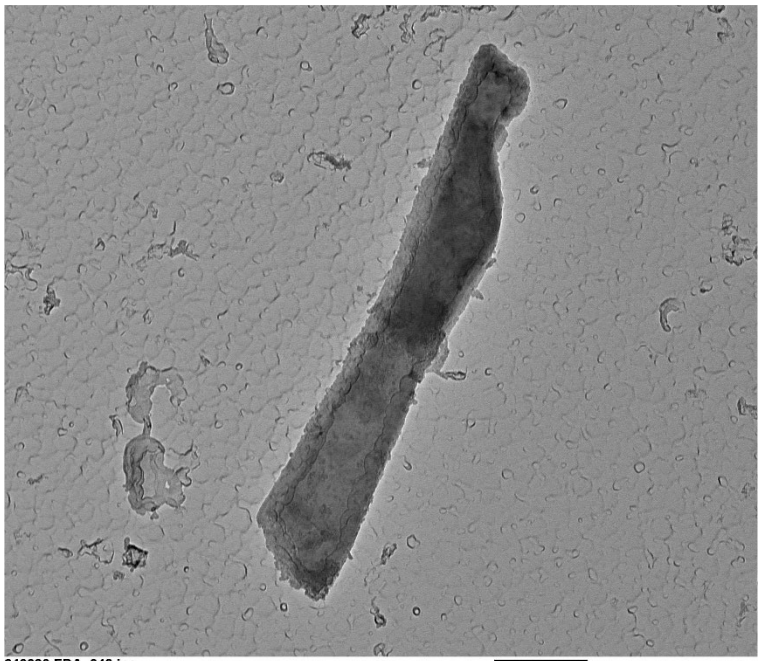
Chemistry from the Aluminum Particle Pictured Above

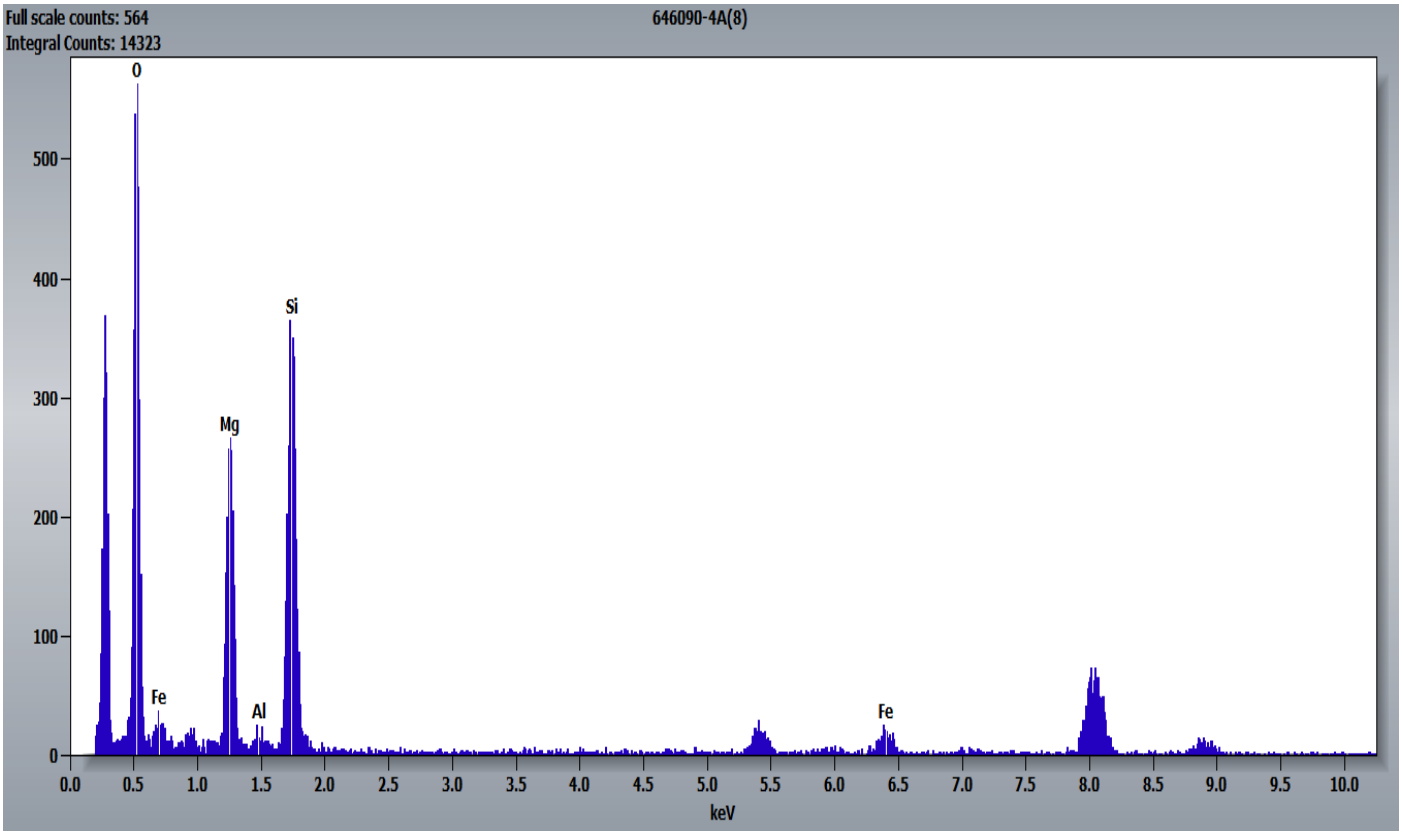


646090-4A, Elongated Talc Particle

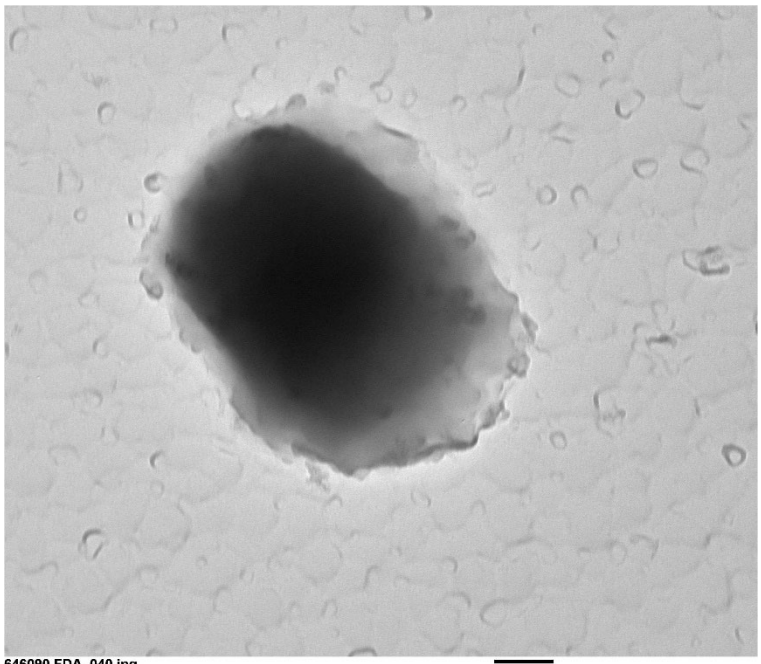


Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

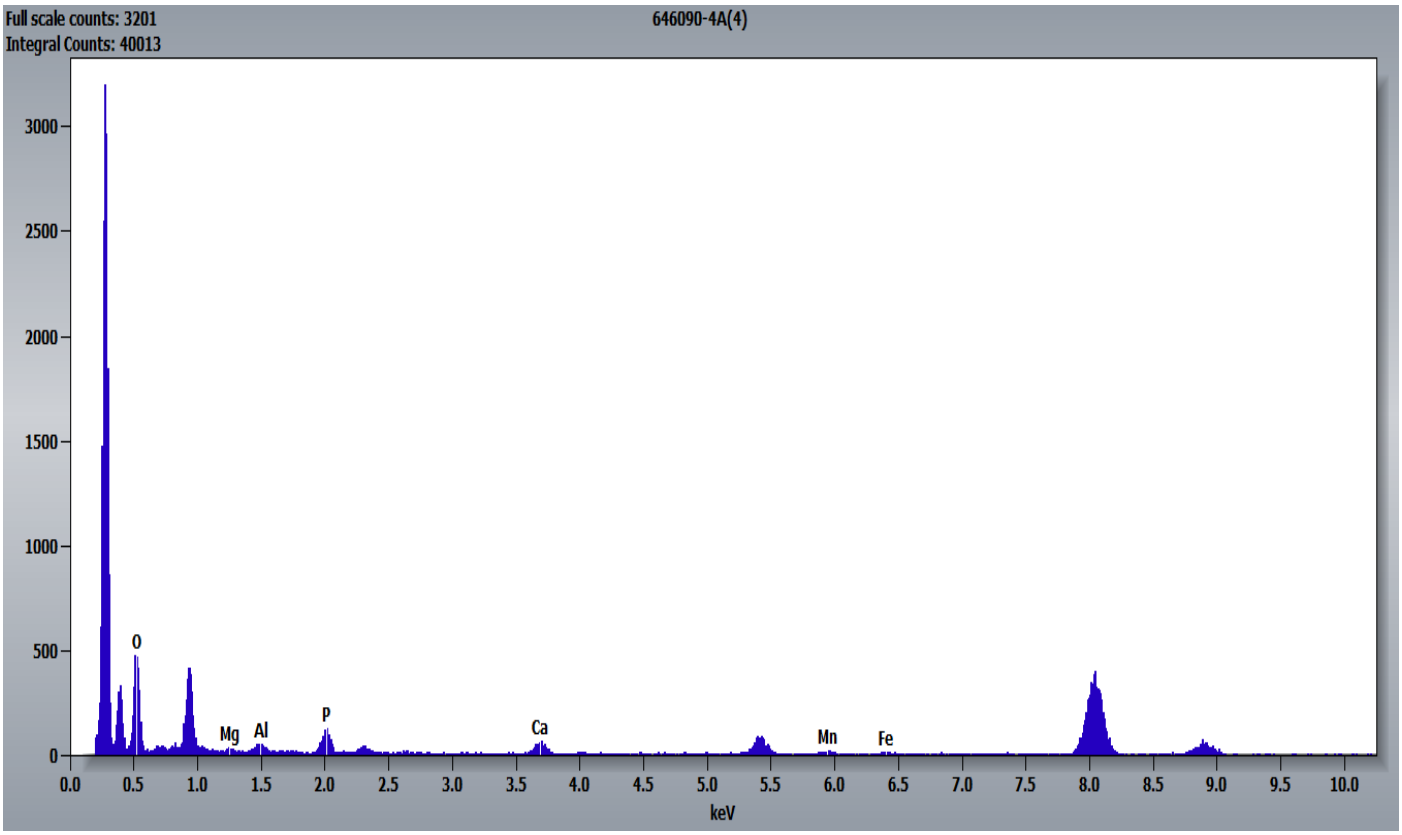
Chemistry from the Elongated Talc Particle Pictured Above



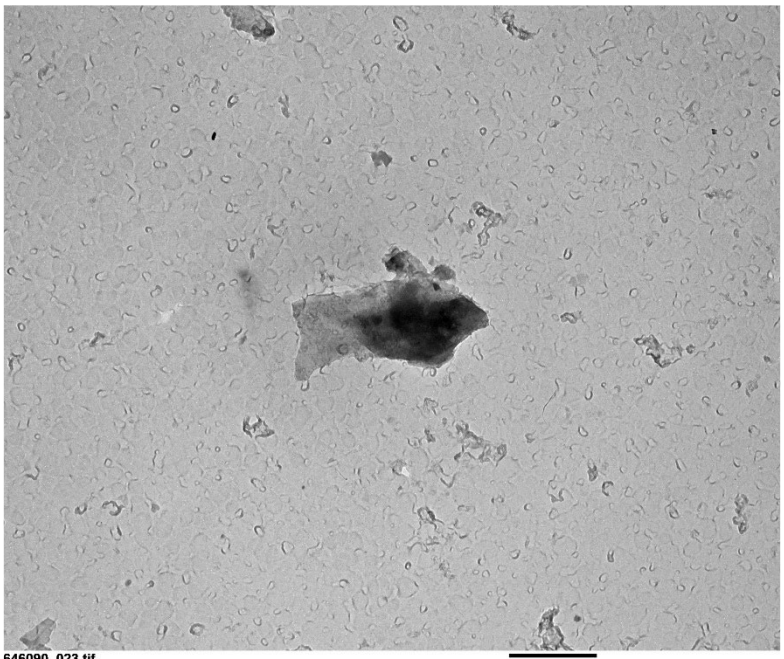
646090-4A, Particle Containing Phosphorus and Calcium



Chemistry from the Particle Containing Phosphorus and Calcium Pictured Above



646090-4B, Particle Containing Magnesium, Aluminum, Silicon, and Iron

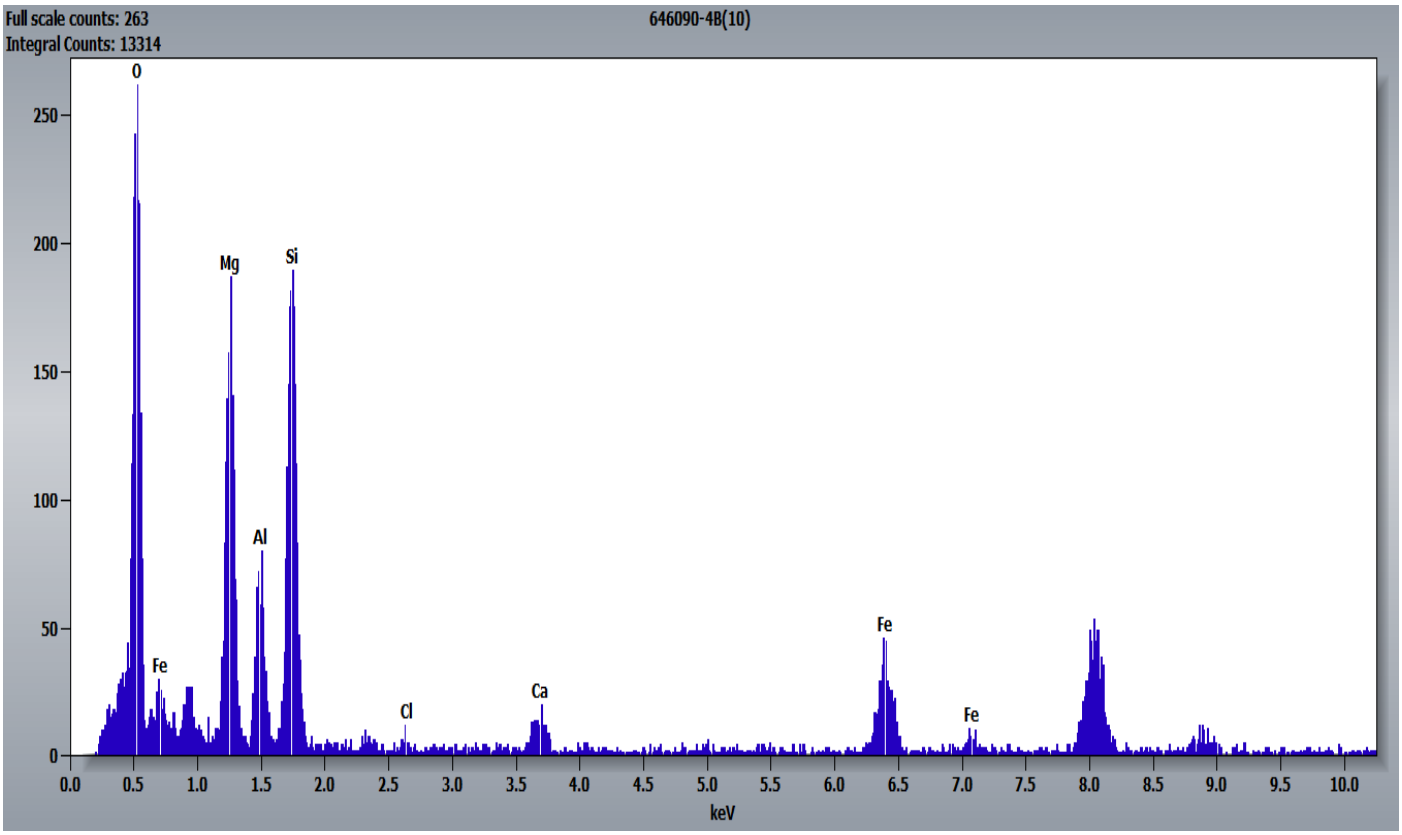


646090_023.tif
646090-4B FDA
Mg, Al, Si, Fe Particle

Cal: 0.001430 µm/pix
10:18 2023-06-08
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x

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



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646090-5A, 5B, 5C/Client Sample: 04032023-5

PLM

All three aliquots of sample 04032023-5 were analyzed by (b) (6) on June 9, 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.

646090-5A	No Asbestos Detected
646090-5B	No Asbestos Detected
646090-5C	No Asbestos Detected

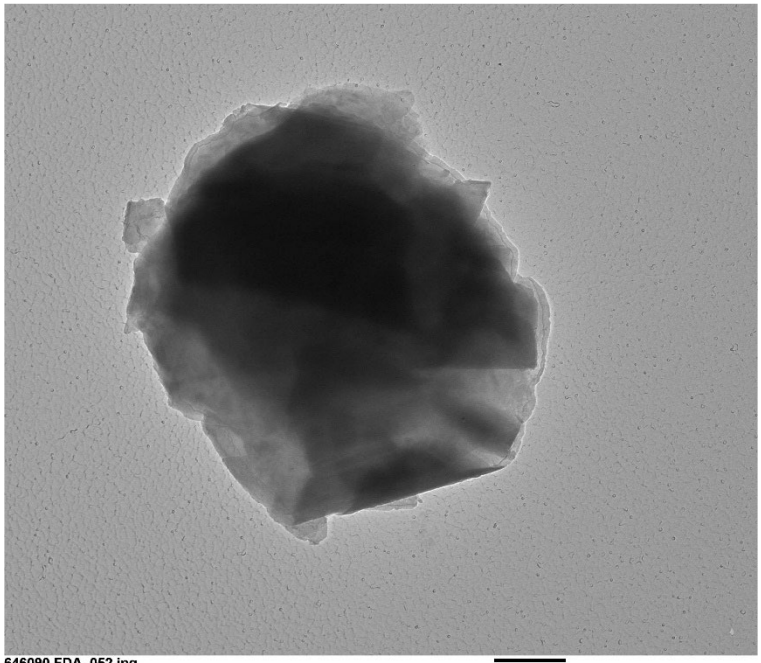
TEM

(b) (6) analyzed aliquot 5A on June 7, 2023, and aliquot 5C on June 9, 2023. (b) (6) analyzed aliquot 5B on June 9, 2023. The primary particle observed was talc; talc ribbons/fibers were also observed along with mica "like" particles, titanium particles, calcium particles, particles containing phosphorous and calcium, and particles containing magnesium, aluminum, silicon and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

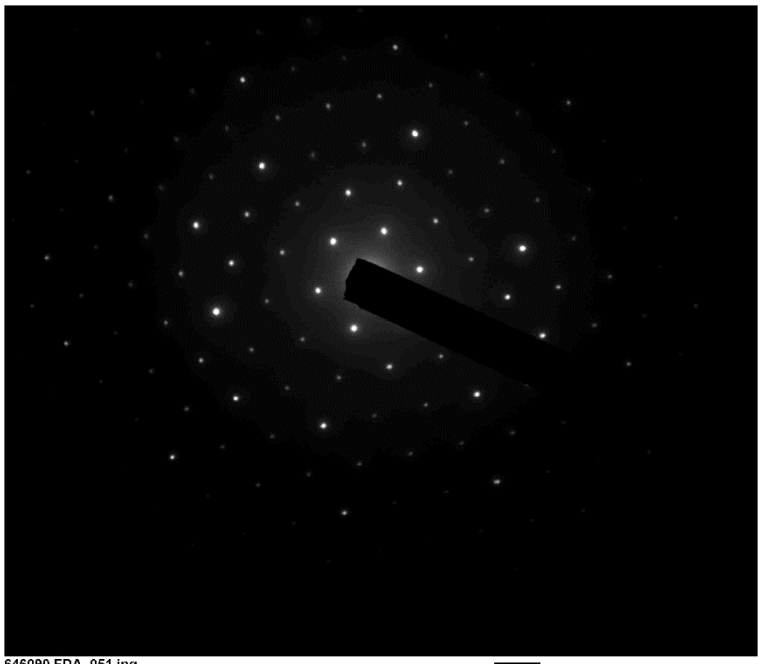
646090-5A	No Asbestos Detected
646090-5B	No Asbestos Detected
646090-5C	No Asbestos Detected

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.

646090-5A, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

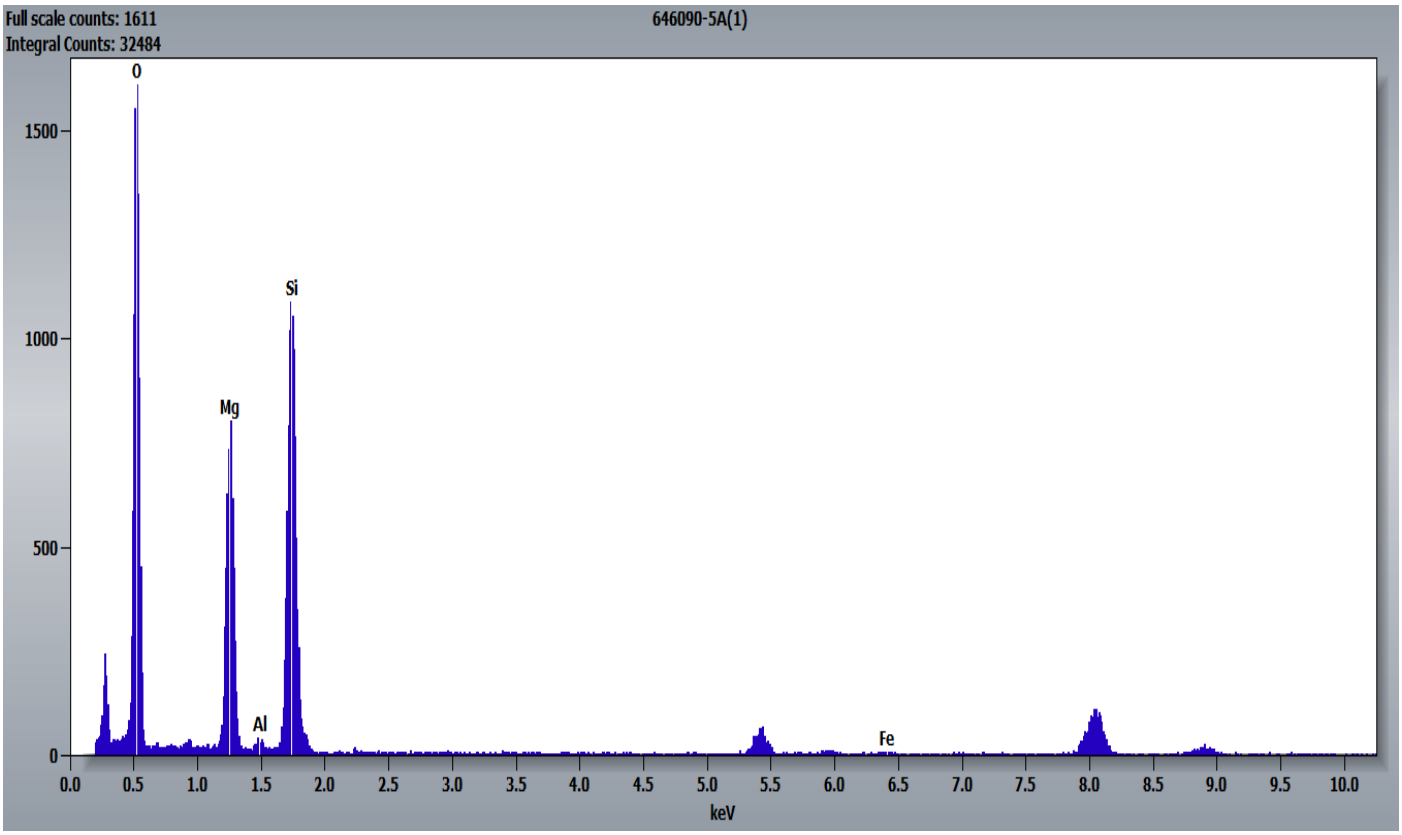


646090 FDA_051.jpg
646090-5A
Talc Particle

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

12:36 2023-06-07
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



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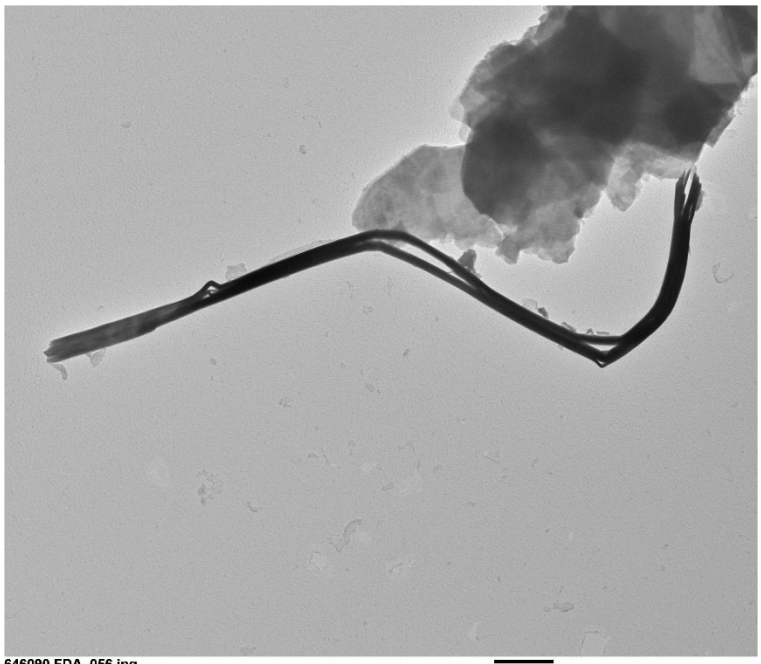
646090-5A, Talc Ribbon

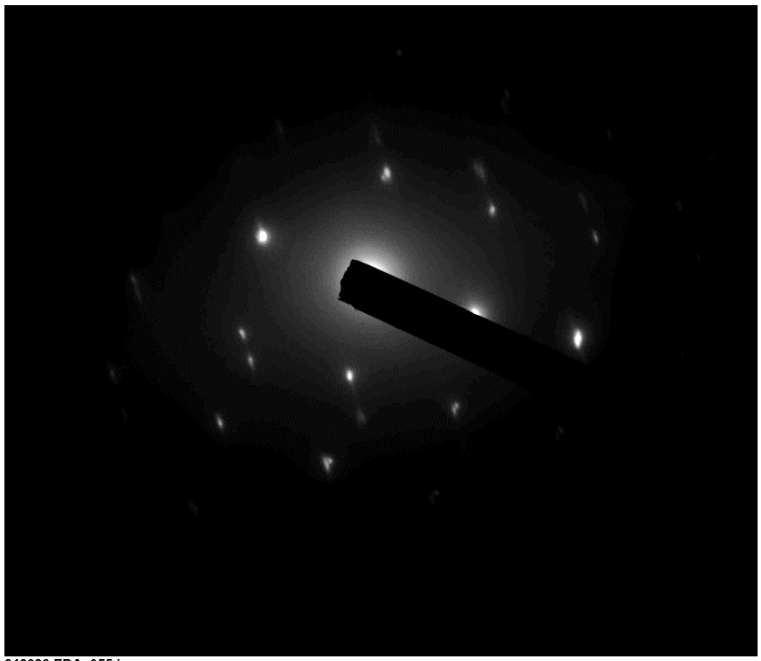


646090 FDA_056.jpg
646090-5A
Talc Ribbon

Cal: 0.004774 µm/pix
12:53 2023-06-07
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

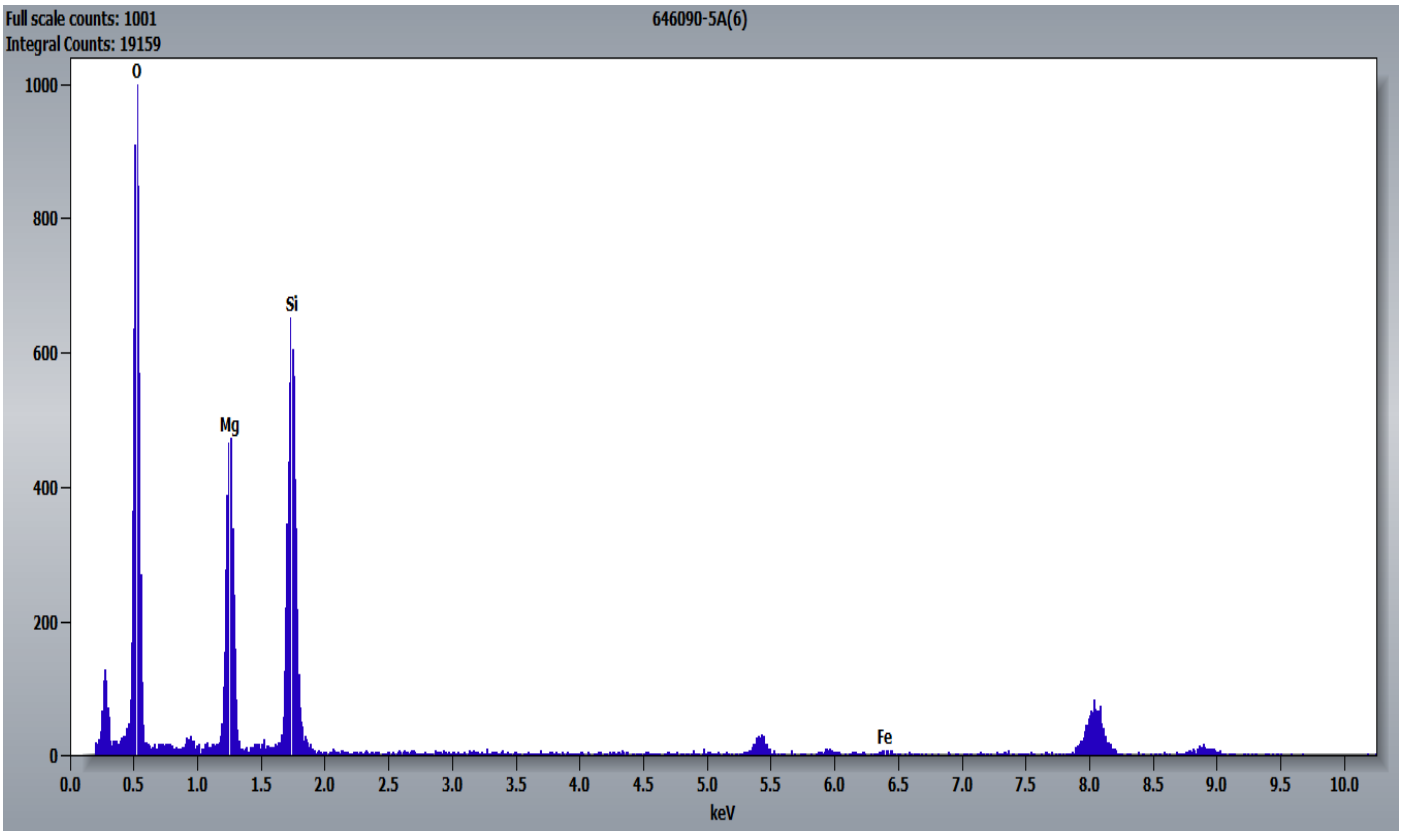


646090 FDA_055.jpg
646090-5A
Talc Ribbon

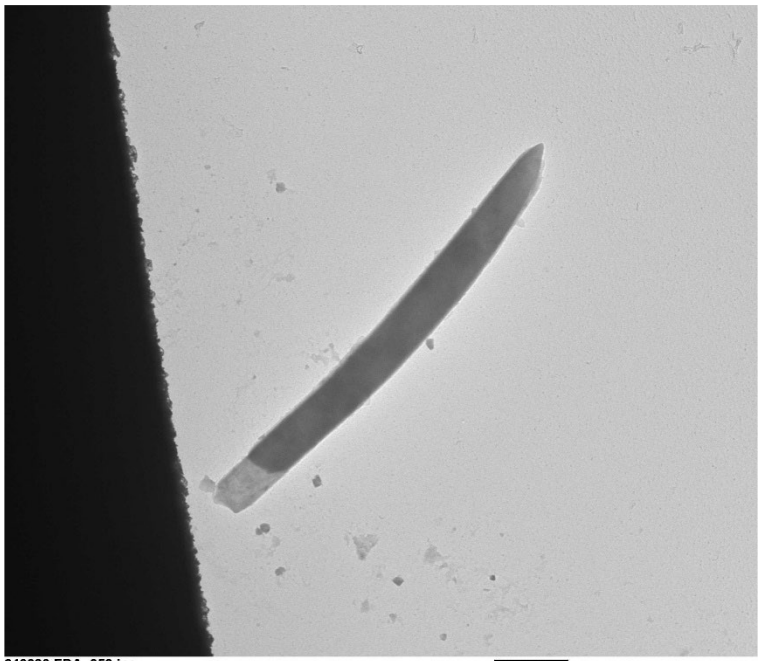
Cal: 0.001905 µm/pix
12:52 2023-06-07
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Talc Ribbon Pictured Above



646090-5A, Elongated Talc Particle

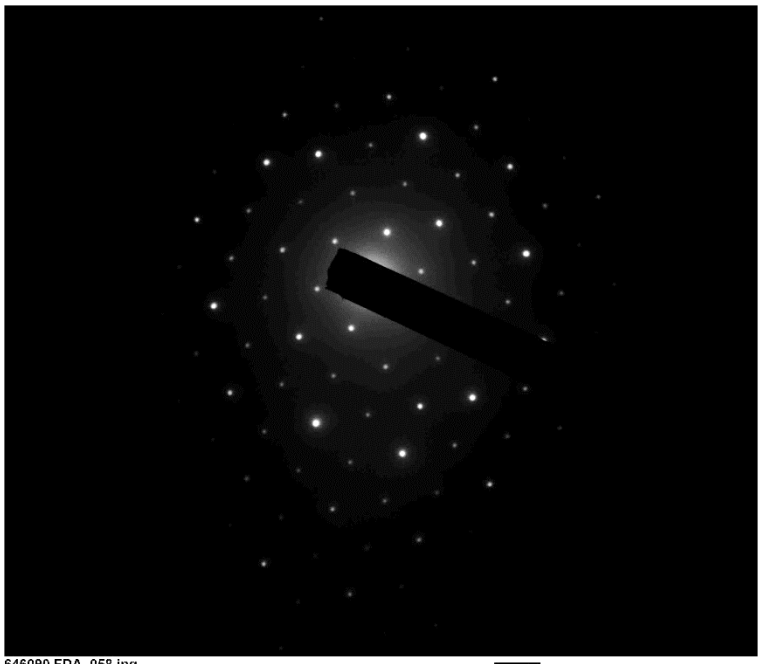


646090 FDA_059.jpg
646090-5A
Talc Fiber

Cal: 0.003819 µm/pix
13:07 2023-06-07
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

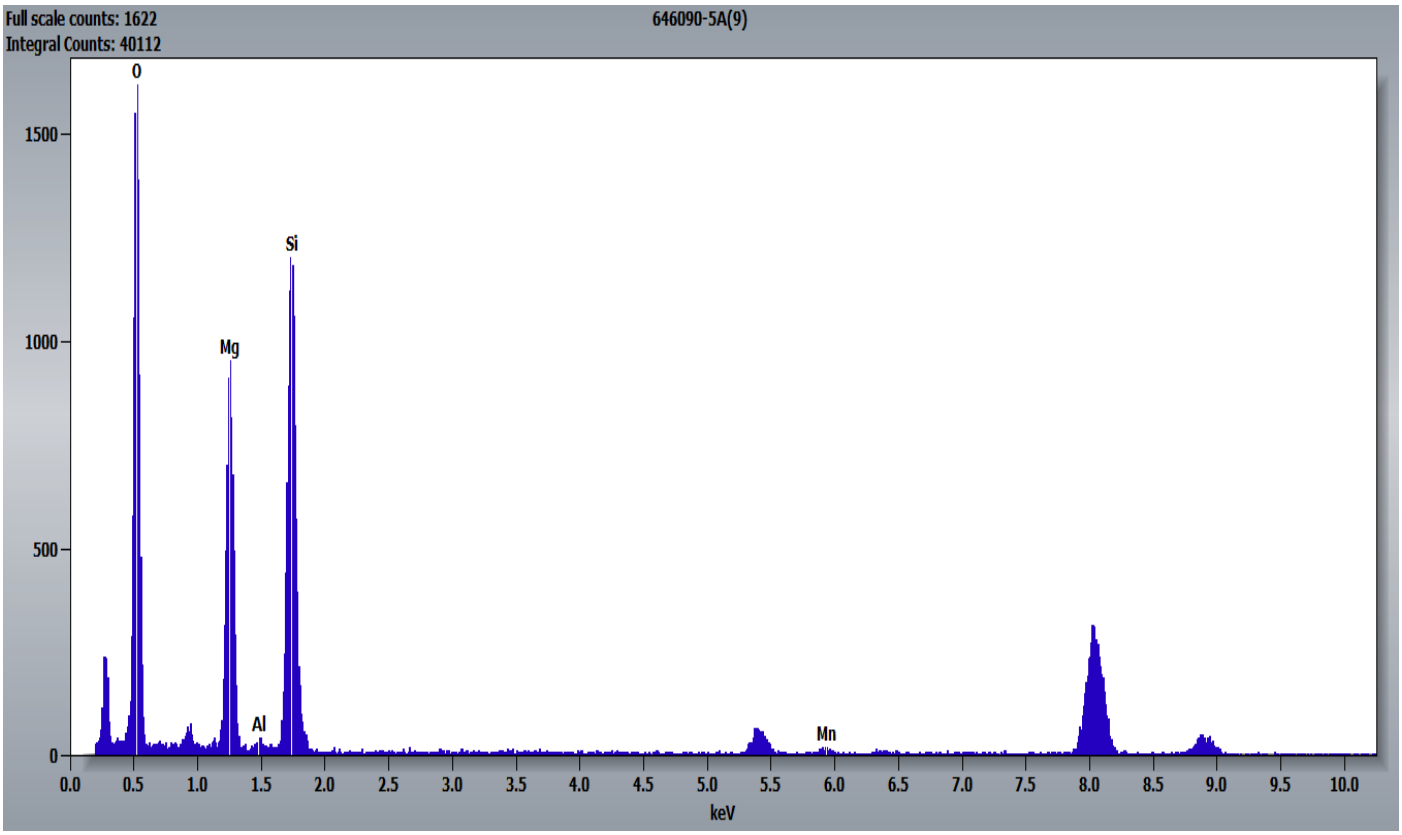


646090 FDA_058.jpg
646090-5A
Talc Fiber

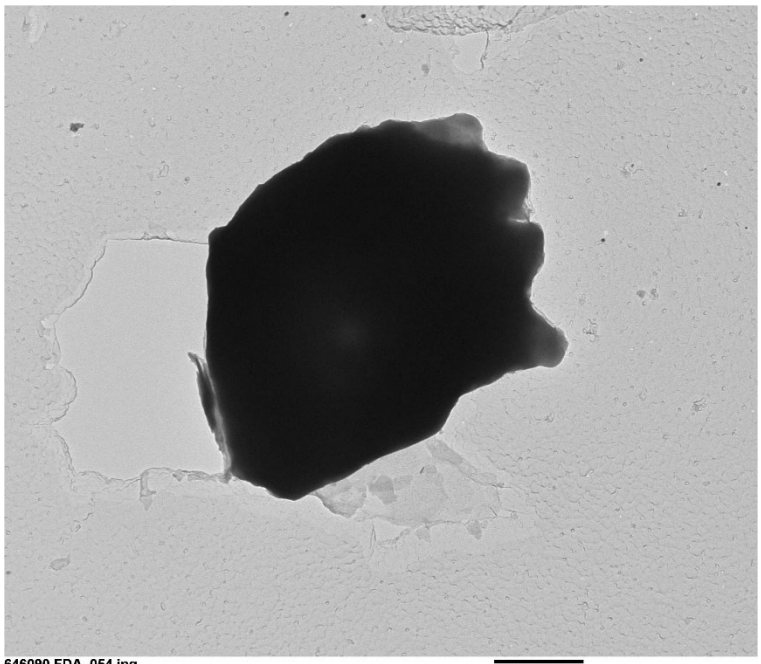
Cal: 0.003183 µm/pix
13:06 2023-06-07
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Elongated Talc Particle Pictured Above



646090-5A, Particle Containing Sodium, Magnesium, Potassium, and Calcium

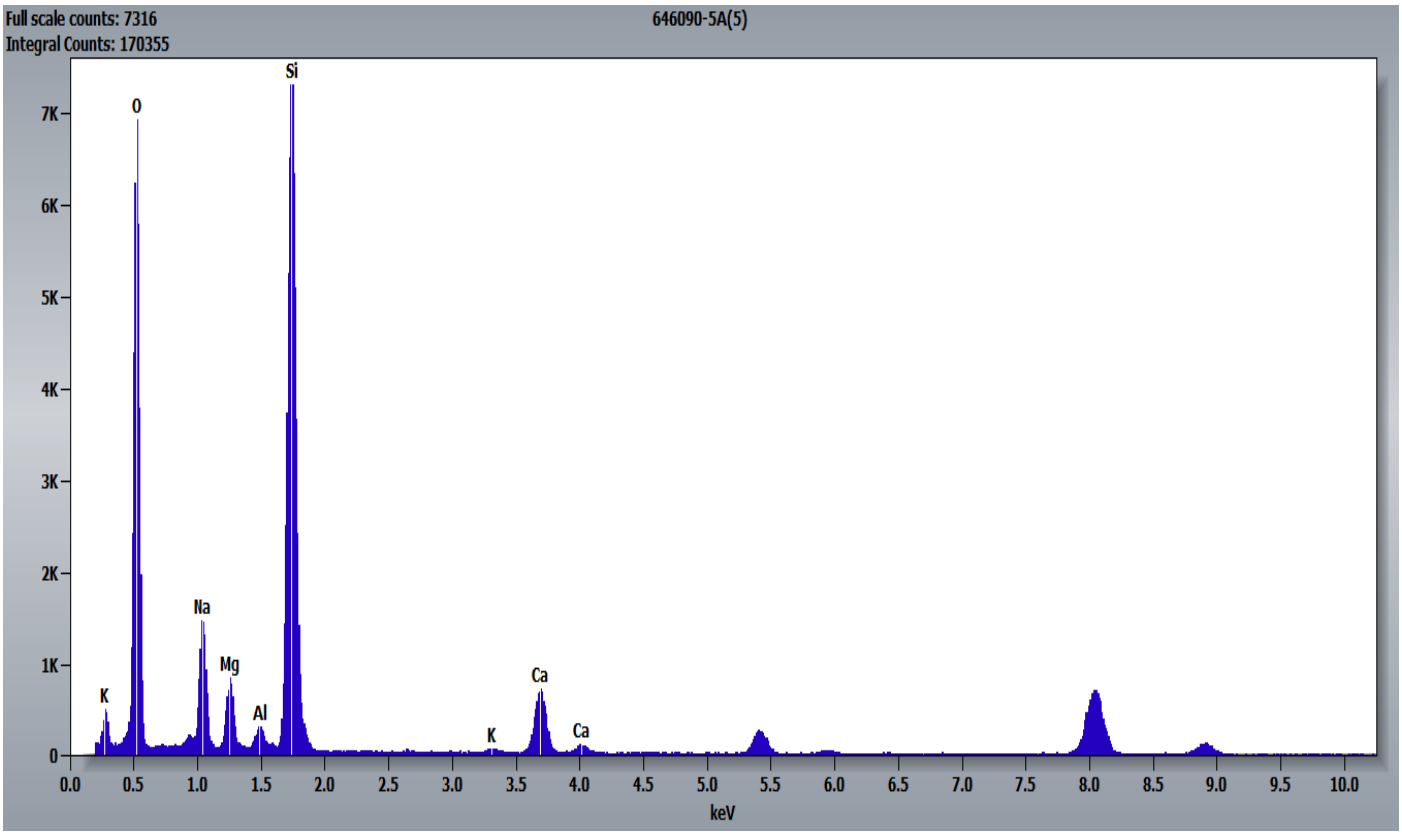


646090 FDA_054.jpg
646090-5A
Na,Mg,Si,K,Ca

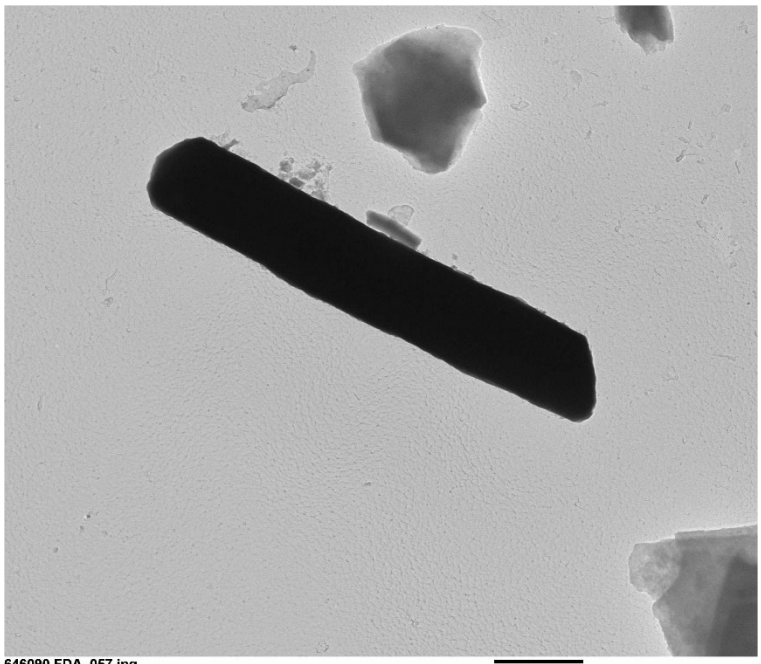
Cal: 0.001905 µm/pix
12:49 2023-06-07
TEM Mode: Imaging
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=80kV
Direct Mag: 5000 x

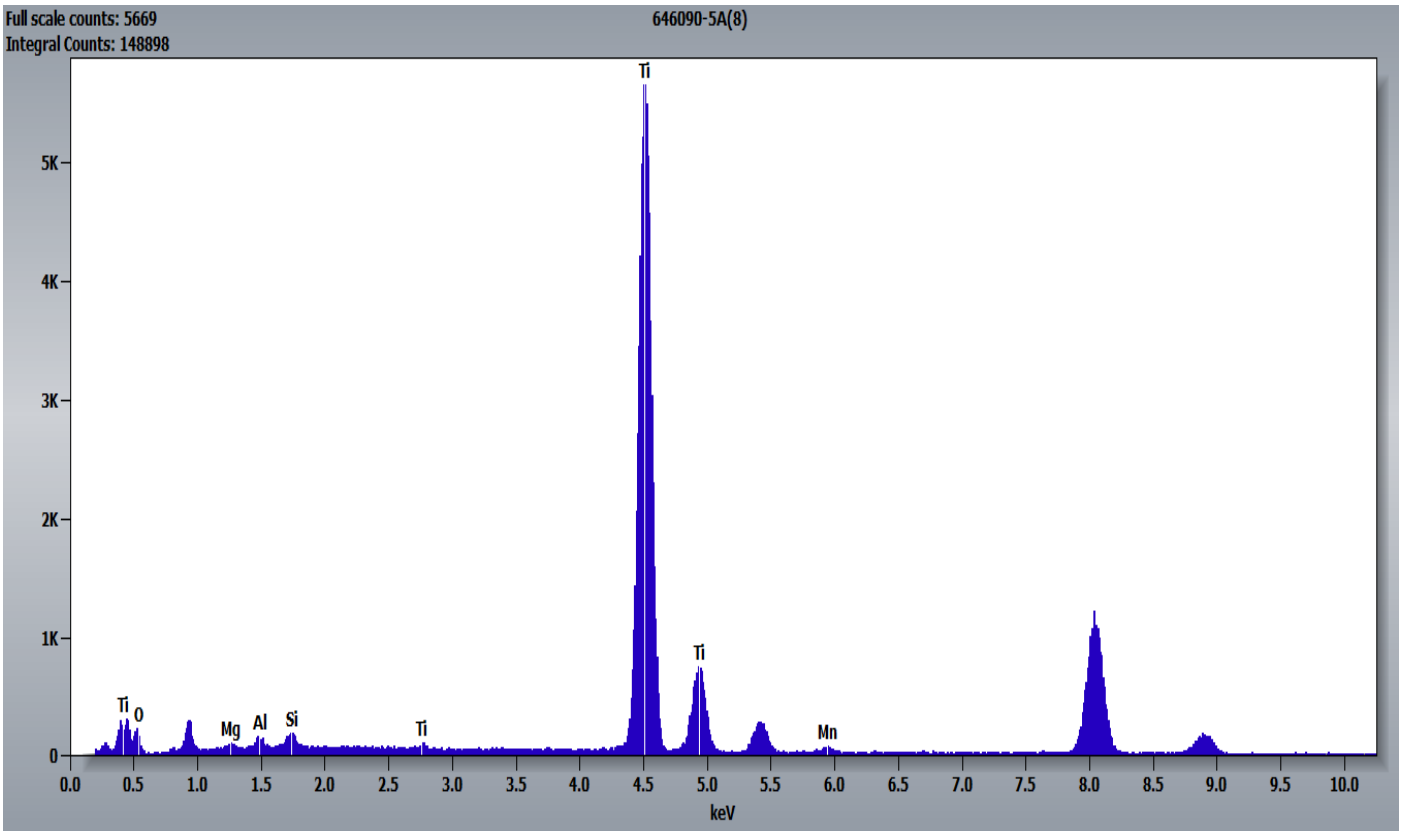
Chemistry from the Particle Containing Sodium, Magnesium, Potassium, and Calcium Pictured Above



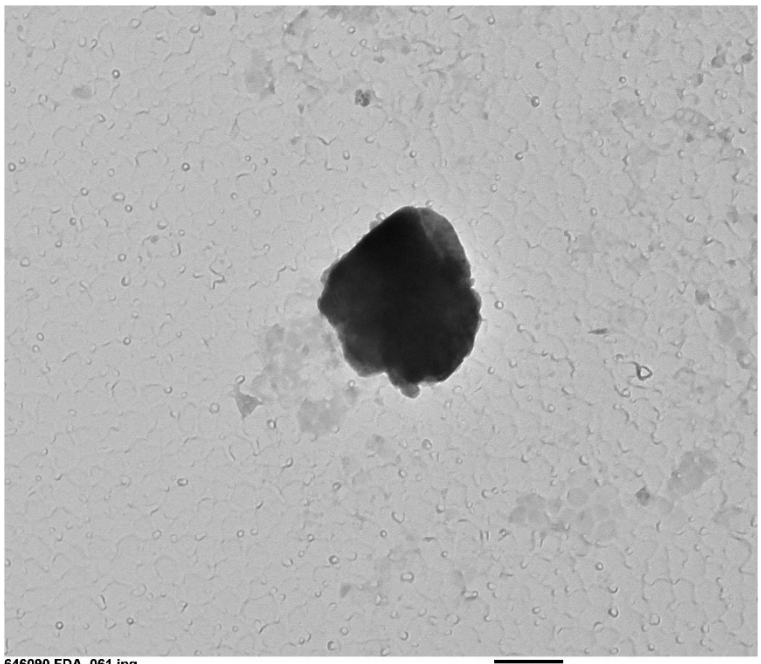
646090-5A, Elongated Titanium Particle



Chemistry from the Elongated Titanium Particle Pictured Above



646090-5A, Calcium Particle

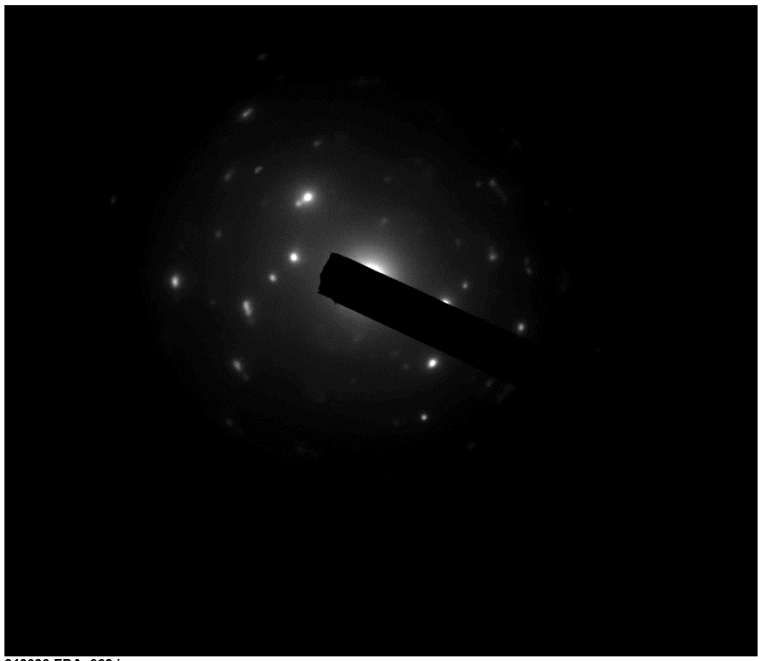


646090 FDA_061.jpg
646090-5A
Ca particle

Cal: 0.000817 µm/pix
13:11 2023-06-07
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

200 nm
HV=80kV
Direct Mag: 12000 x

Diffraction Pattern from the Calcium Particle Pictured Above

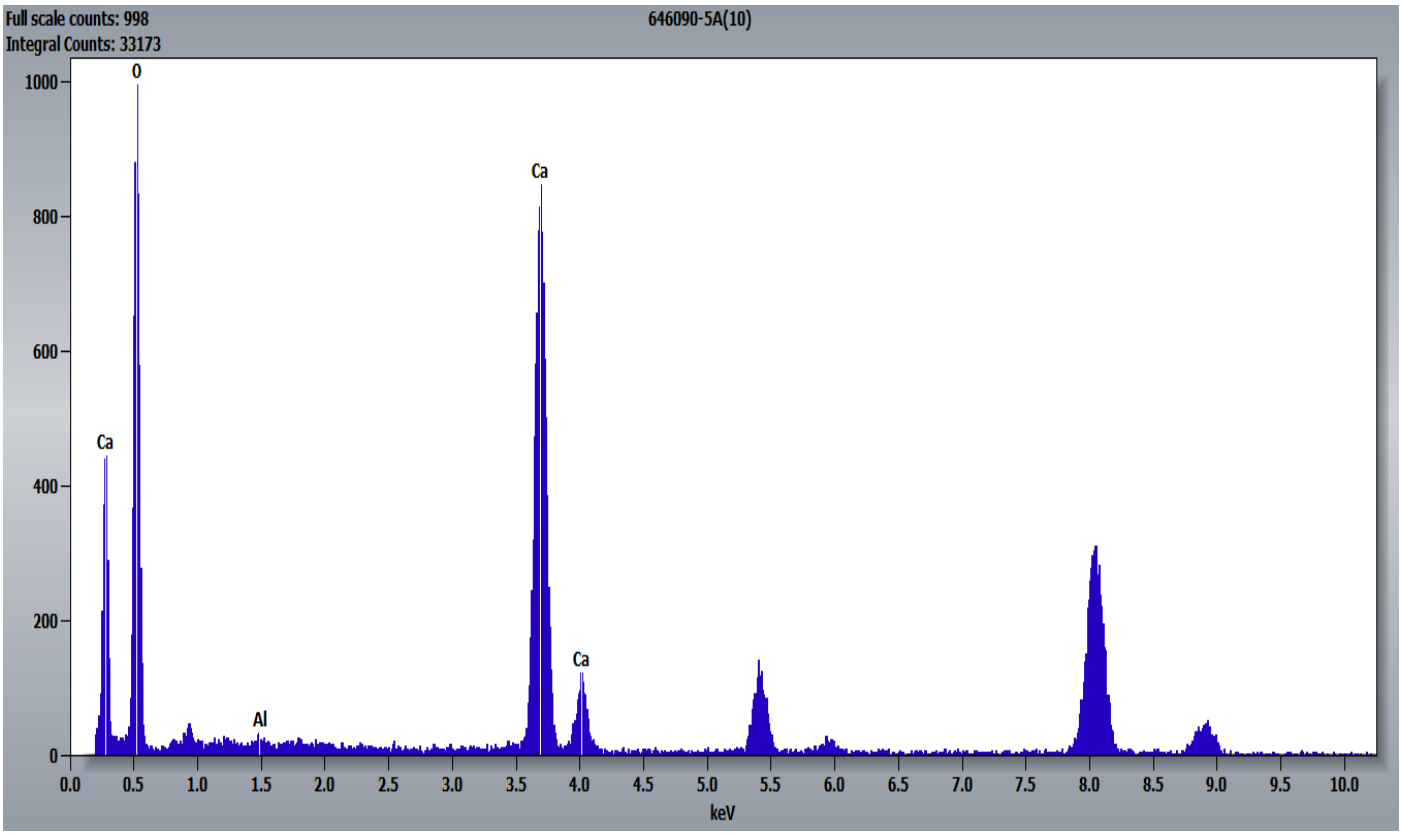


646090 FDA_060.jpg
646090-5A
Ca particle

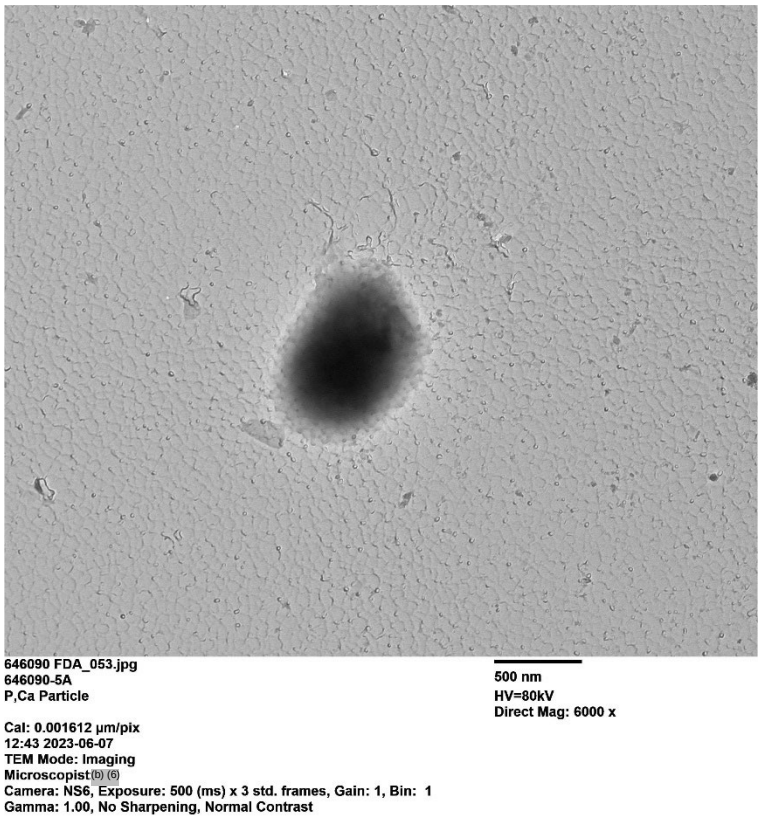
Cal: 0.003819 µm/pix
13:11 2023-06-07
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

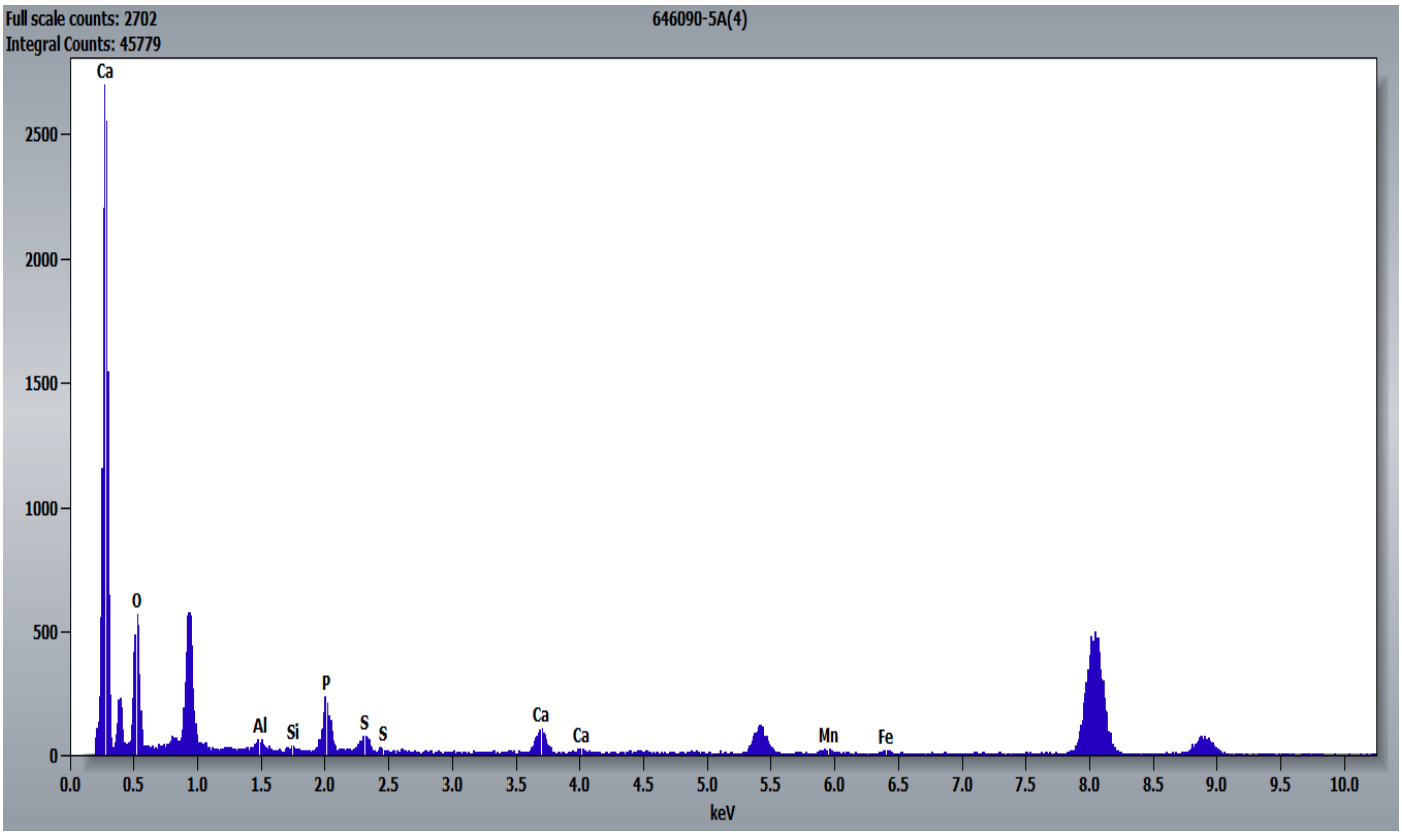
Chemistry from the Calcium Particle Pictured Above



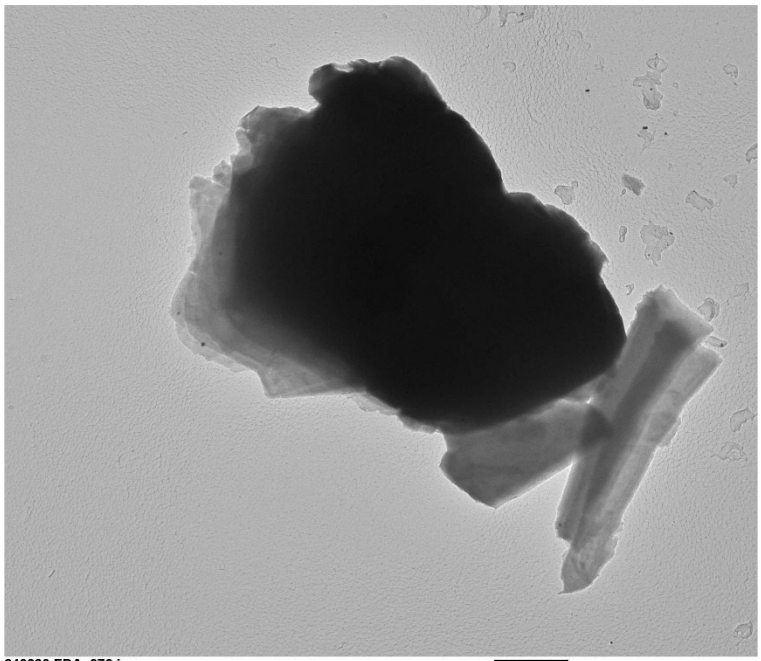
646090-5A, Particle Containing Phosphoros and Calcium



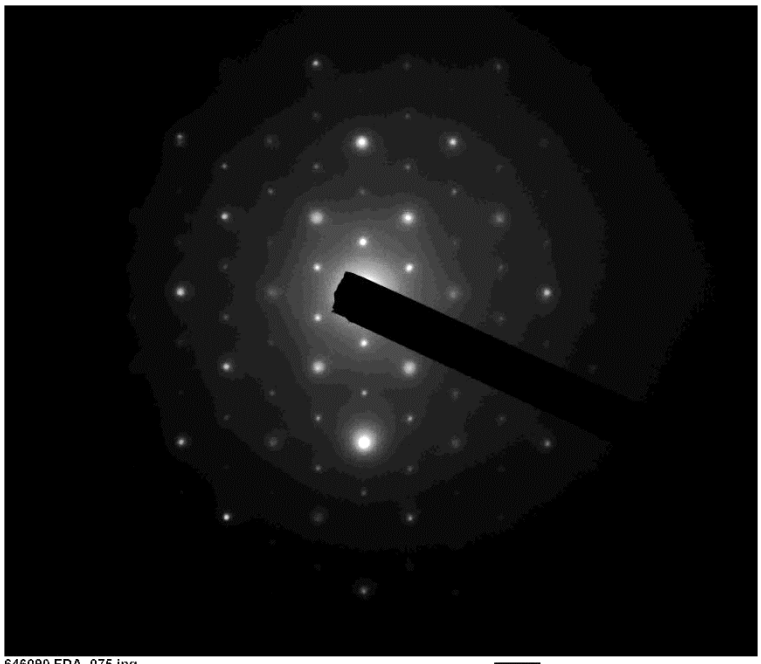
Chemistry from the Particle Containing Phosphoros and Calcium Pictured Above



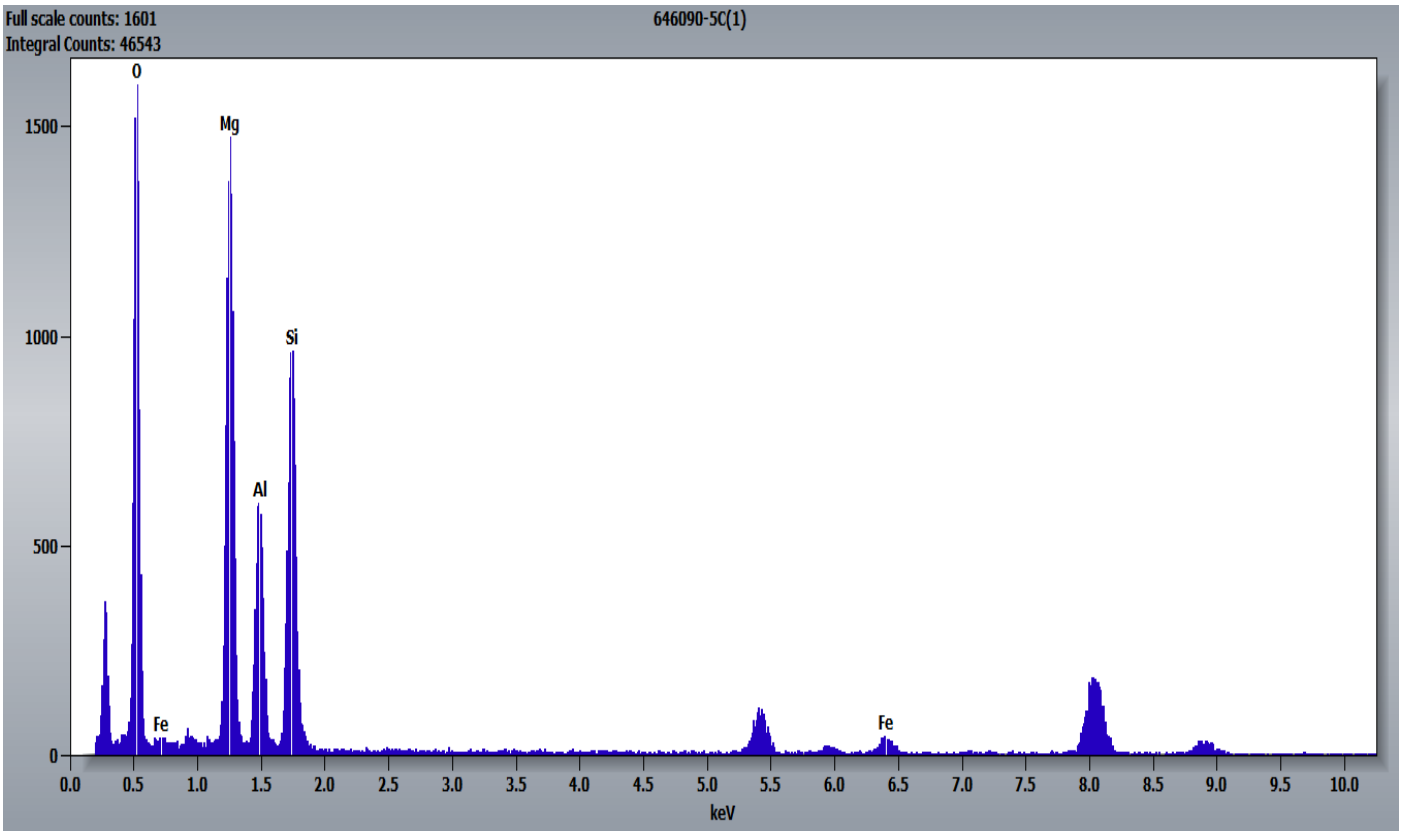
646090-5C, Particle Containing Magnesium, Aluminum, Silicon, and Iron



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



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



646090-6A, 6B, 6C/Client Sample: 04032023-6

PLM

All three aliquots of sample 04032023-6 were analyzed by (b) (6) on June 9, 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.

646090-6A	No Asbestos Detected
646090-6B	No Asbestos Detected
646090-6C	No Asbestos Detected

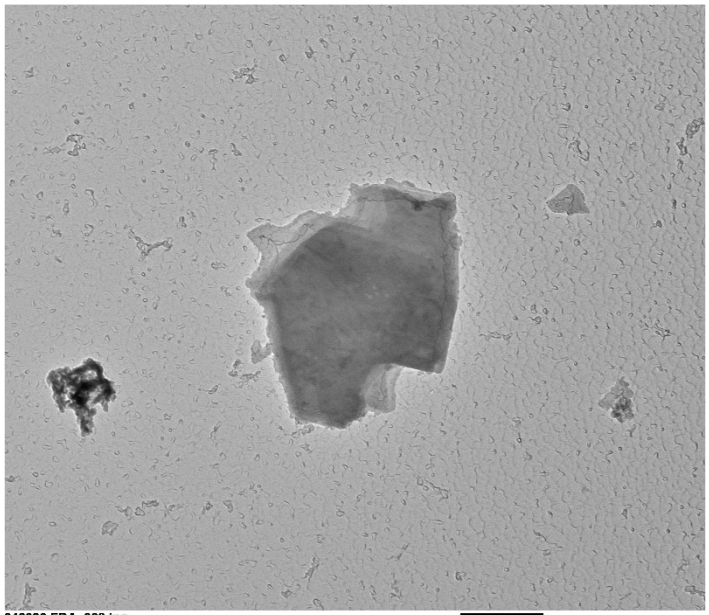
TEM

(b) (6) analyzed aliquot 6A on June 8, 2023. (b) (6) analyzed aliquot 6B on June 13, 2023, and (b) (6) analyzed aliquot 6C on June 14, 2023. The primary particle observed was talc; mica particles and talc ribbons/fibers were also observed along with silicon particles, particles containing sodium, aluminum, silicon, and iron, particles containing magnesium, aluminum, and silicon, silica spheres with aluminum and chromium, and particles containing magnesium, aluminum, silicon, and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

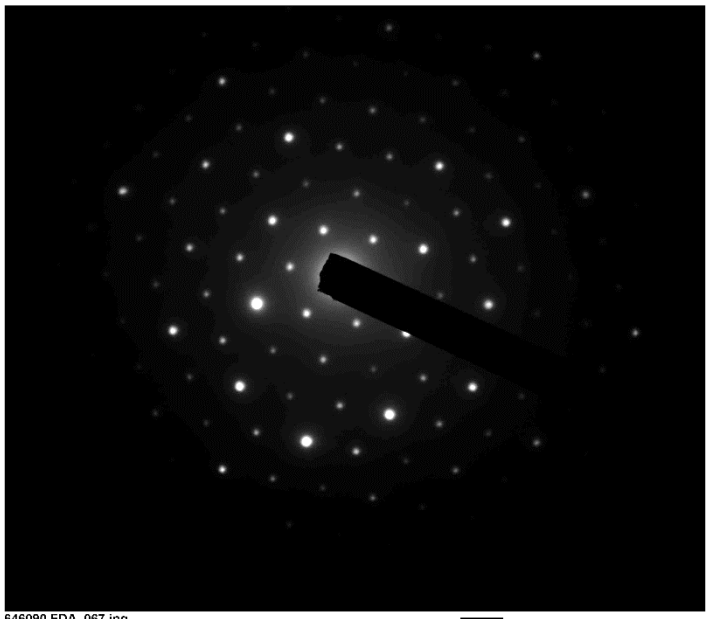
646090-6A	No Asbestos Detected
646090-6B	No Asbestos Detected
646090-6C	No Asbestos Detected

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.

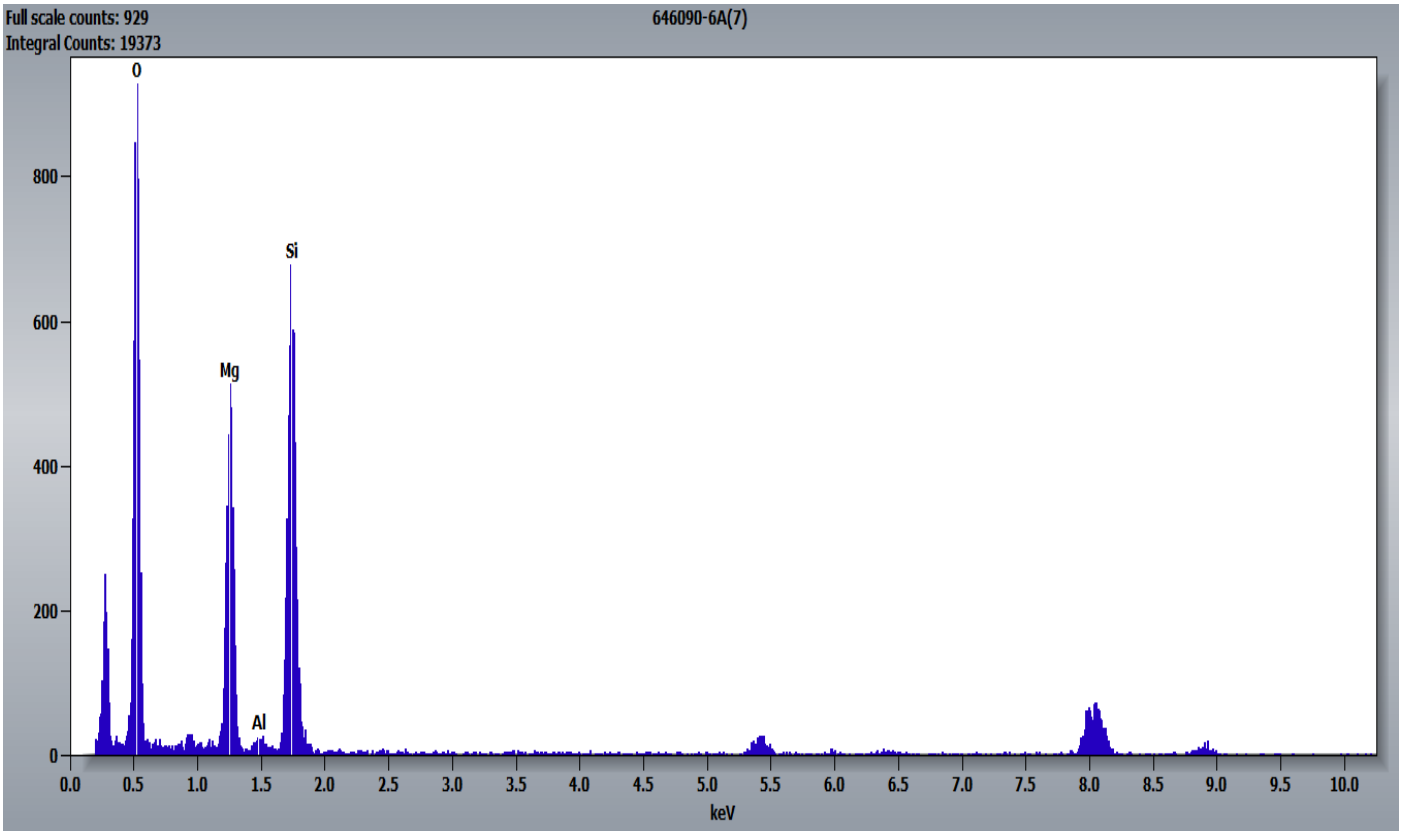
646090-6A, Talc Particle



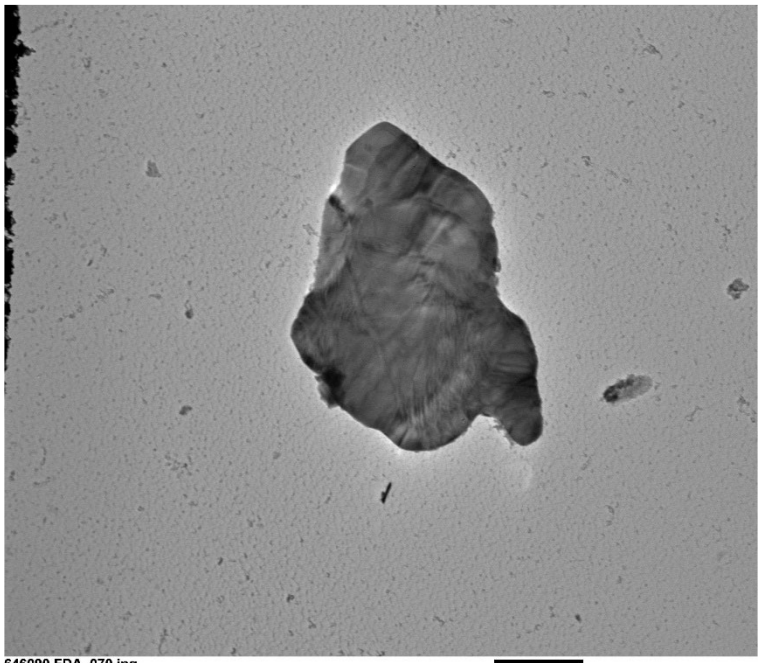
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



Chemistry from the Talc Particle Pictured Above



646090-6A, Mica Particle

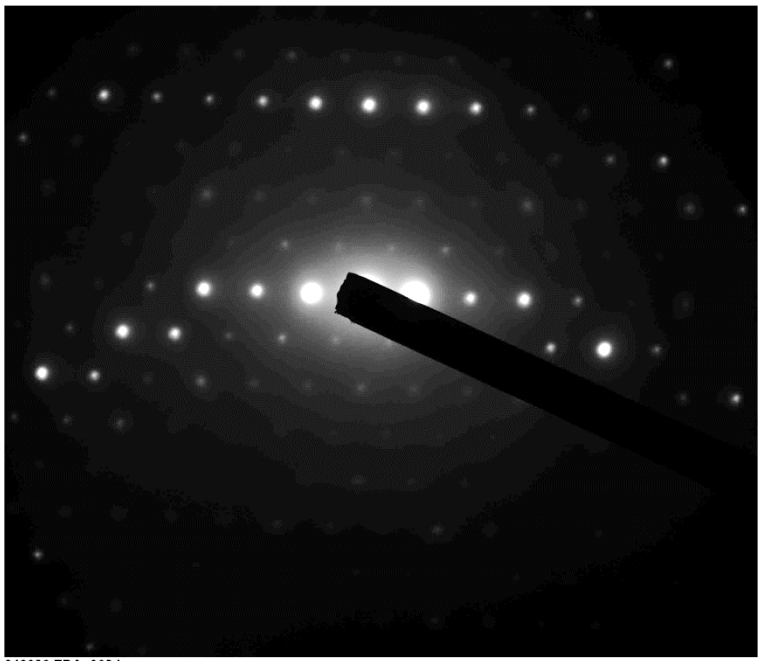


646090 FDA_070.jpg
646090-6A
Mica Particle

Cal: 0.003183 µm/pix
11:49 2023-06-08
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 Mica Particle Pictured Above

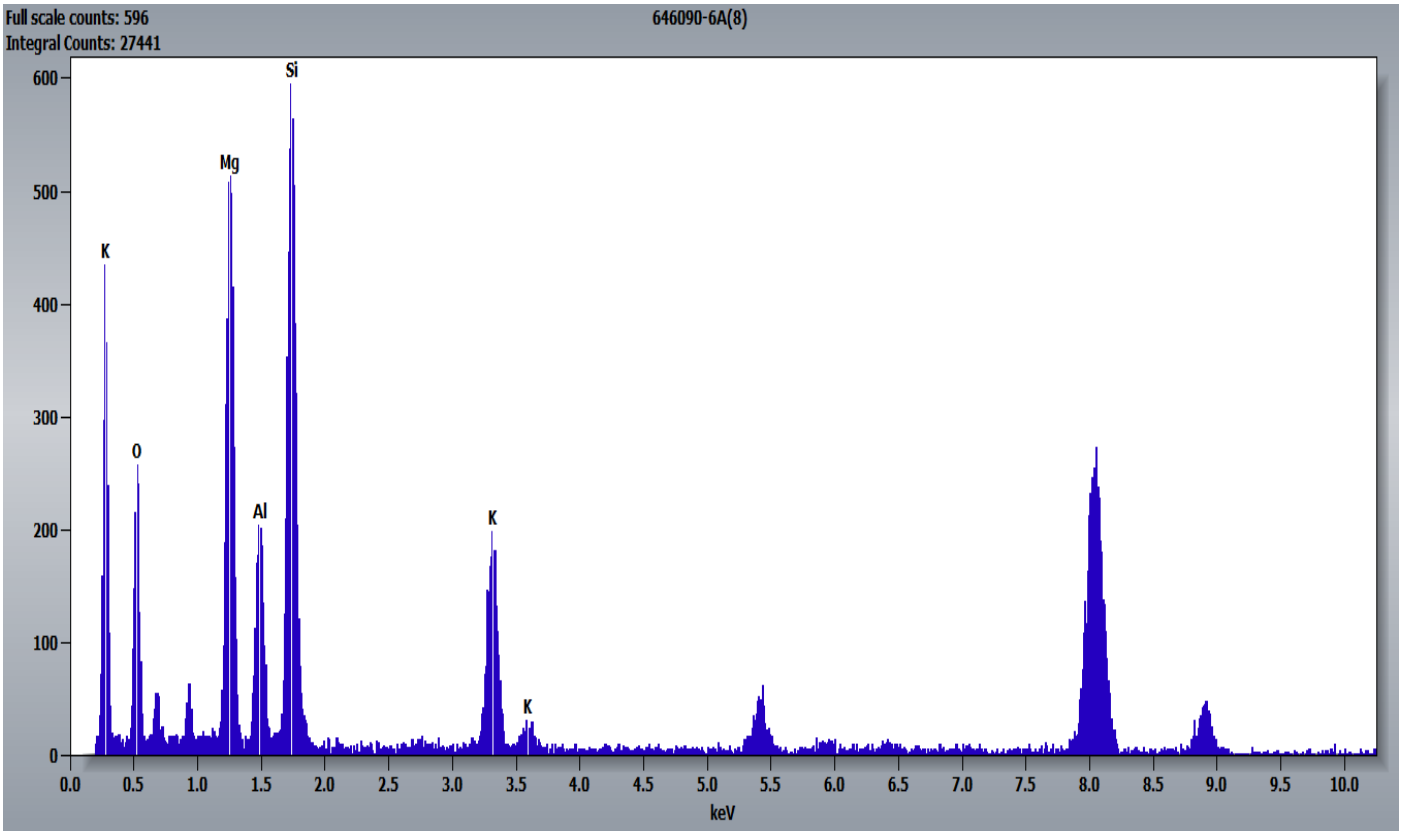


646090 FDA_069.jpg
646090-6A
Mica Particle

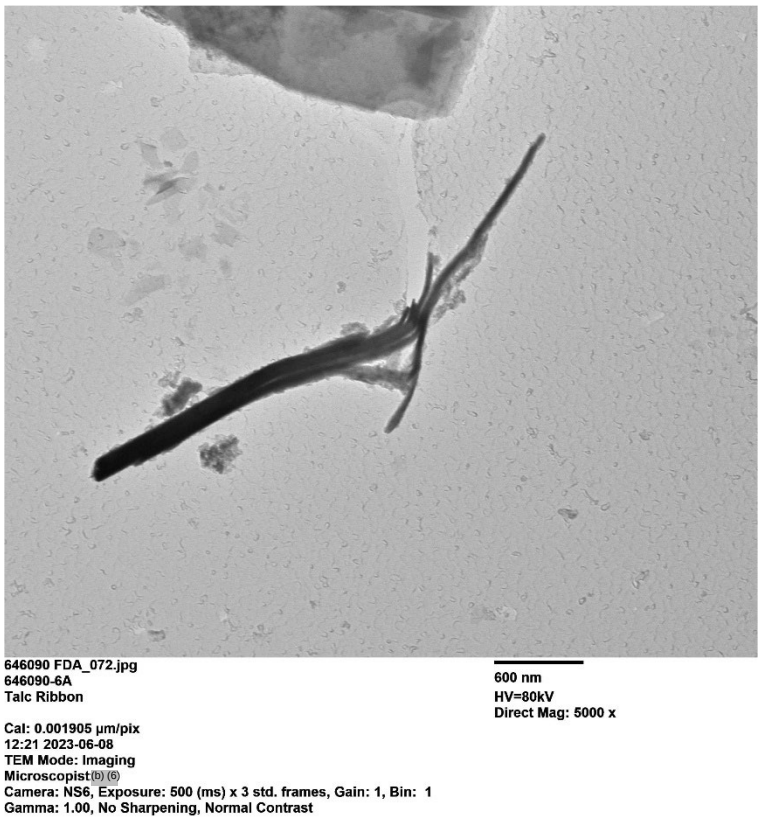
Cal: 0.001905 µm/pix
11:48 2023-06-08
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

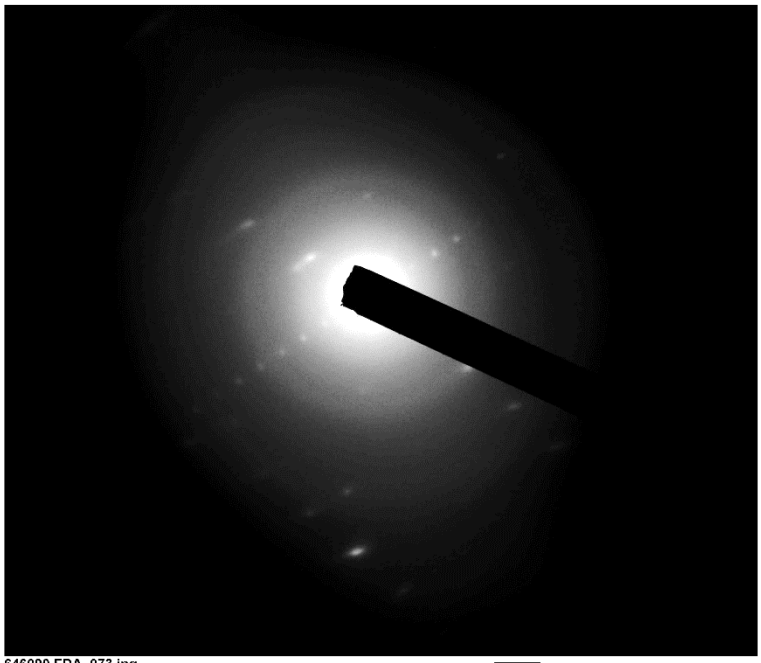
Chemistry from the Mica Particle Pictured Above



646090-6A, Talc Ribbon



Diffraction Pattern from the Talc Ribbon Pictured Above

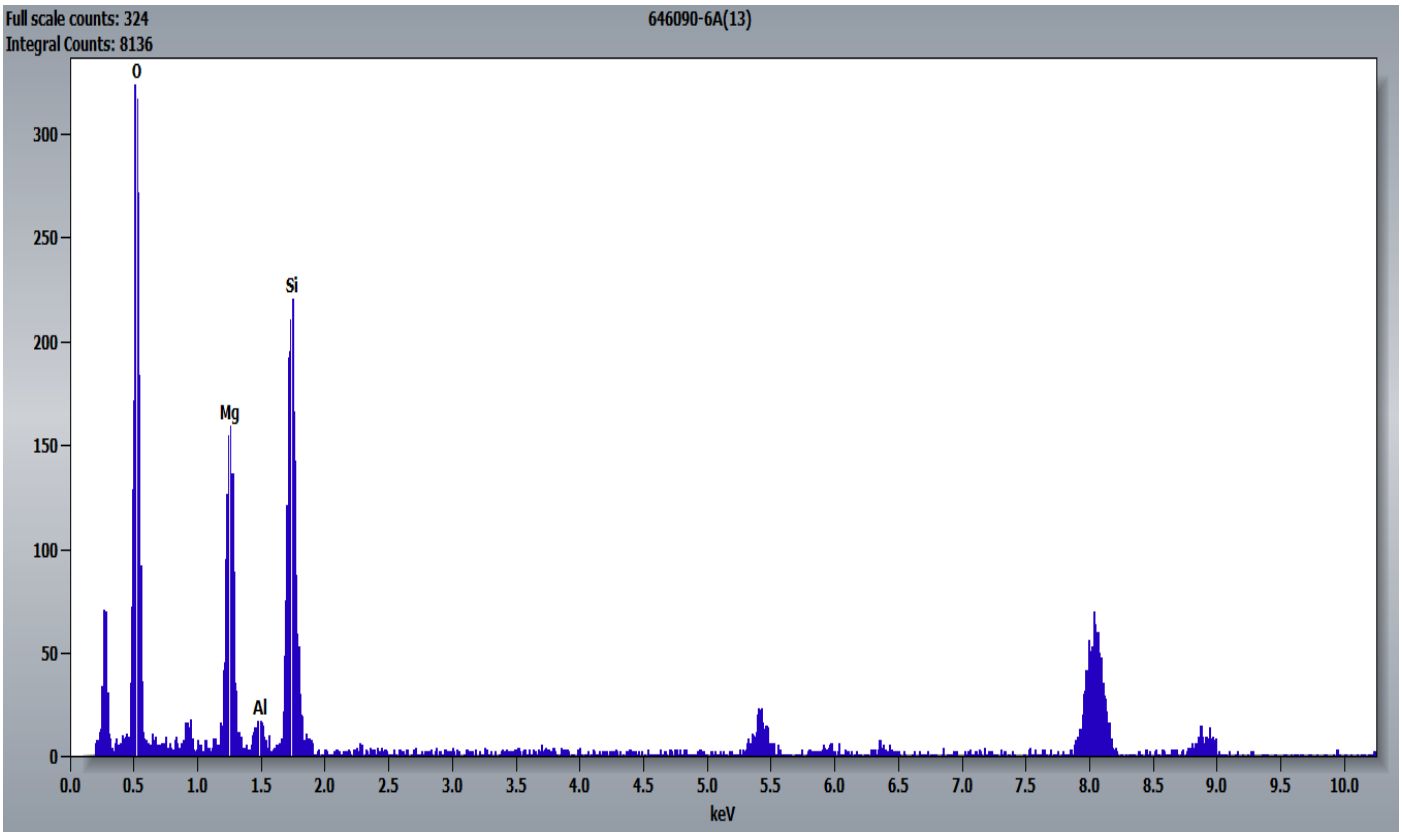


646090 FDA_073.jpg
646090-6A
Talc Ribbon

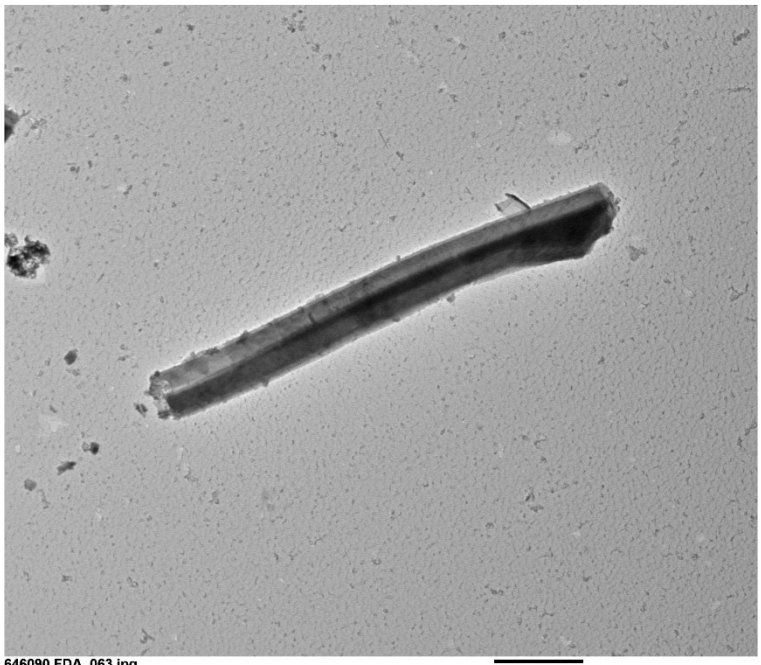
Cal: 0.001905 µm/pix
12:22 2023-06-08
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Talc Ribbon Pictured Above



646090-6A Elongated Talc Particle

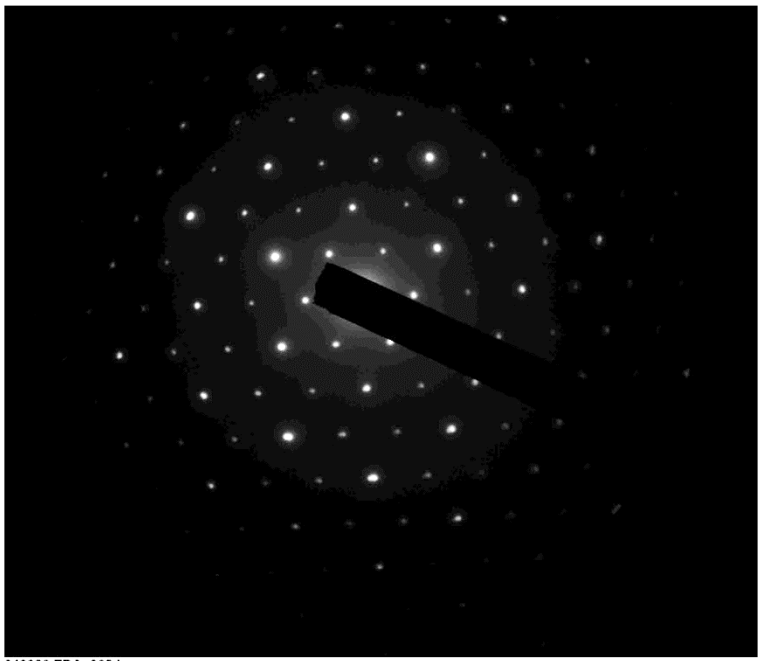


646090 FDA_063.jpg
646090-6A
Talc Fiber

Cal: 0.003183 µm/pix
11:20 2023-06-08
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 Elongated Talc Particle Pictured Above

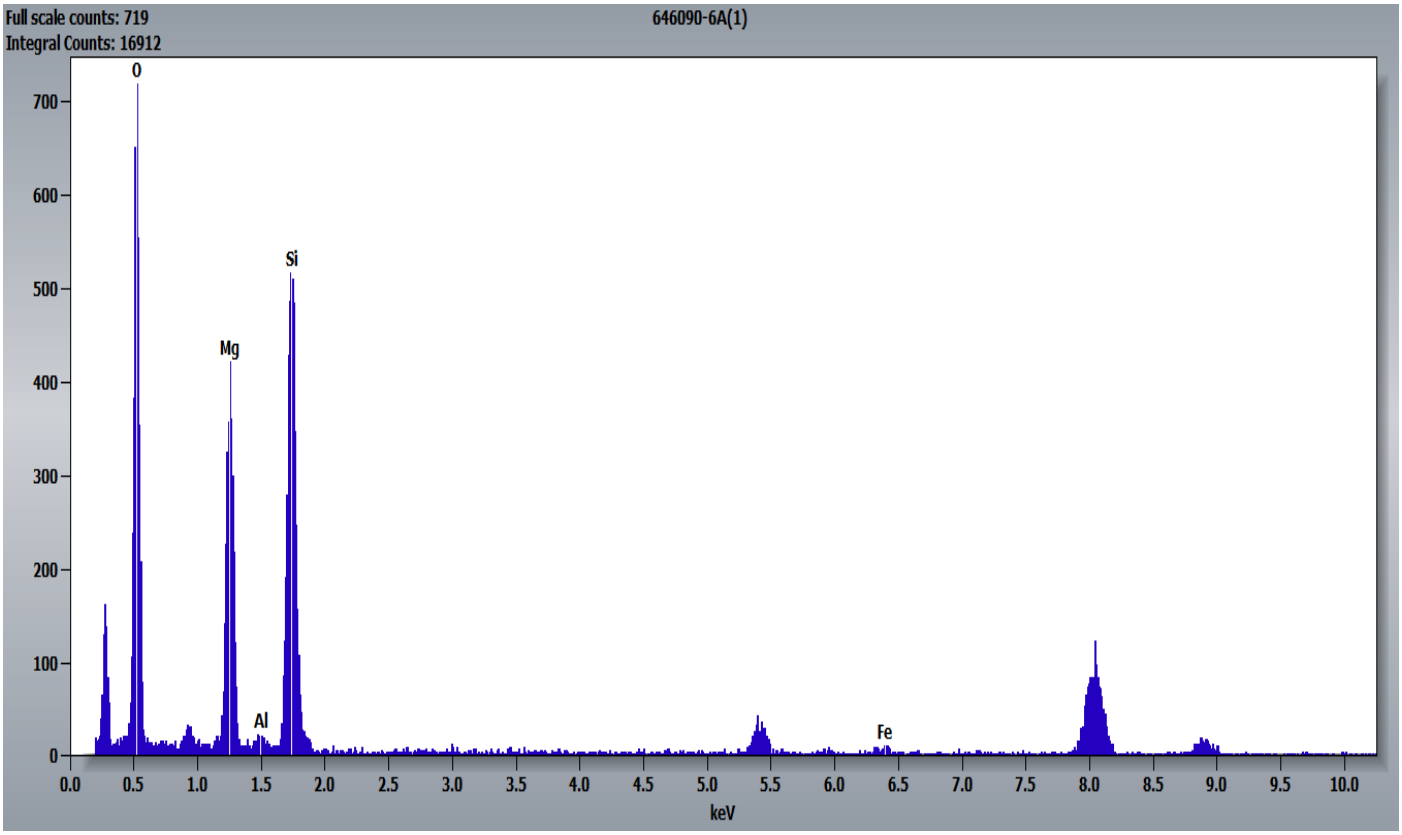


646090 FDA_062.jpg
646090-6A
Talc Fiber

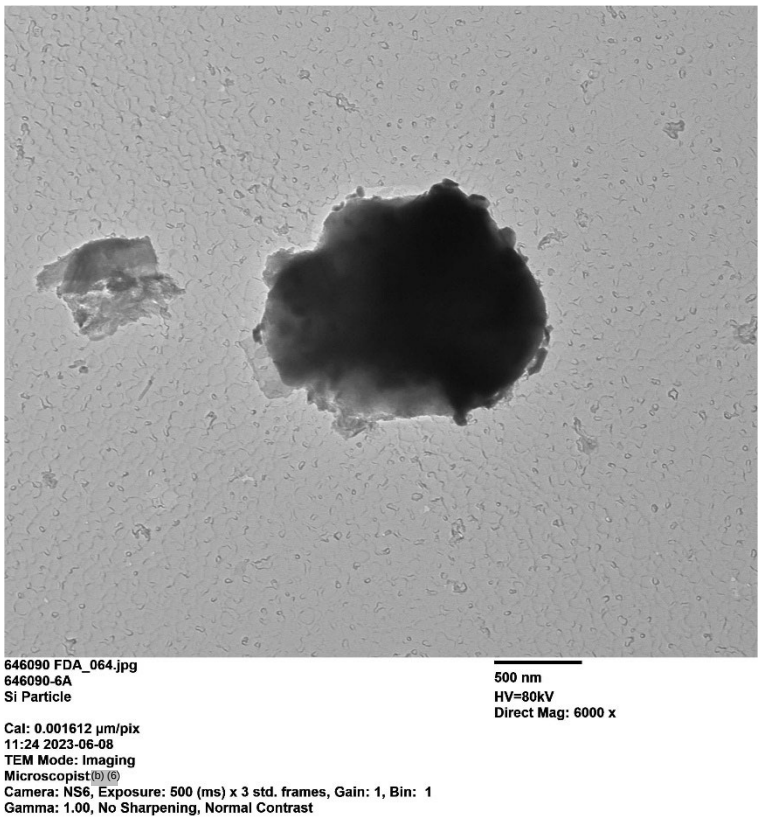
Cal: 0.000817 µm/pix
11:19 2023-06-08
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

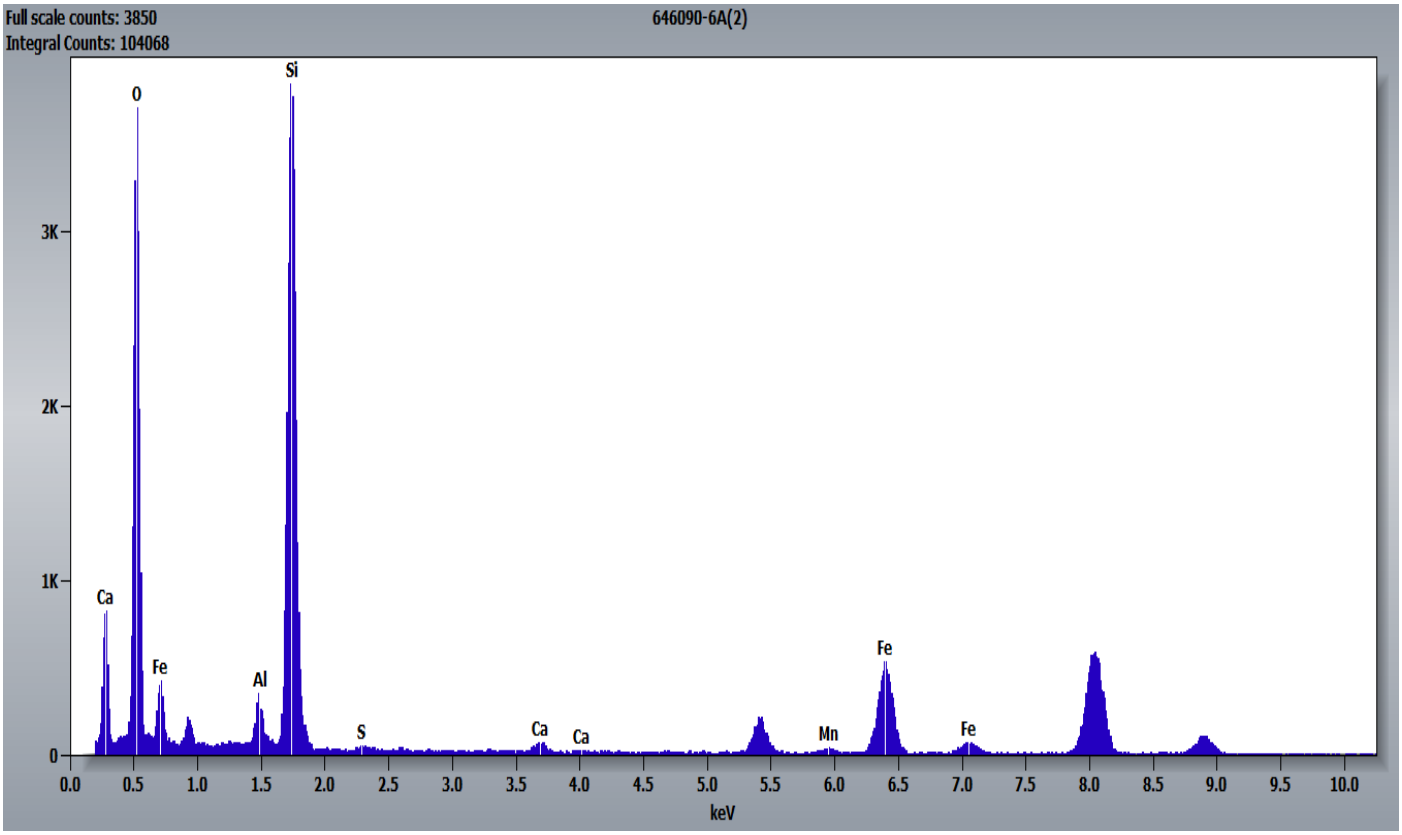
Chemistry from the Elongated Talc Particle Pictured Above



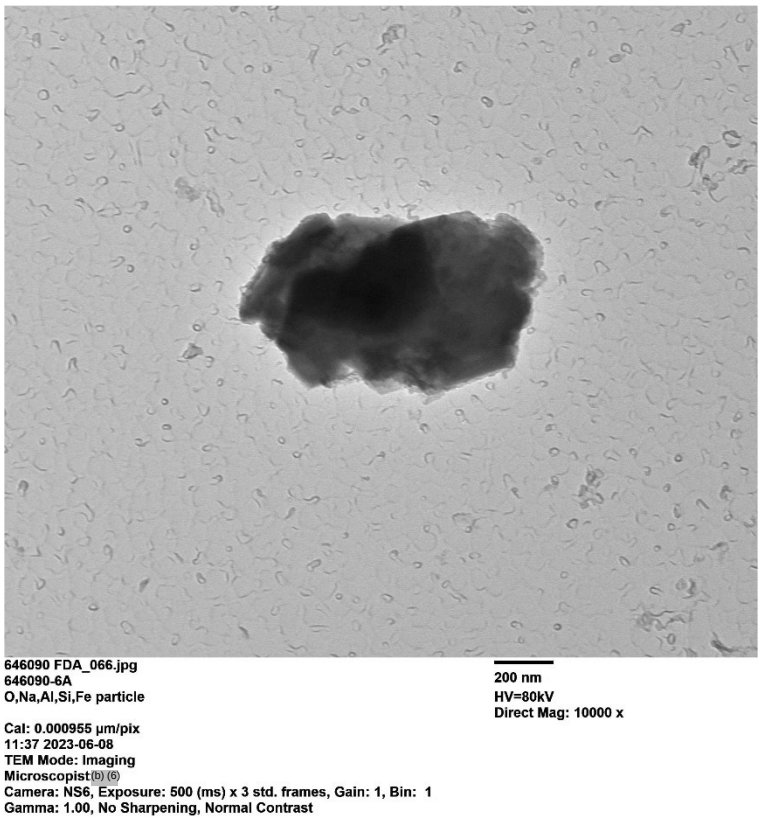
646090-6A Silicon Particle



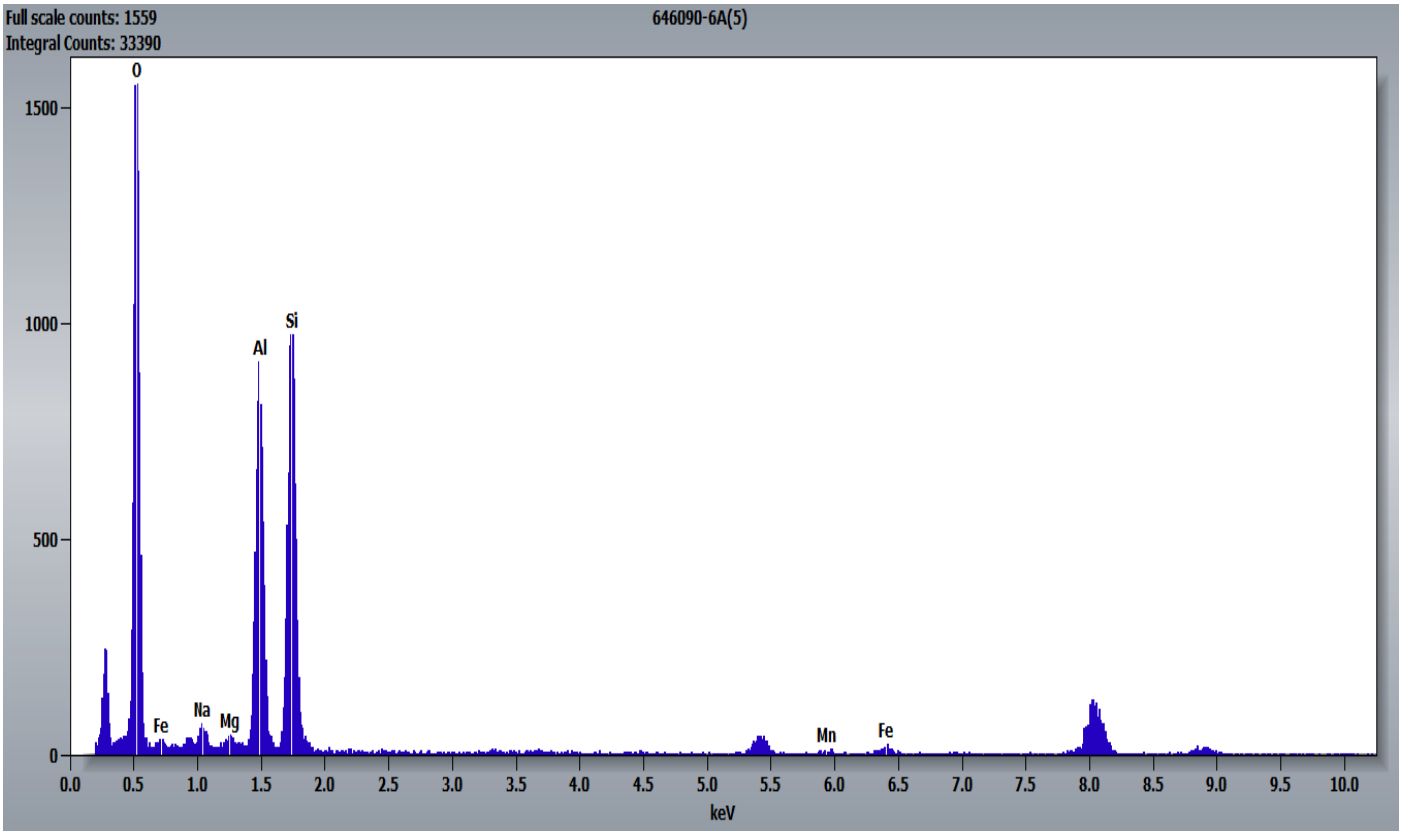
Chemistry from the Silicon Particle Pictured Above



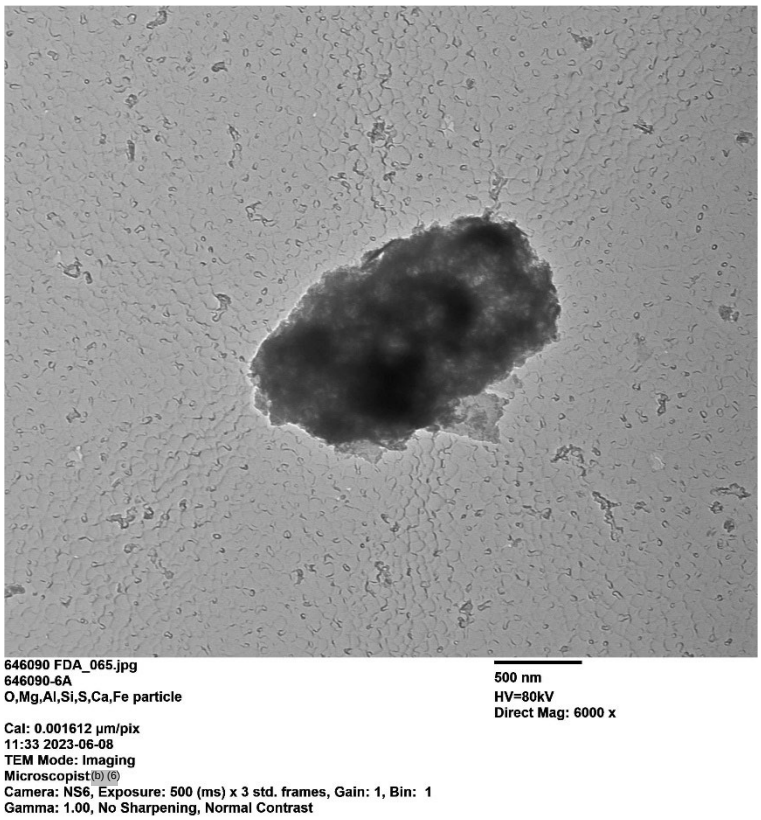
646090-6A Particle Containing Sodium, Aluminum, Silicon, and Iron



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

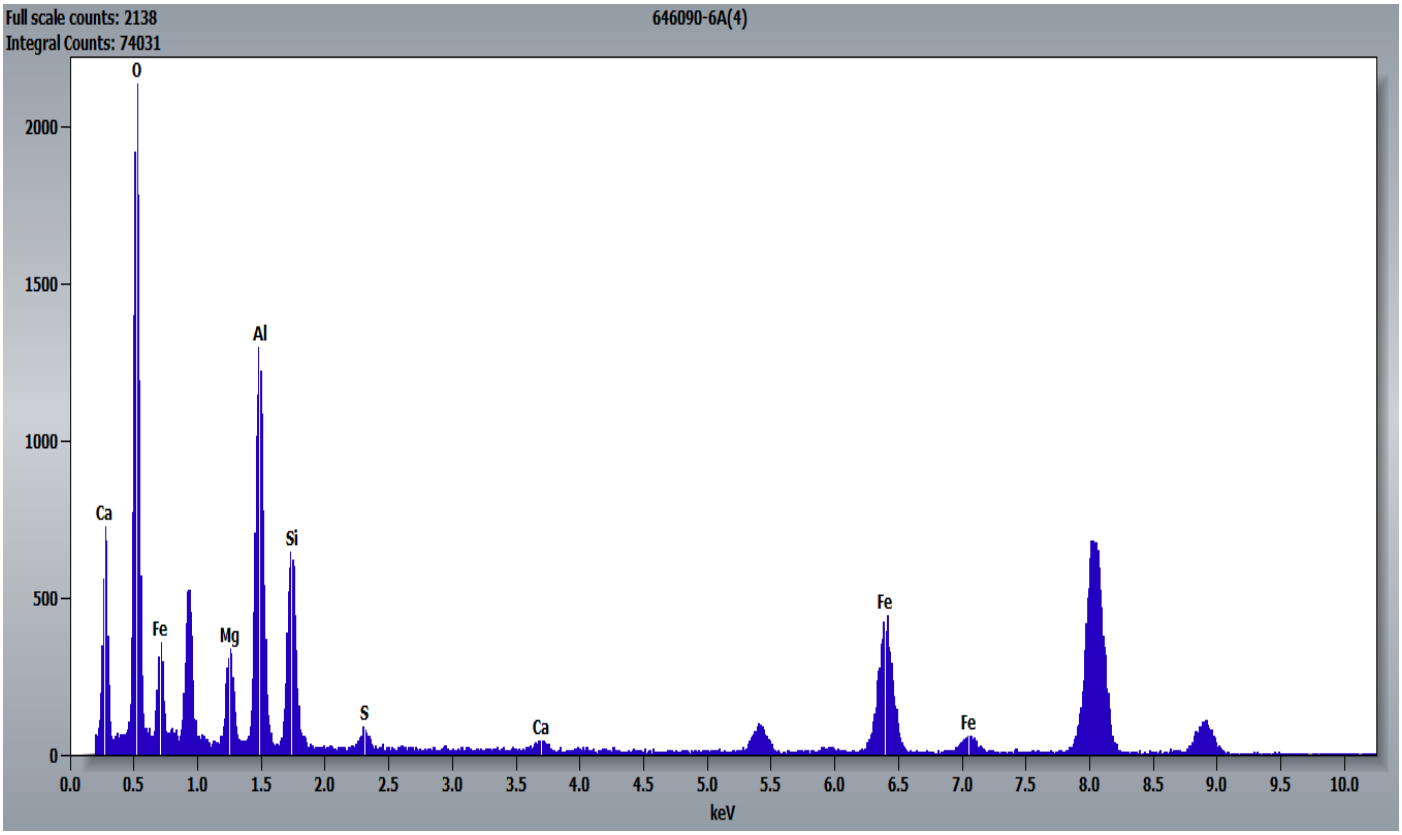


646090-6A Particle Containing Magnesium, Aluminum, Silicon, Calcium, and Iron

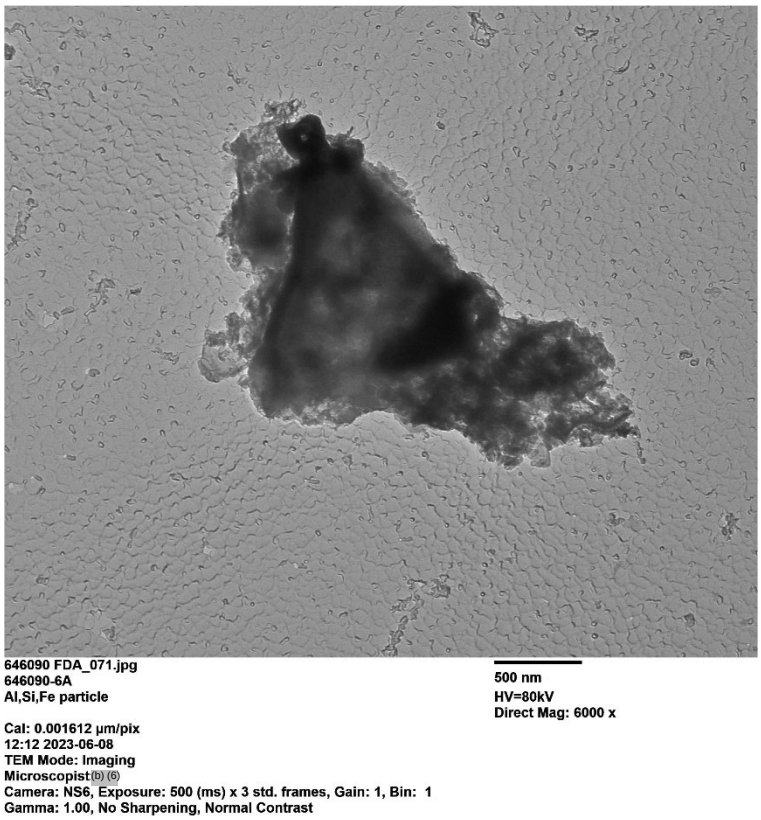


Chemistry from the Particle Containing Magnesium, Aluminum, Silicon, Calcium, and Iron Pictured Above

Asbestos · Lead · Mold · Nano

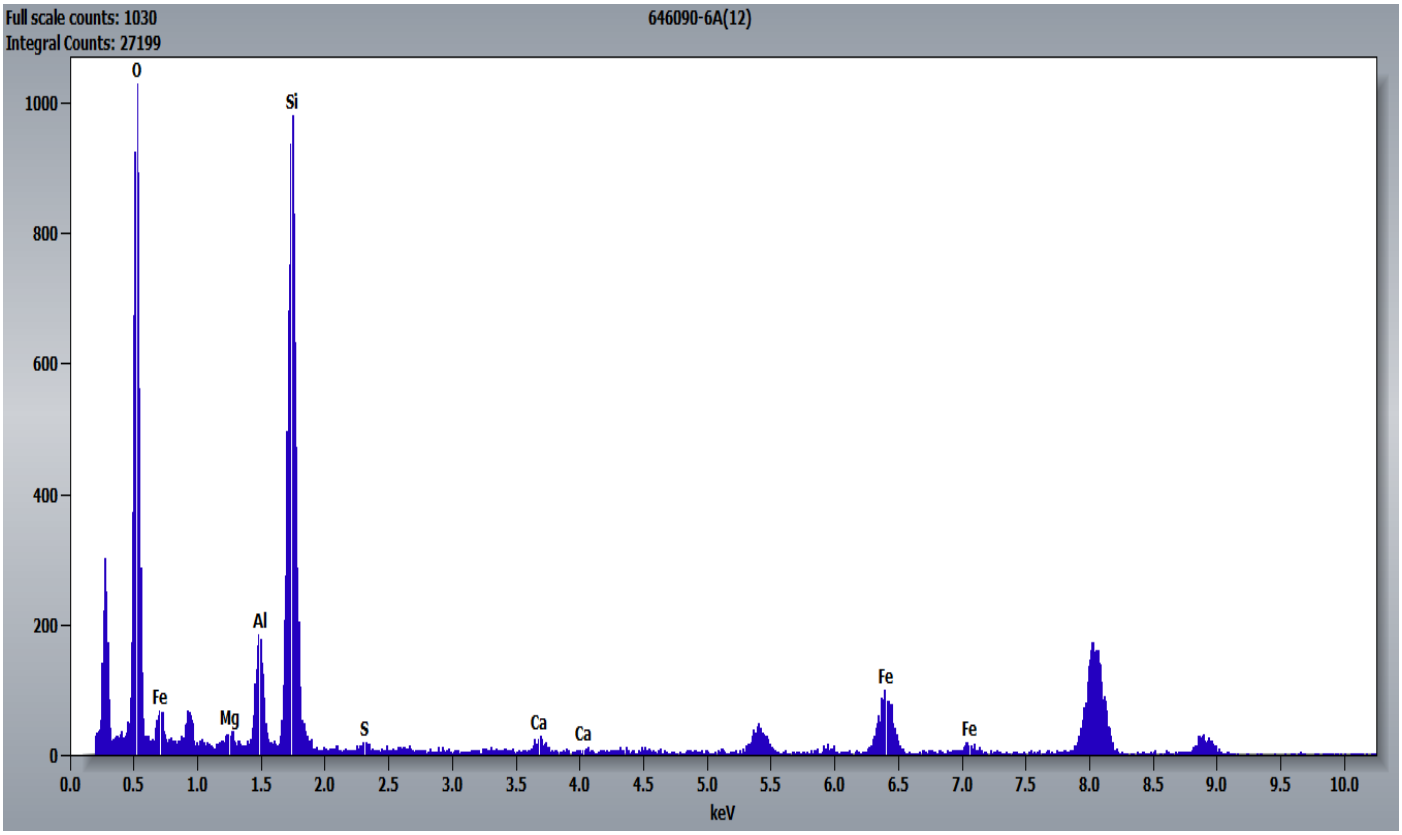


646090-6A Particle Containing Aluminum, Silicon, and Iron

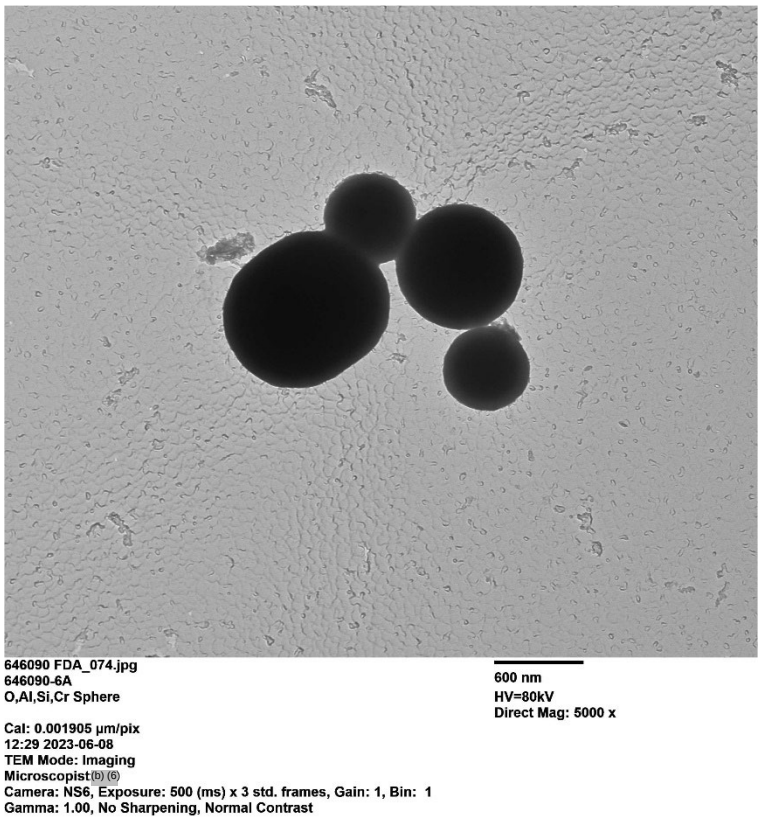


Chemistry from the Particle Containing Aluminum, Silicon, and Iron Pictured Above

Asbestos · Lead · Mold · Nano

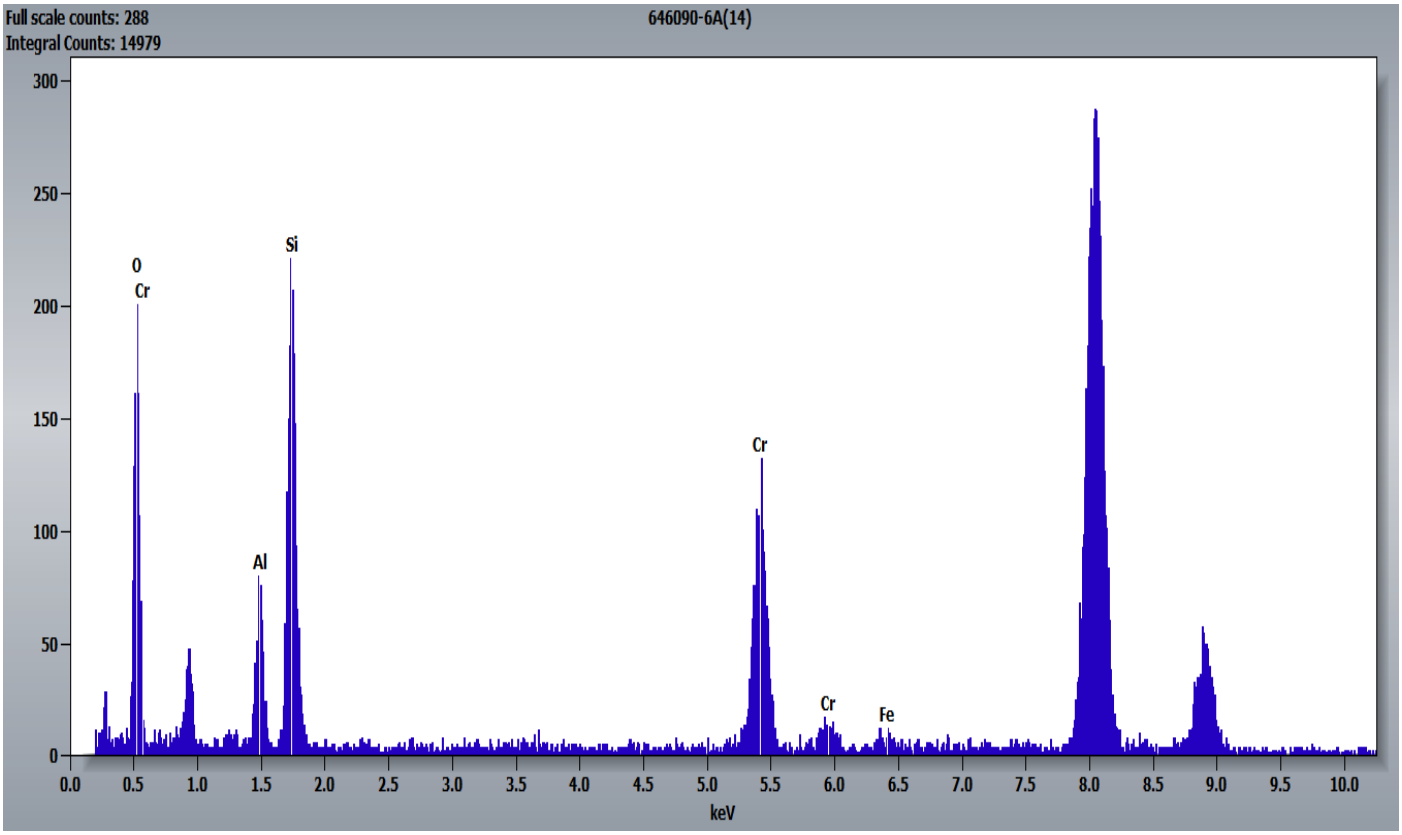


646090-6A Silica Spheres with Aluminum and Chromium

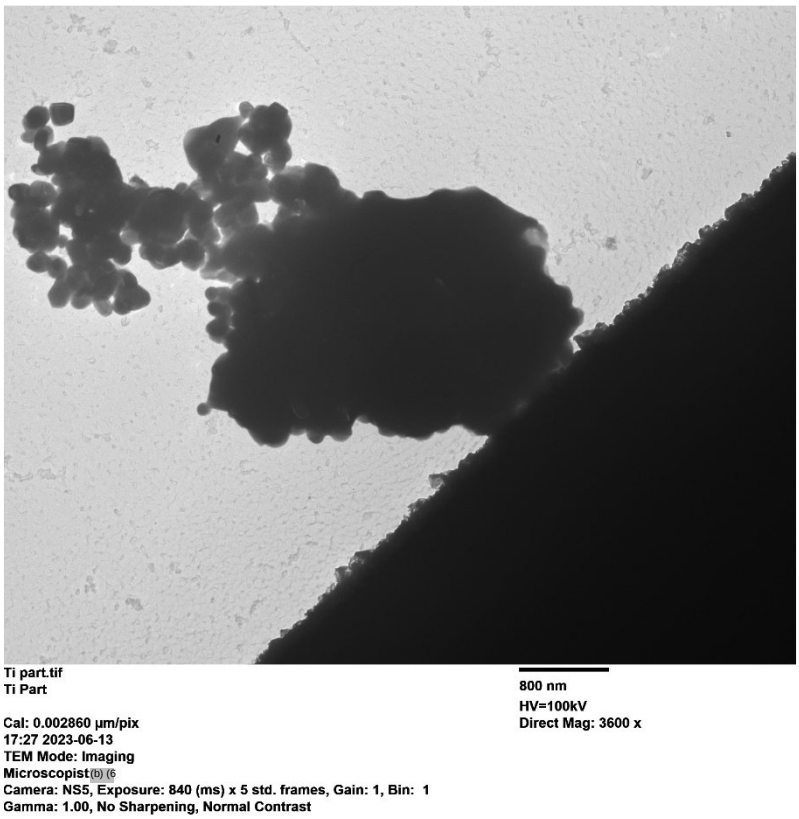


Chemistry from the Silica Spheres with Aluminum and Chromium Pictured Above

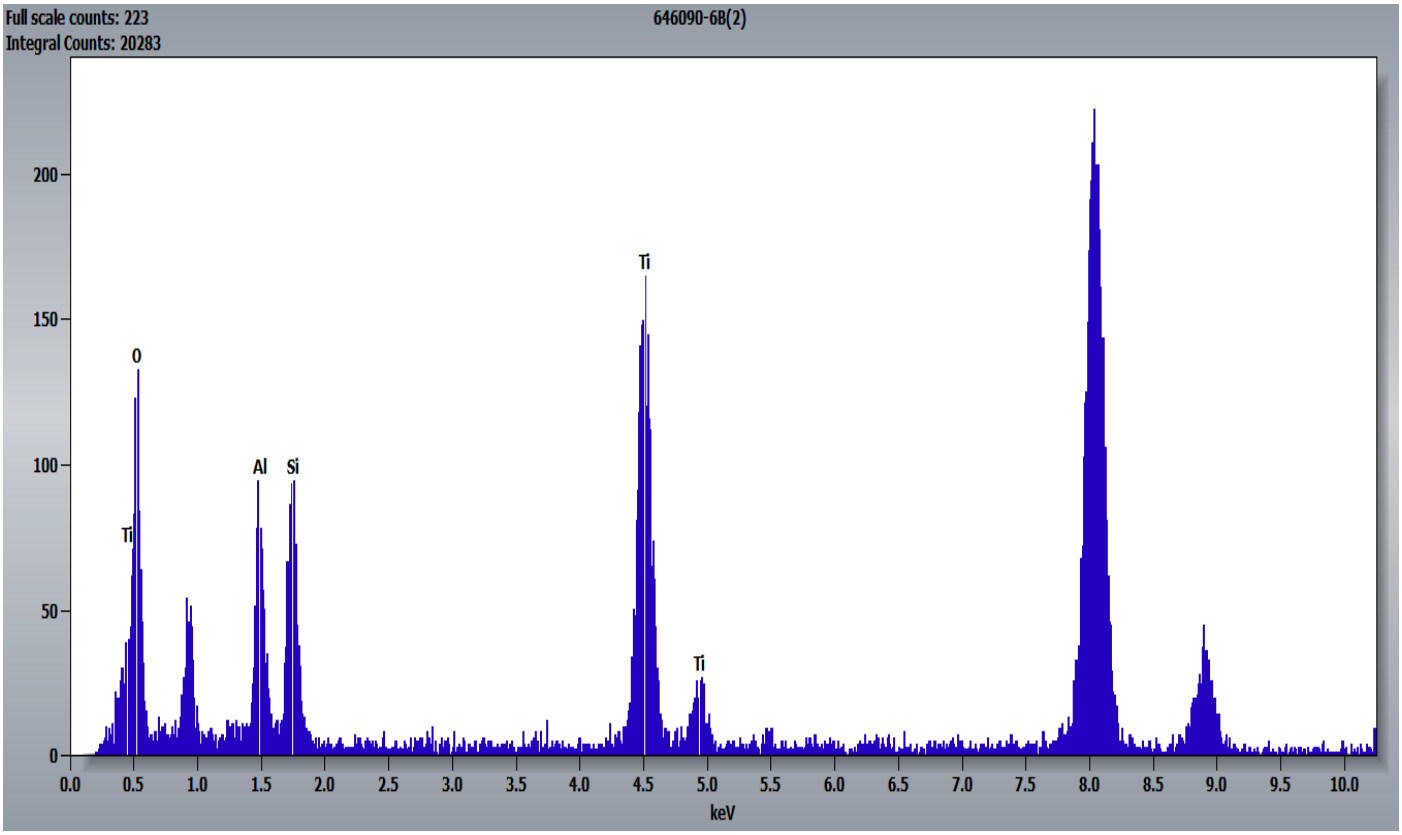
Asbestos · Lead · Mold · Nano



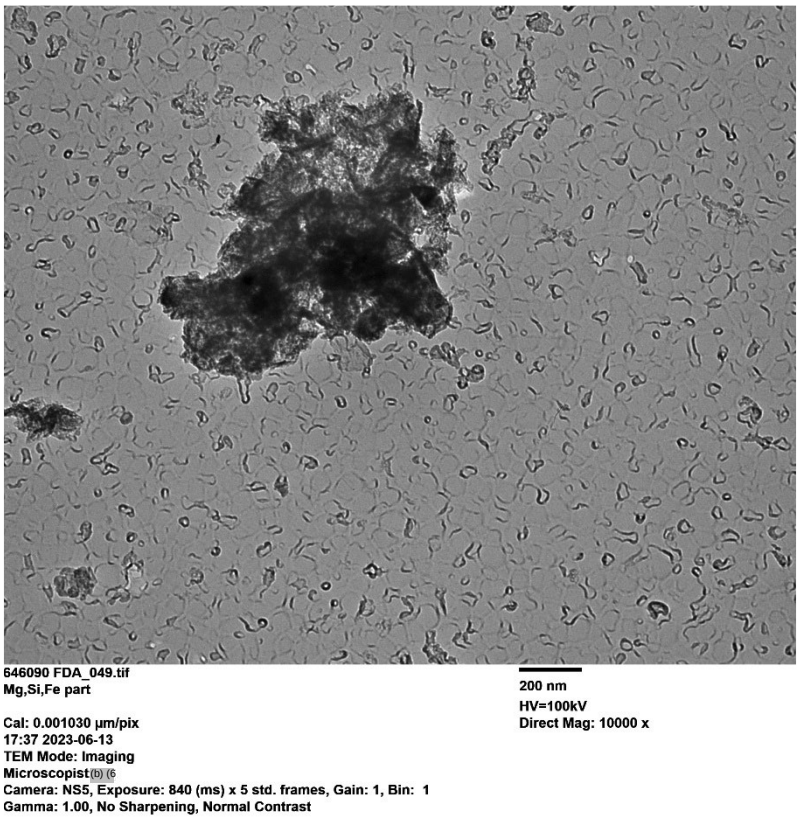
646090-6B, Particle Containing Aluminum, Silicon, and Titanium



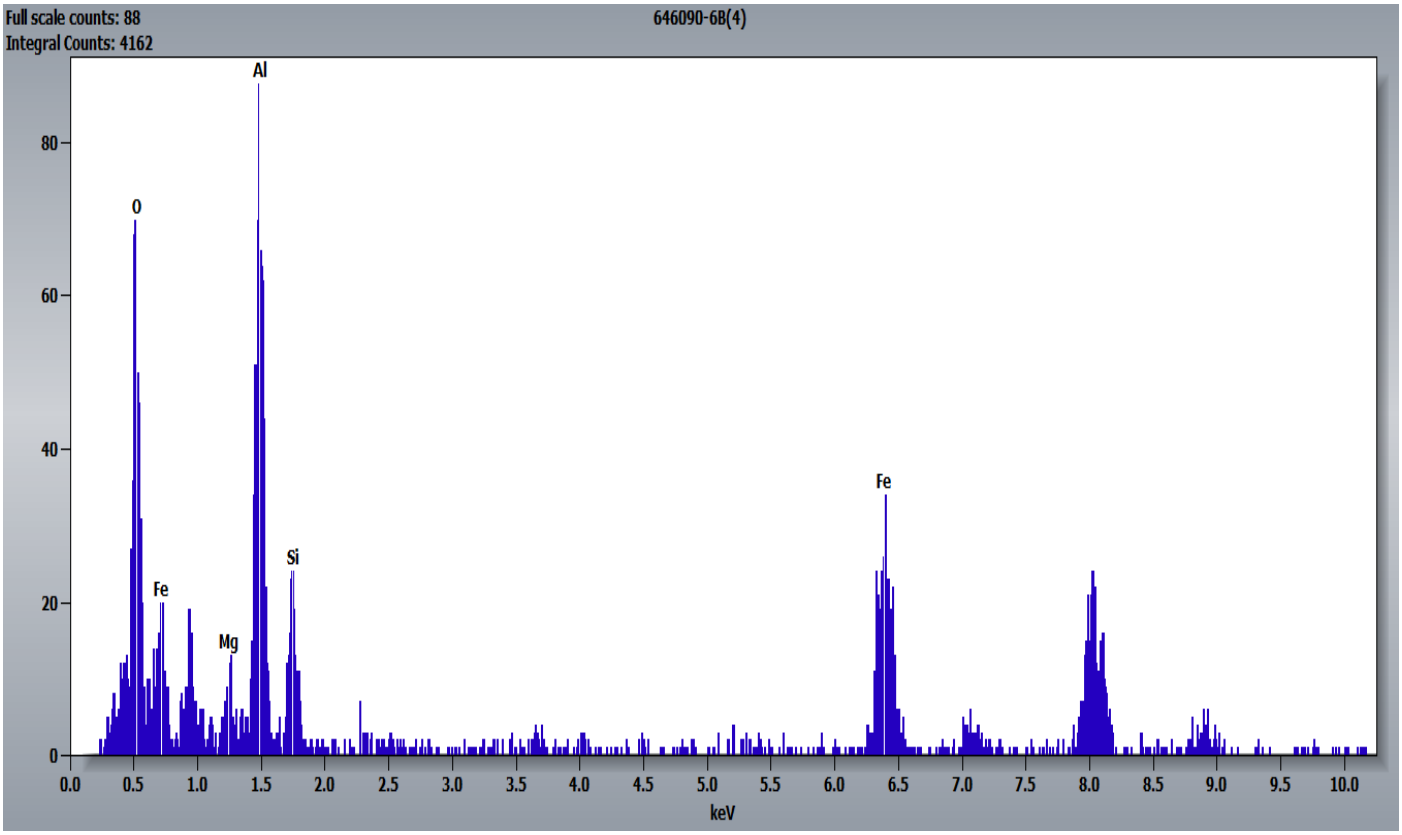
Chemistry from the Particle Containing Aluminum, Silicon, and Titanium Pictured Above



646090-6B, Particle Containing Magnesium, Aluminum, Silicon, and Iron



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



646090-7A, 7B, 7C/Client Sample: 04032023-7

PLM

All three aliquots of sample 04032023-7 were analyzed by (b) (6) on June 9, 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.

646090-7A	No Asbestos Detected
646090-7B	No Asbestos Detected
646090-7C	No Asbestos Detected

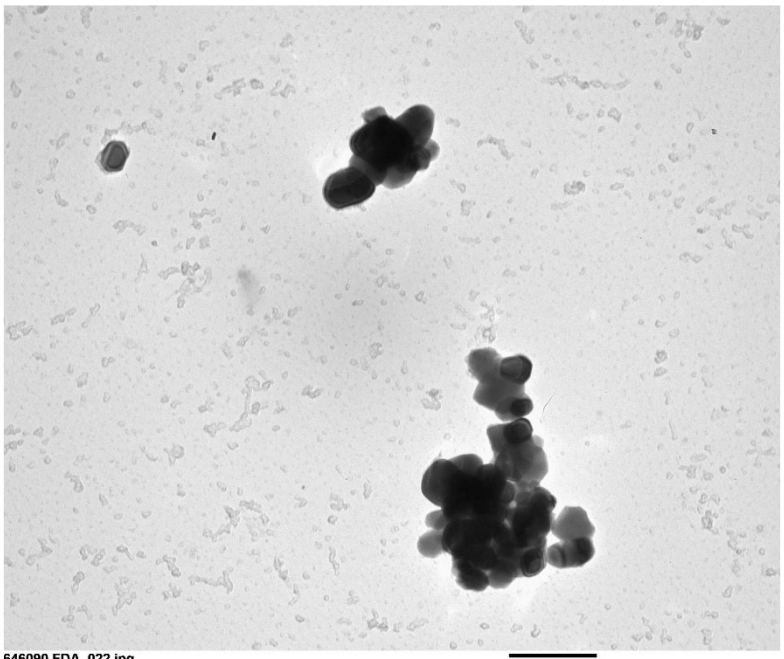
TEM

(b) (6) analyzed aliquot 7A on June 12, 2023. (b) (6) analyzed aliquot 7B and June 12, 2023 and (b) (6) analyzed aliquot 7C on June 12, 2023. The primary particle observed was titanium; mica and talc particles were also observed along with talc ribbons/fibers, iron particles, 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.

646090-7A	No Asbestos Detected
646090-7B	No Asbestos Detected
646090-7C	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.

646090-7A, Titanium Particles



646090 FDA_022.jpg
646090-7A
Ti Particles

Cal: 0.001430 µm/pix
17:20 2023-06-12
TEM Mode: Imaging
Microscopist(b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x

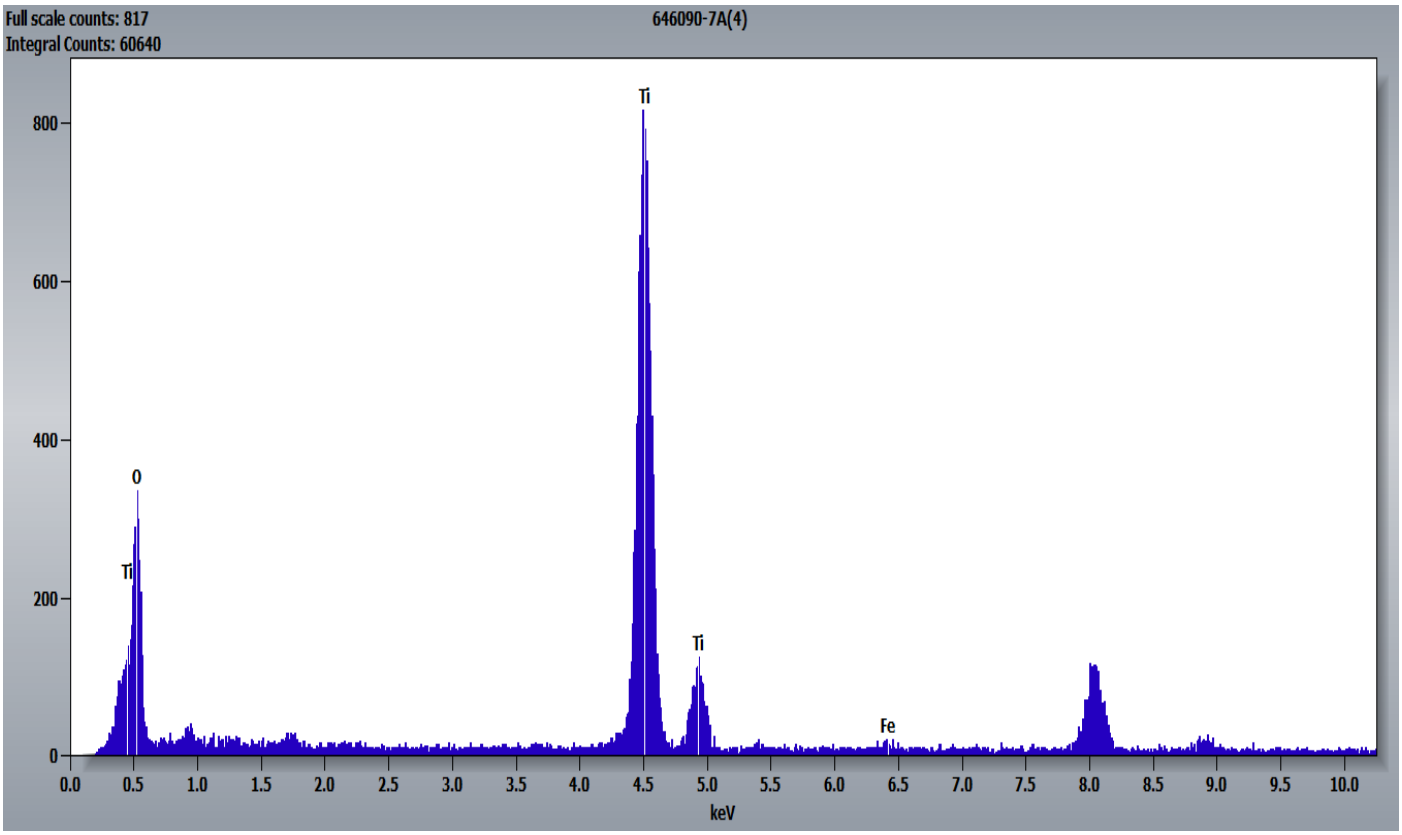
Diffraction Pattern from the Titanium Particles Pictured Above

646090 FDA_021.jpg
646090-7A
Ti Particles

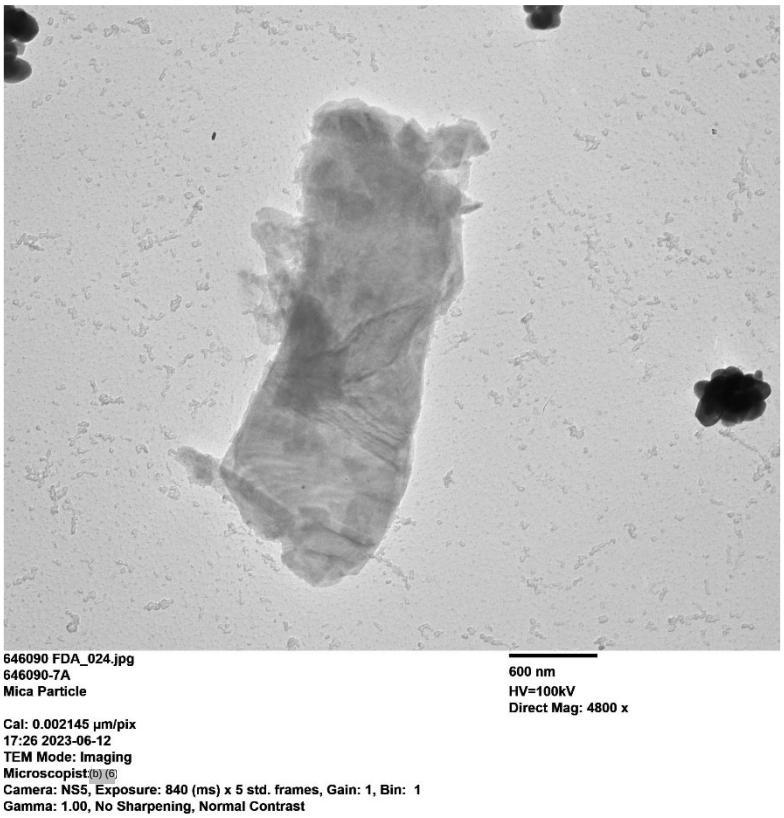
17:18 2023-06-12
TEM Mode: Diffraction
Microscopist(b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Titanium Particles Pictured Above

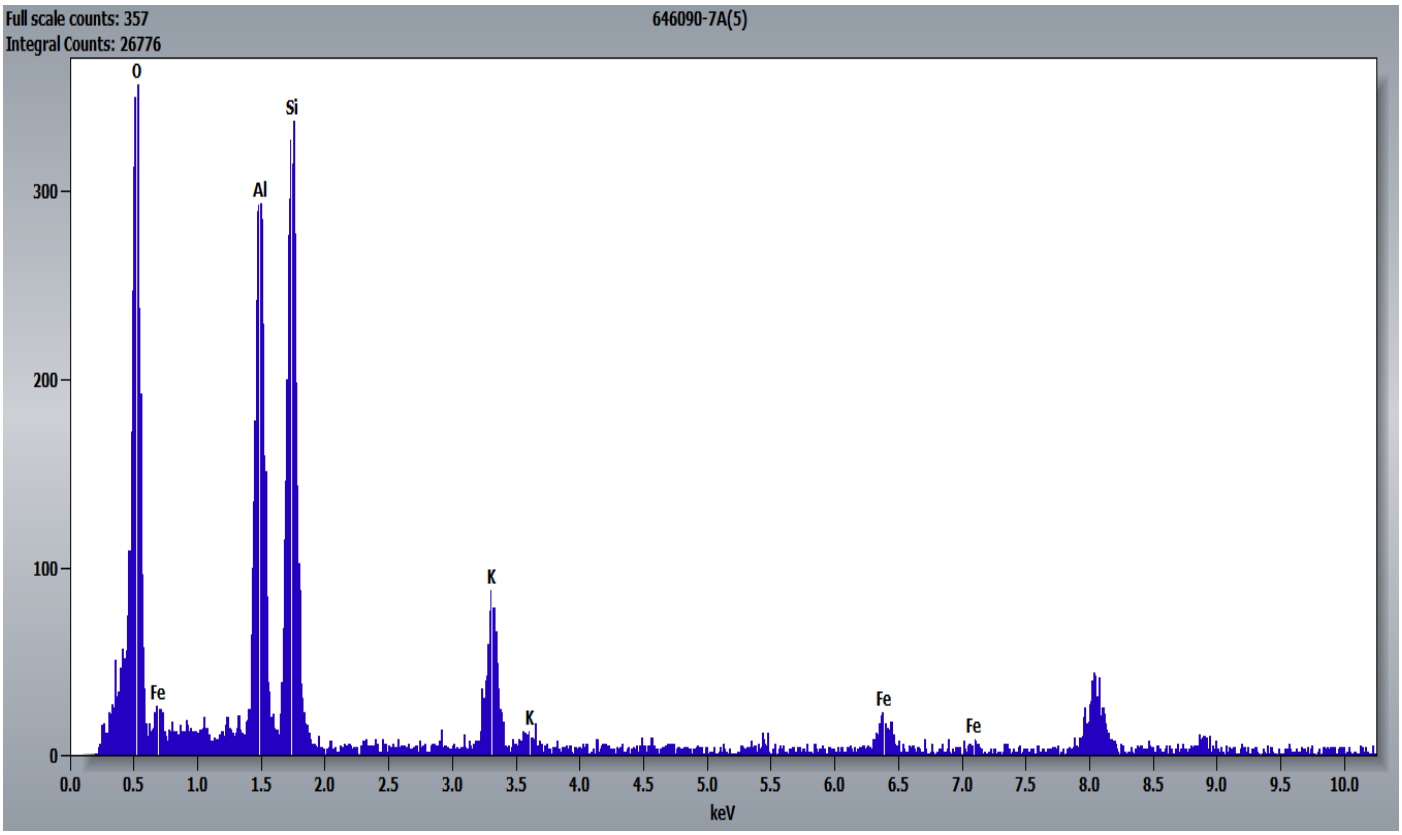


646090-7A, Mica Particle

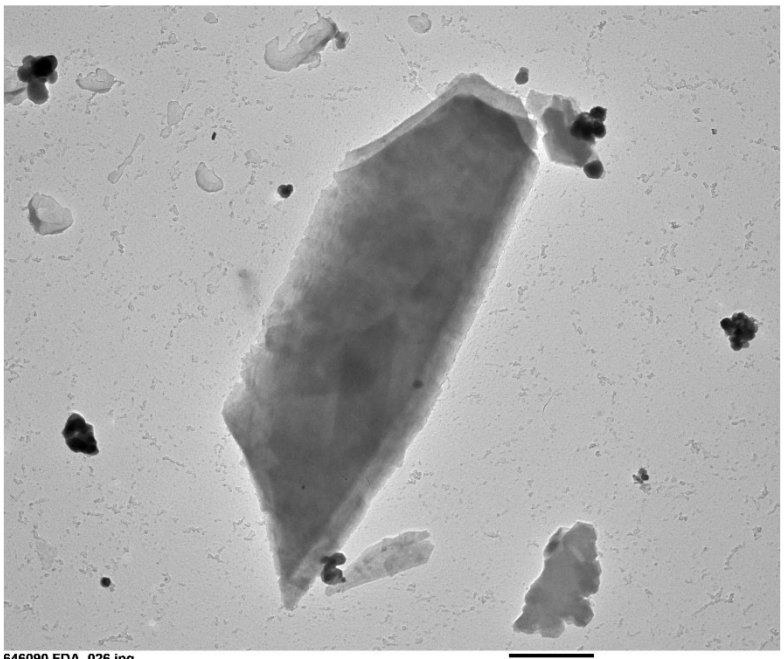


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

Chemistry from the Mica Particle Pictured Above



646090-7A, Talc Particle

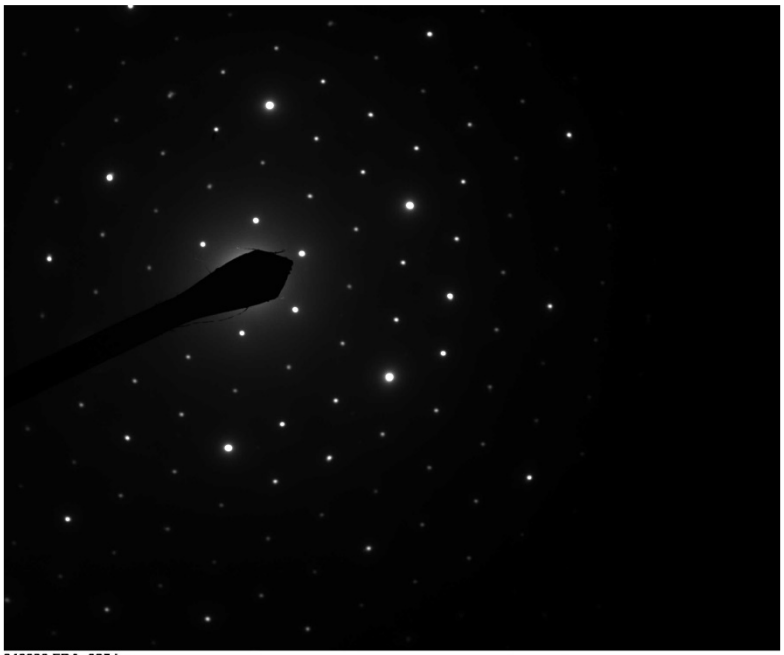


646090 FDA_026.jpg
646090-7A
Talc Particle

Cal: 0.003702 µm/pix
17:30 2023-06-12
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=100kV
Direct Mag: 2900 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

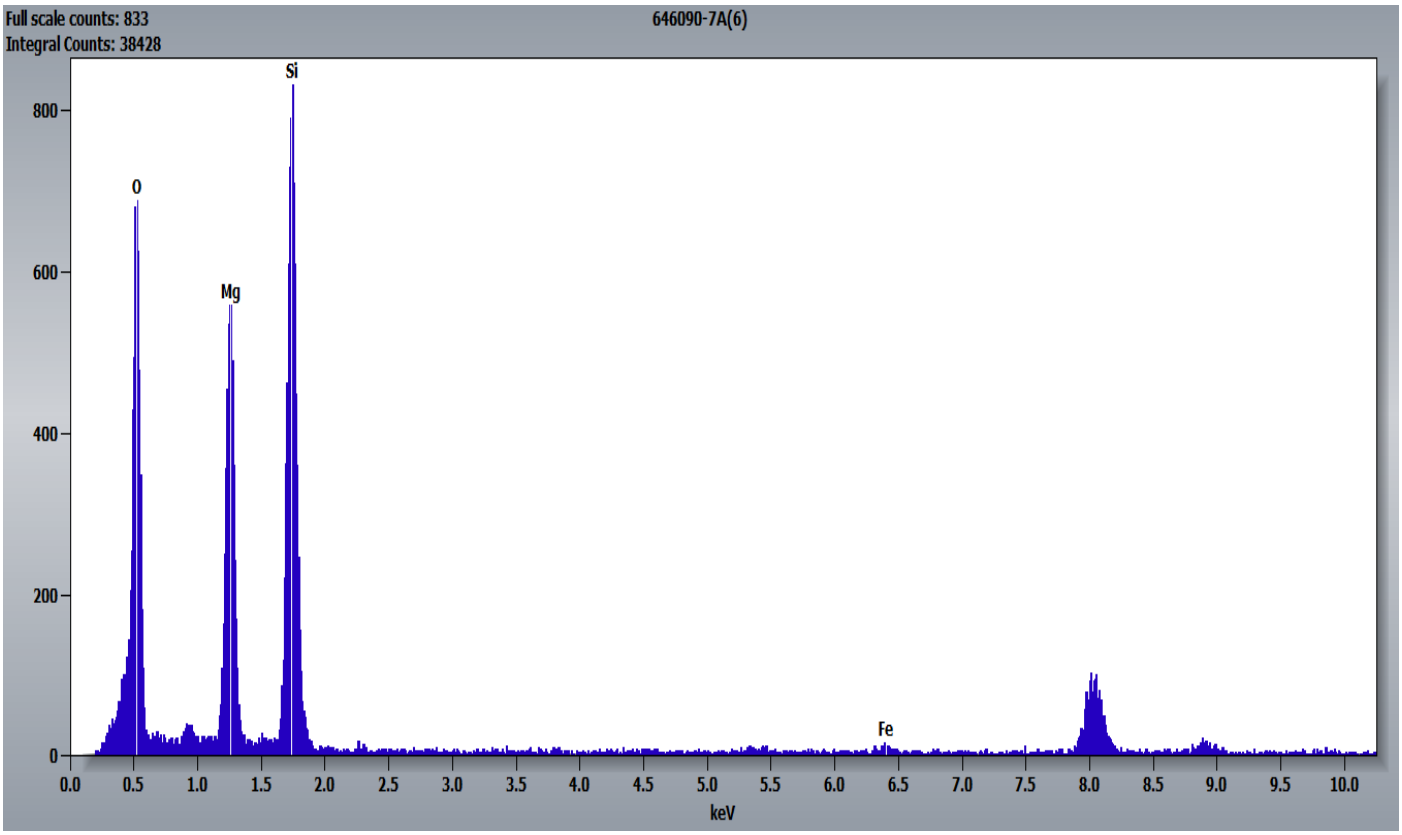


646090 FDA_025.jpg
646090-7A
Talc Particle

Cal: 0.002145 µm/pix
17:30 2023-06-12
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

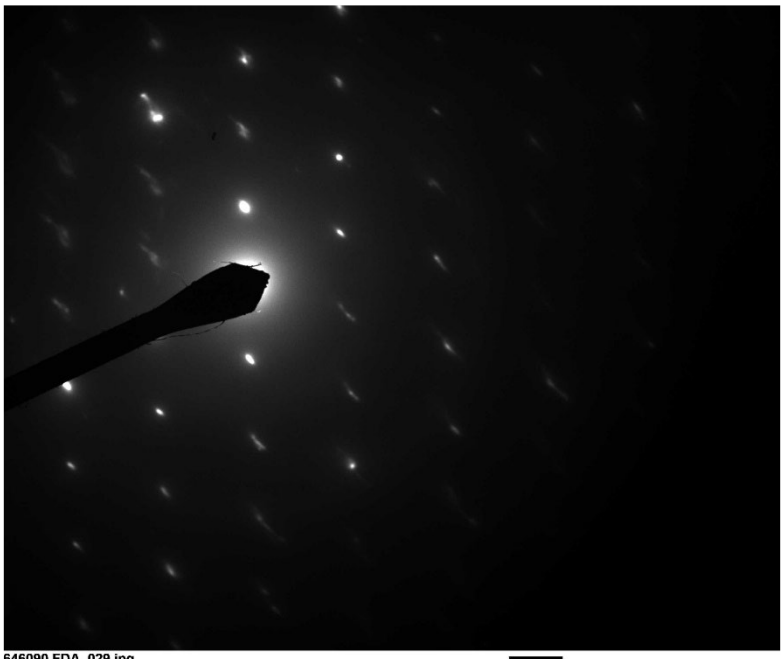
0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Talc Particle Pictured Above

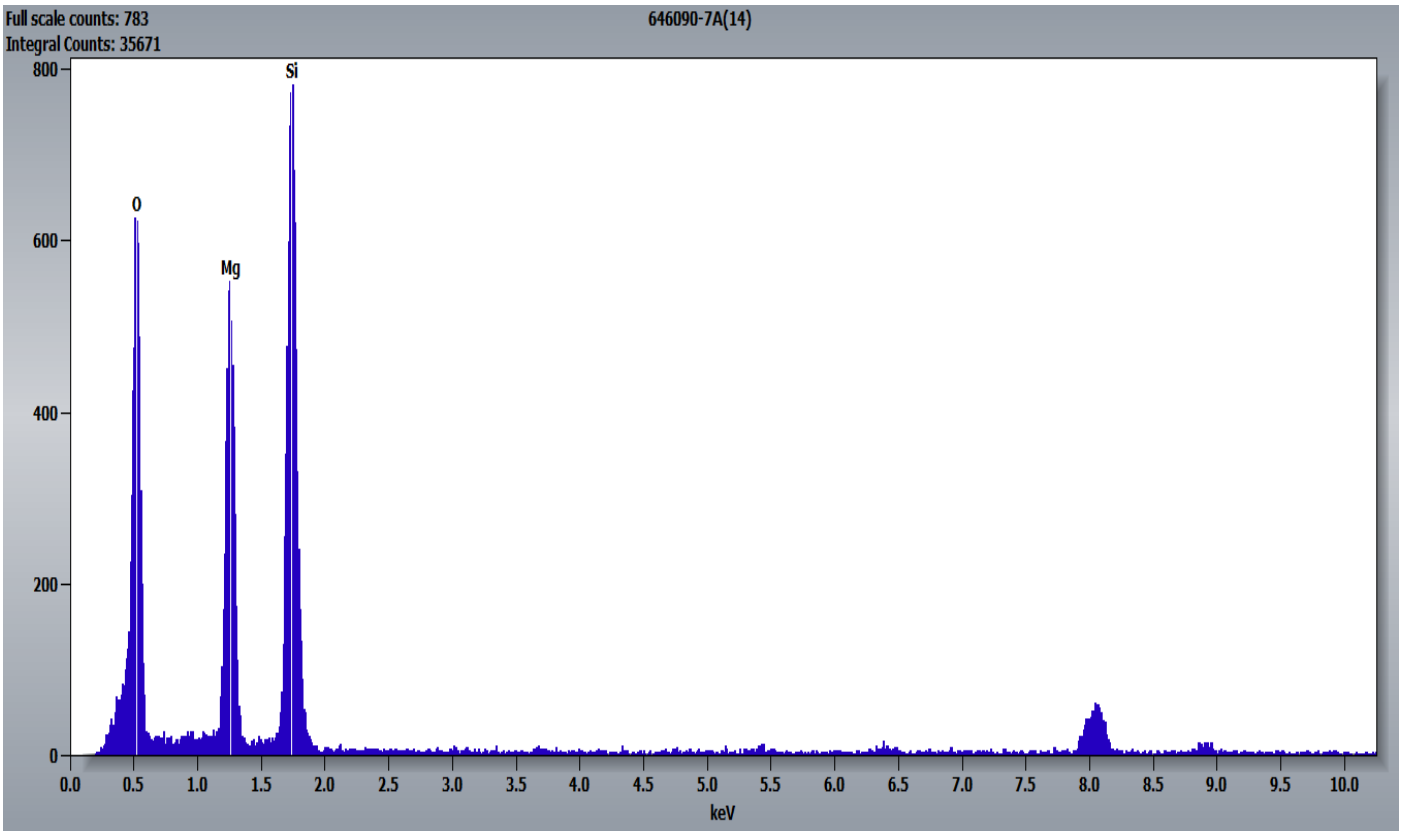


646090-7A, Talc Ribbon

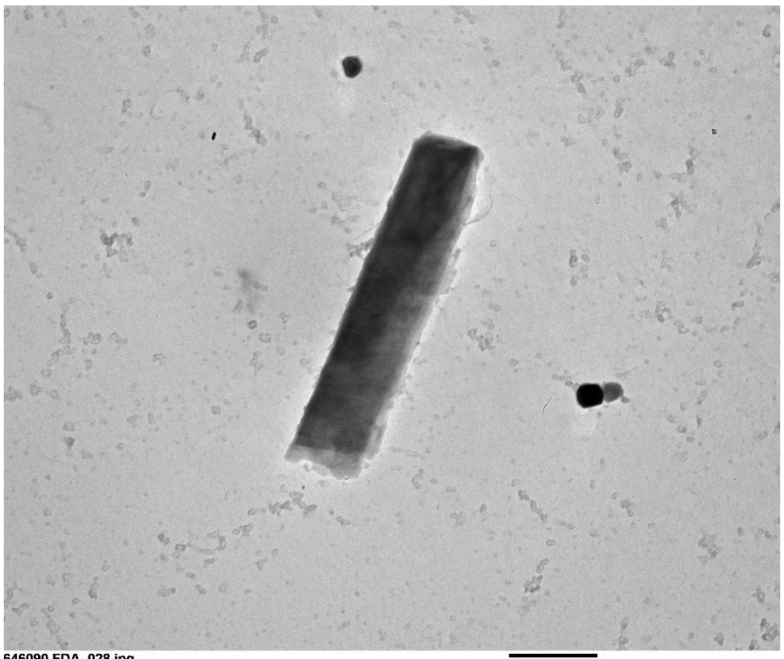
Diffraction Pattern from the Talc Ribbon Pictured Above



Chemistry from the Talc Ribbon Pictured Above



646090-7A, Elongated Talc Particle

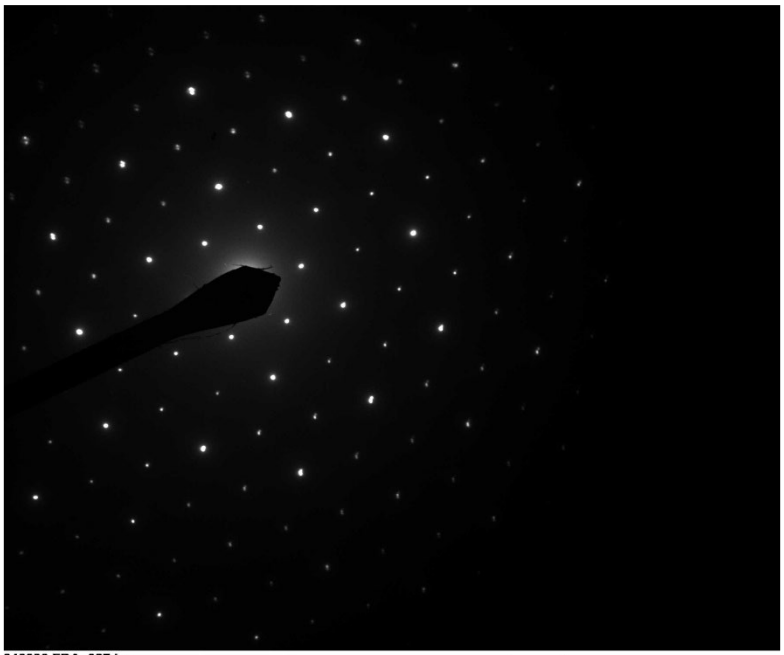


646090 FDA_028.jpg
646090-7A
Talc Fiber

Cal: 0.001775 µm/pix
17:48 2023-06-12
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

500 nm
HV=100kV
Direct Mag: 5800 x

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

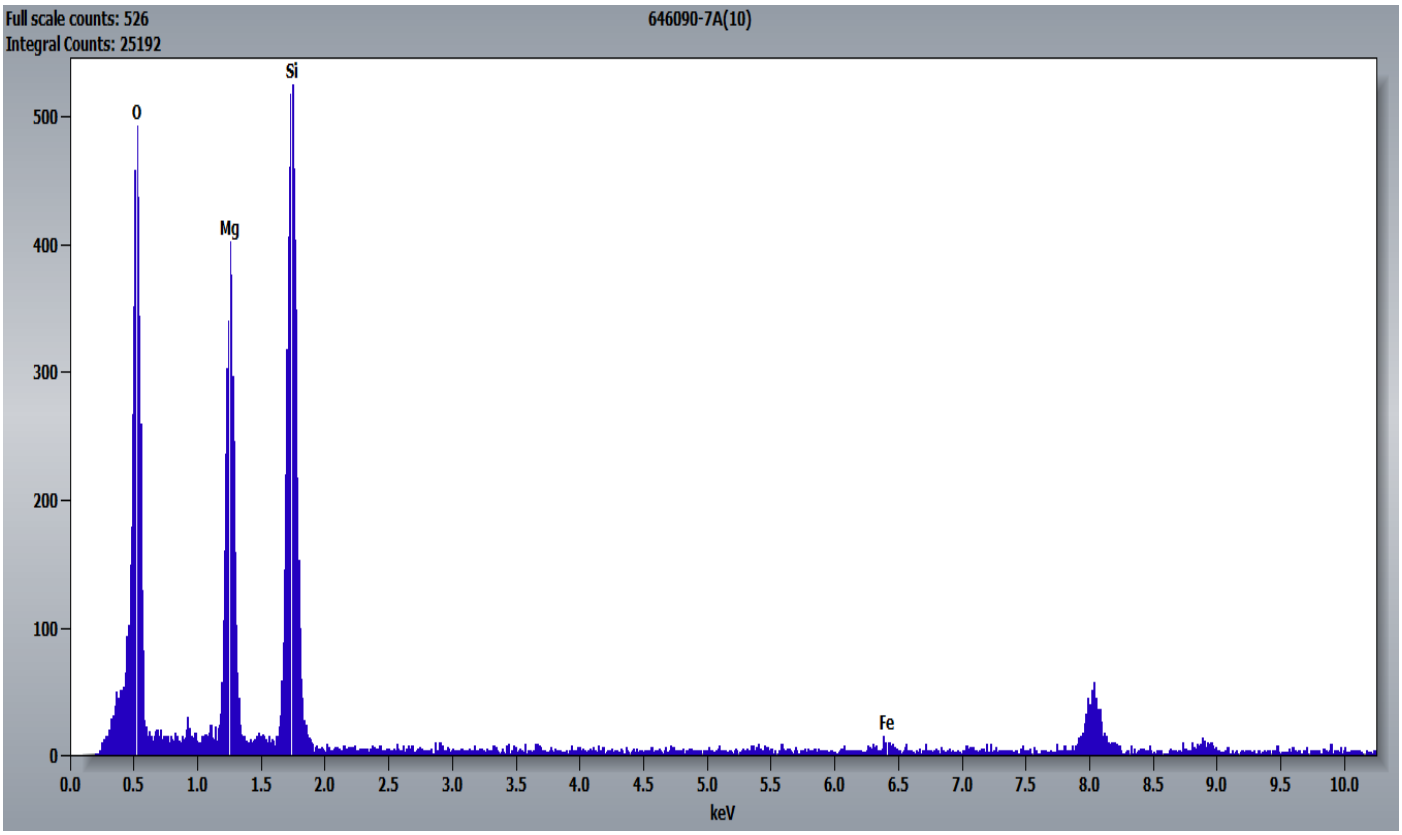


646090 FDA_027.jpg
646090-7A
Talc Fiber

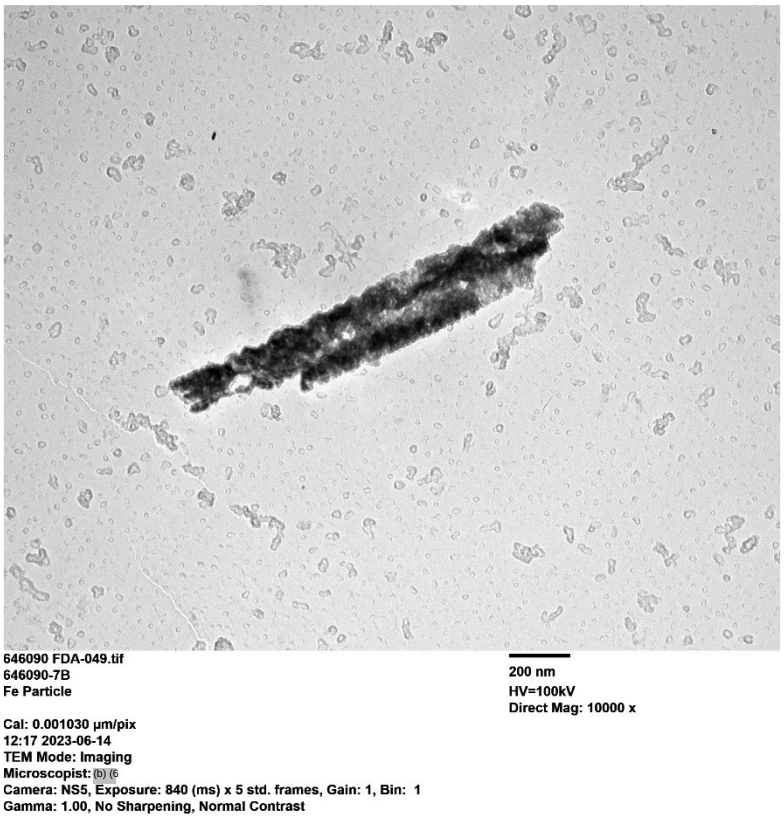
Cal: 0.003702 µm/pix
17:47 2023-06-12
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

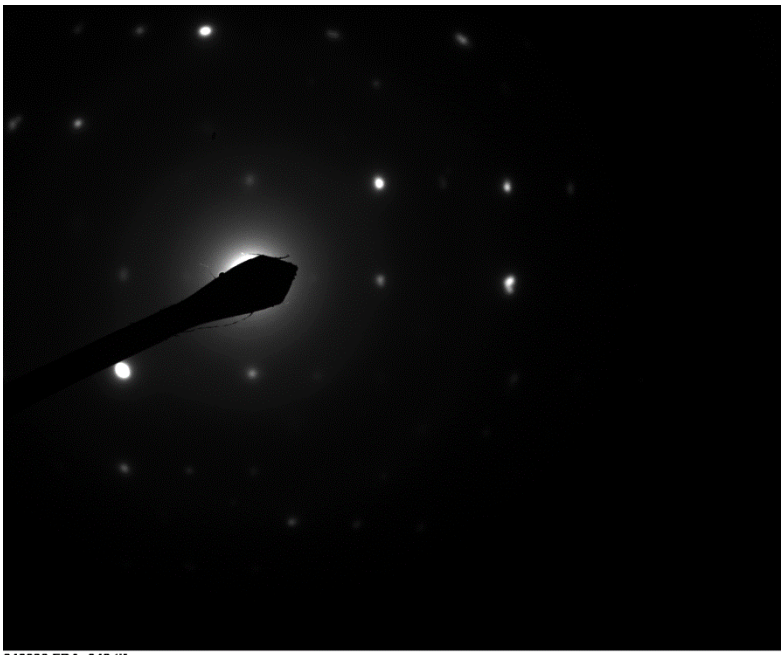
Chemistry from the Elongated Talc Particle Pictured Above



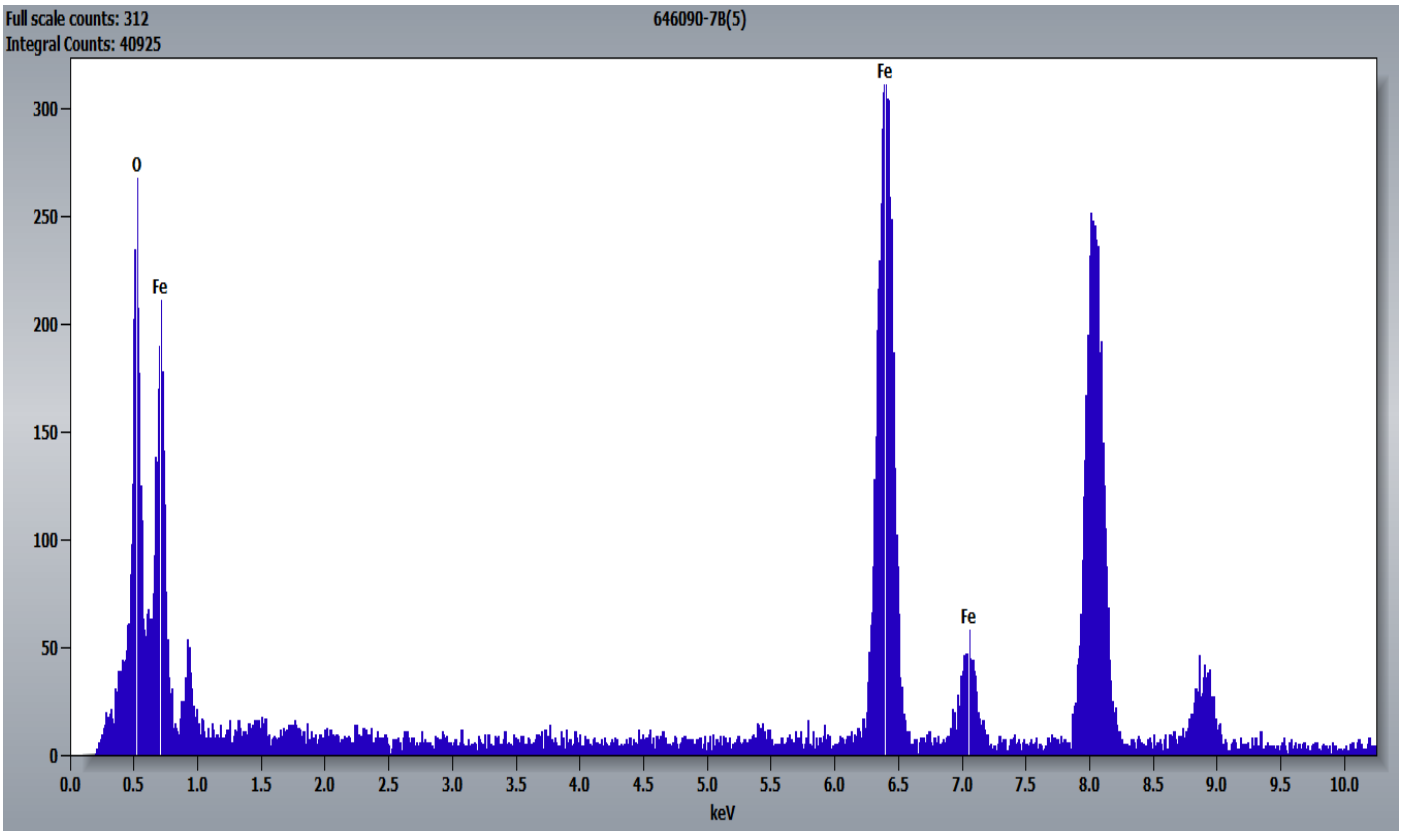
646090-7B, Iron Particle



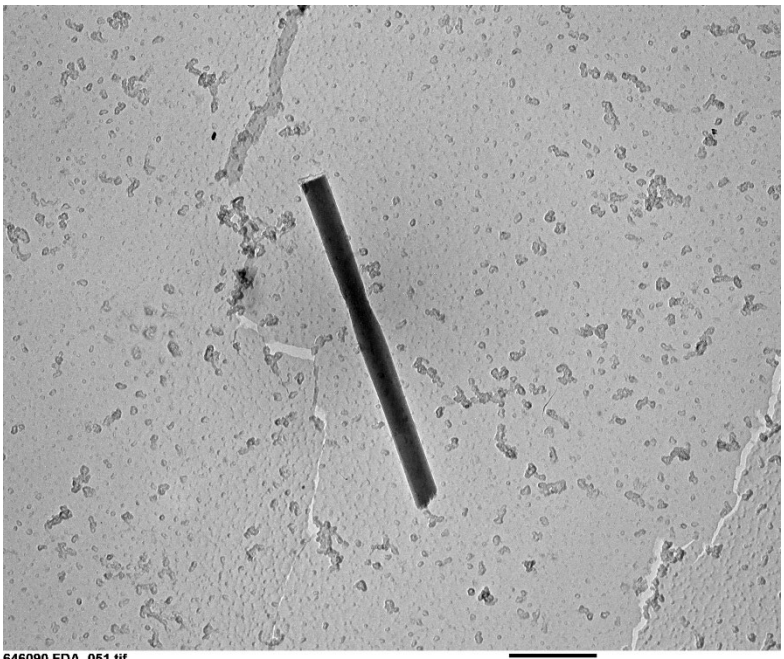
Diffraction Pattern from the Iron Particle Pictured Above



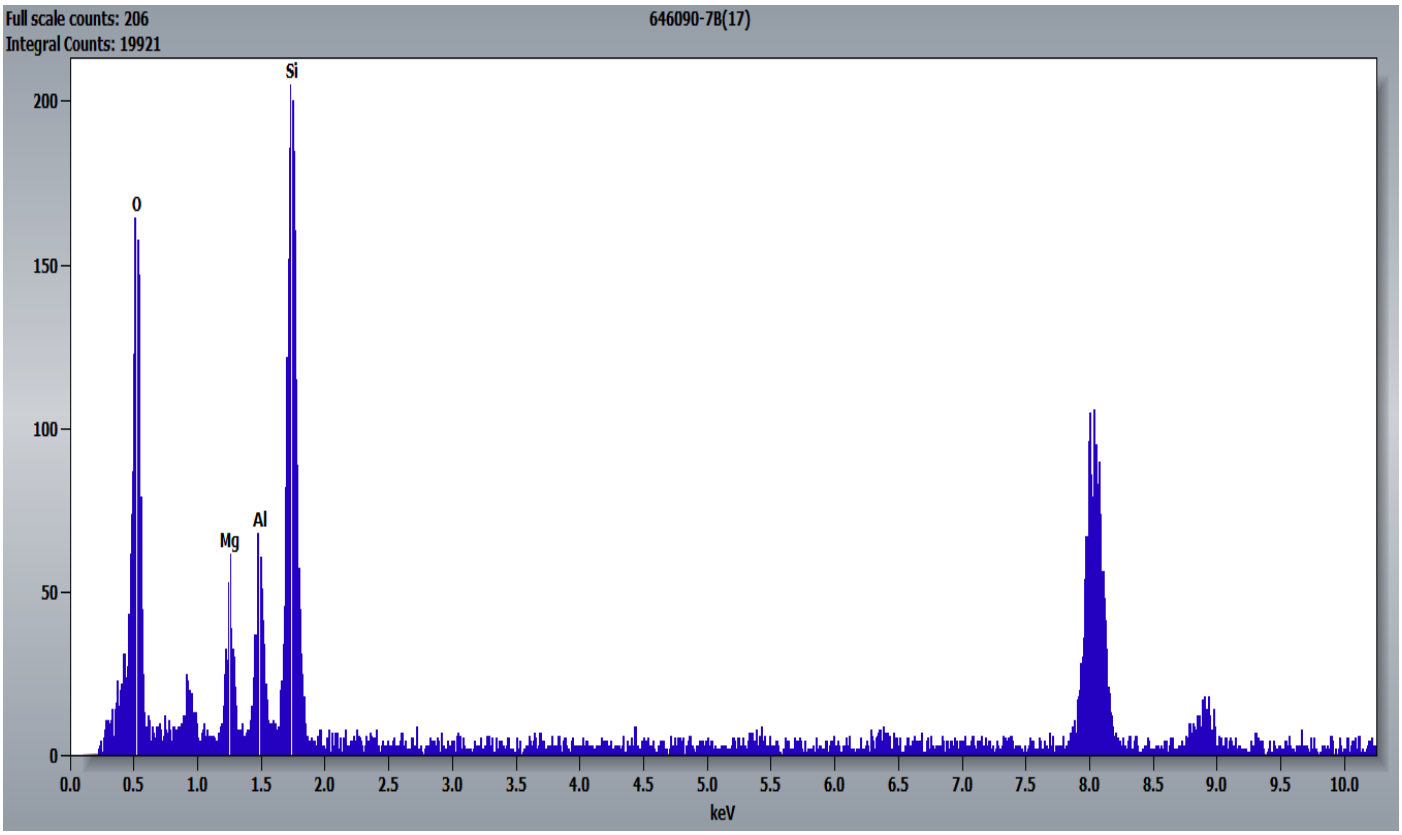
Chemistry from the Iron Particle Pictured Above



646090-7B, Elongated Particle Containing Magnesium, Aluminum, and Iron



Chemistry from the Elongated Particle Containing Magnesium, Aluminum, and Iron Pictured Above



646090-8A, 8B, 8C/Client Sample: 04032023-8

PLM

All three aliquots of sample 04032023-8 were analyzed by (b) (6) on June 9, 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.

646090-8A	No Asbestos Detected
646090-8B	No Asbestos Detected
646090-8C	No Asbestos Detected

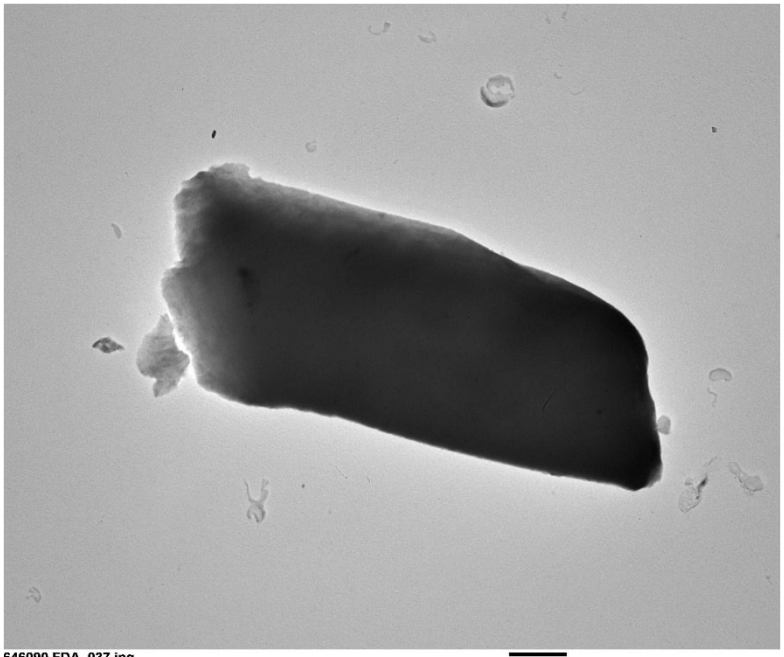
TEM

(b) (6) analyzed aliquot 8A on June 12, 2023. (b) (6) analyzed aliquots 8B and 8C on June 14, 2023. The primary particle observed was talc; silicon particles were also observed along with mica particles, silica spheres, talc ribbons/fibers, and particles containing phosphorus, sulfur, and calcium. A single (1) tremolite particle was observed on aliquot 8A and two (2) tremolite particles were observed on aliquot 8C. The results were calculated using the equations detailed in the *Calculations* section above.

646090-8A	< 0.01873%
646090-8B	No Asbestos Detected
646090-8C	< 0.00348%

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.

646090-8A, Talc Particle



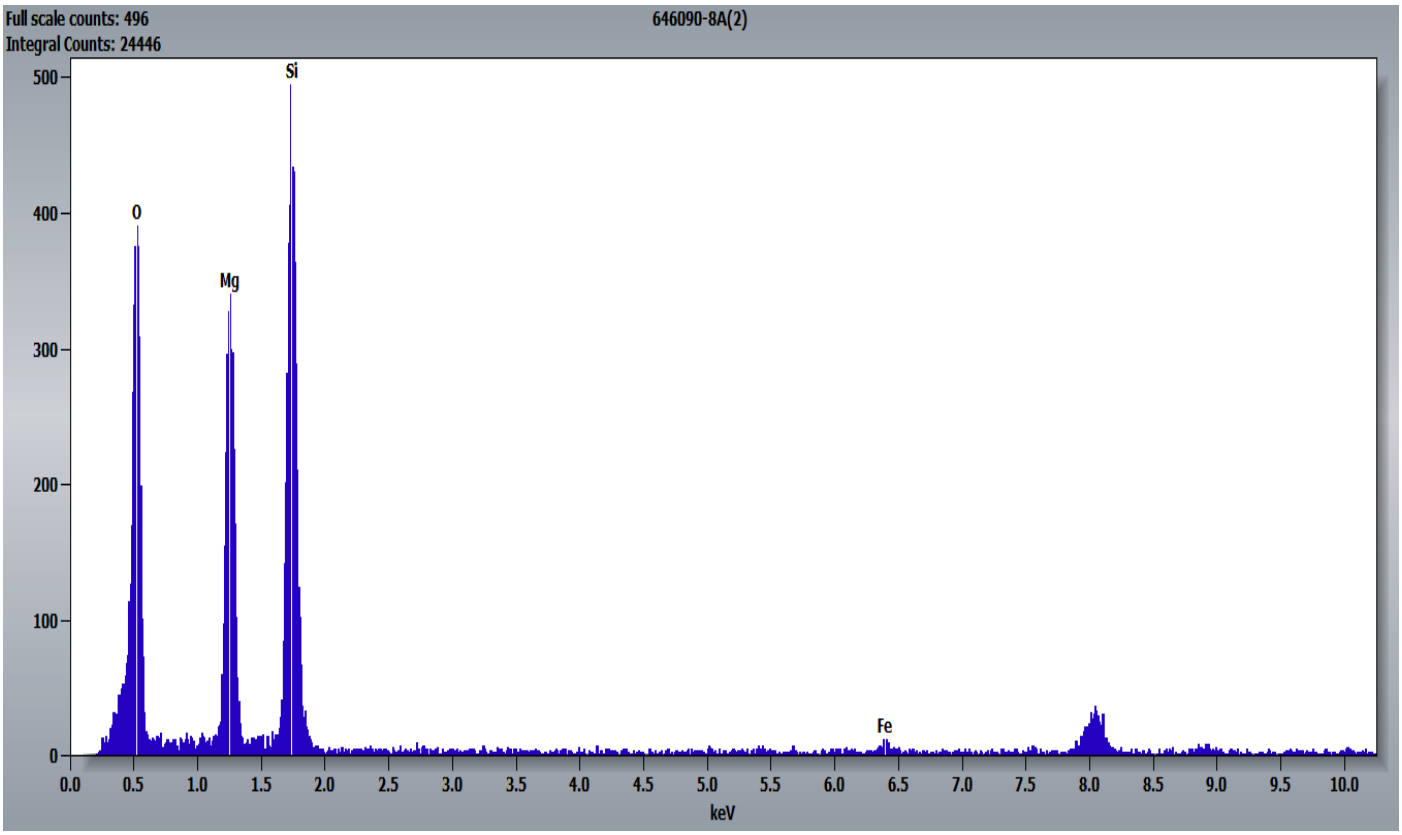
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

646090 FDA_036.jpg
646090-8A
Talc Particle

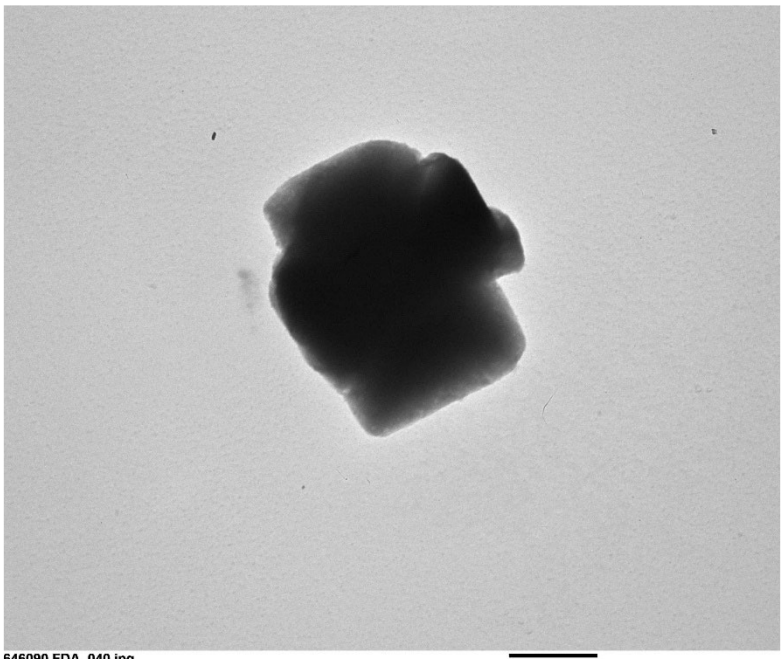
Cal: 0.005419 µm/pix
18:28 2023-06-12
TEM Mode: Diffraction
Microscopist:
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Talc Particle Pictured Above



646090-8A, Silicon Particle



646090 FDA_040.jpg
646090-8A
Si particle

Cal: 0.001775 µm/pix
18:36 2023-06-12
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

500 nm
HV=100kV
Direct Mag: 5800 x

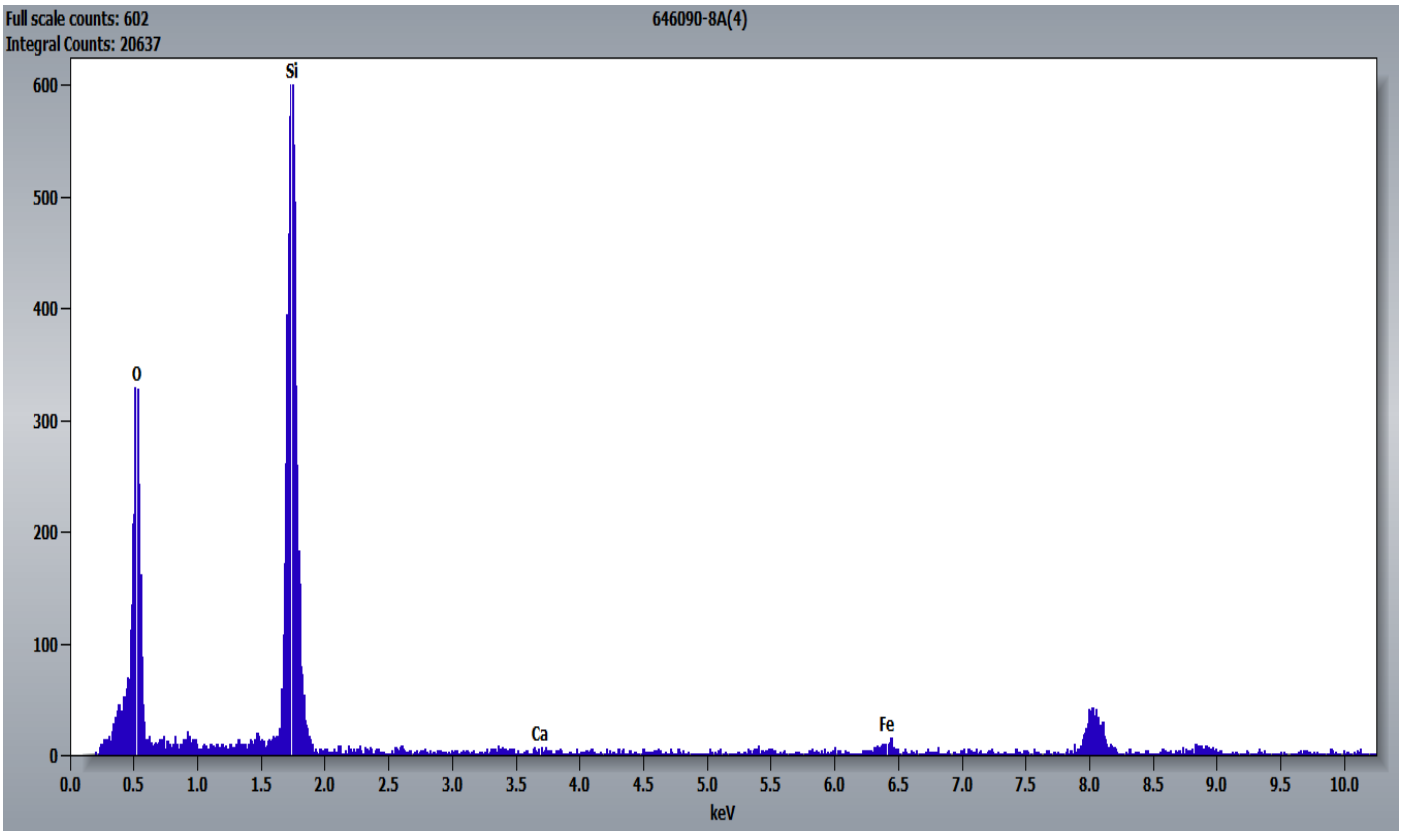
Diffraction Pattern from the Silicon Particle Pictured Above

646090 FDA_039.jpg
646090-8A
Si particle

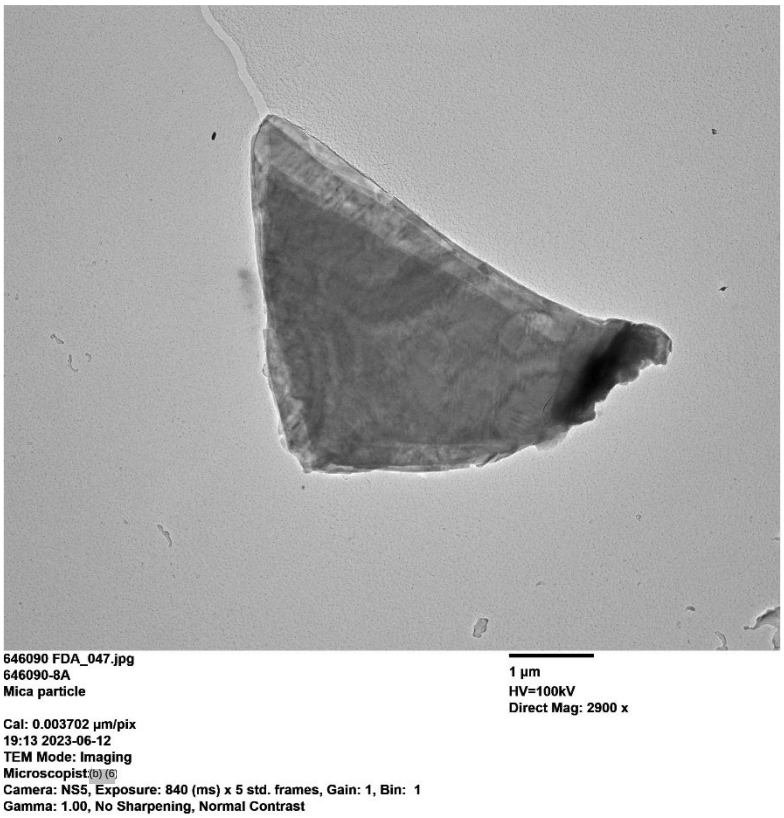
Cal: 0.001775 µm/pix
18:35 2023-06-12
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

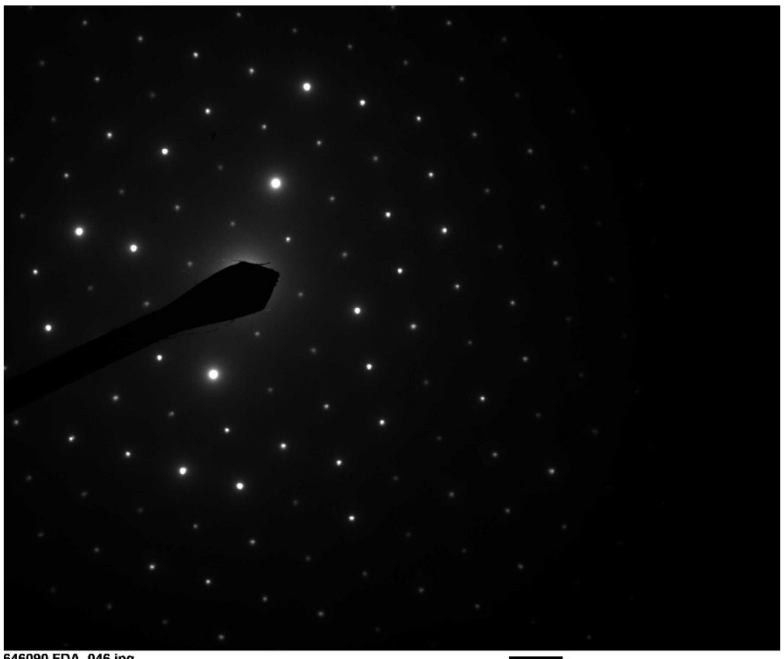
Chemistry from the Silicon Particle Pictured Above



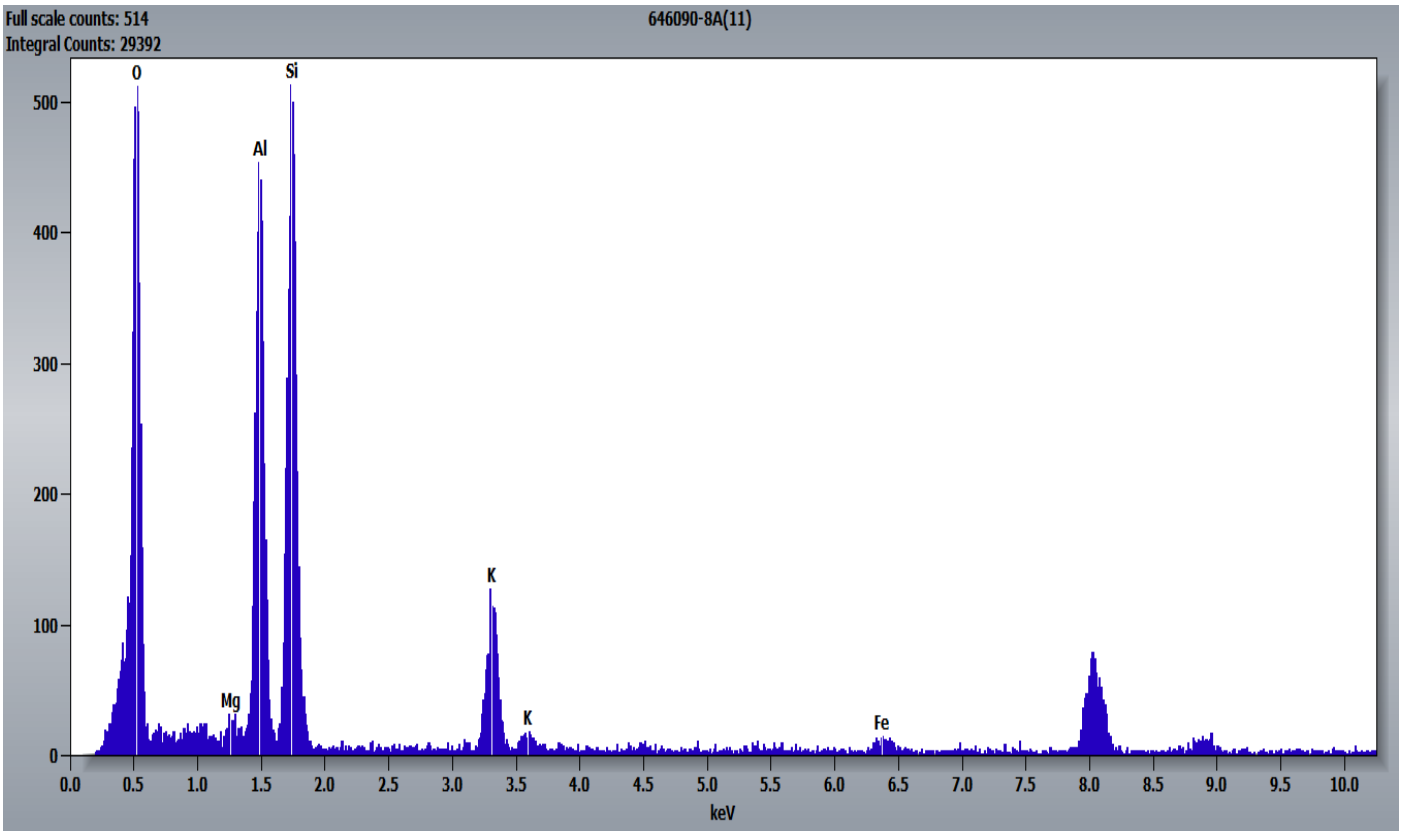
646090-8A, Mica Particle



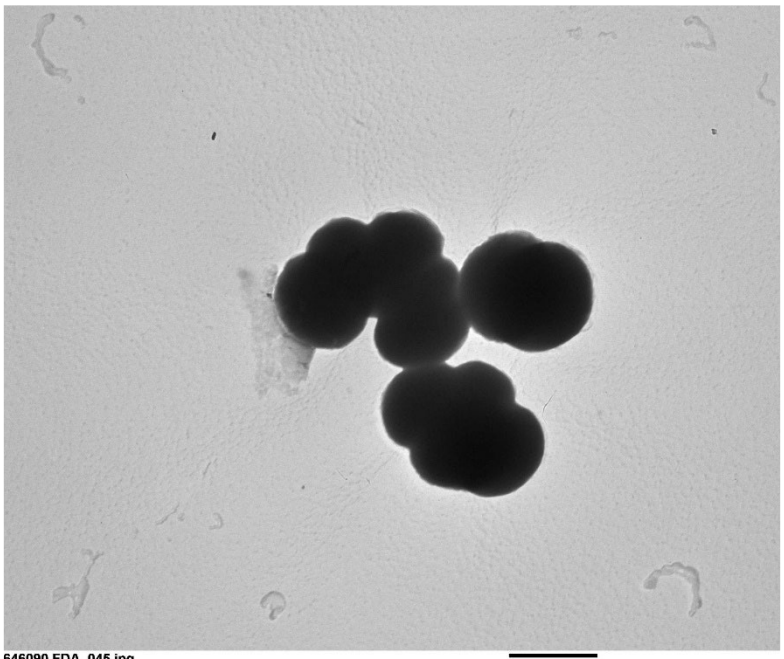
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above



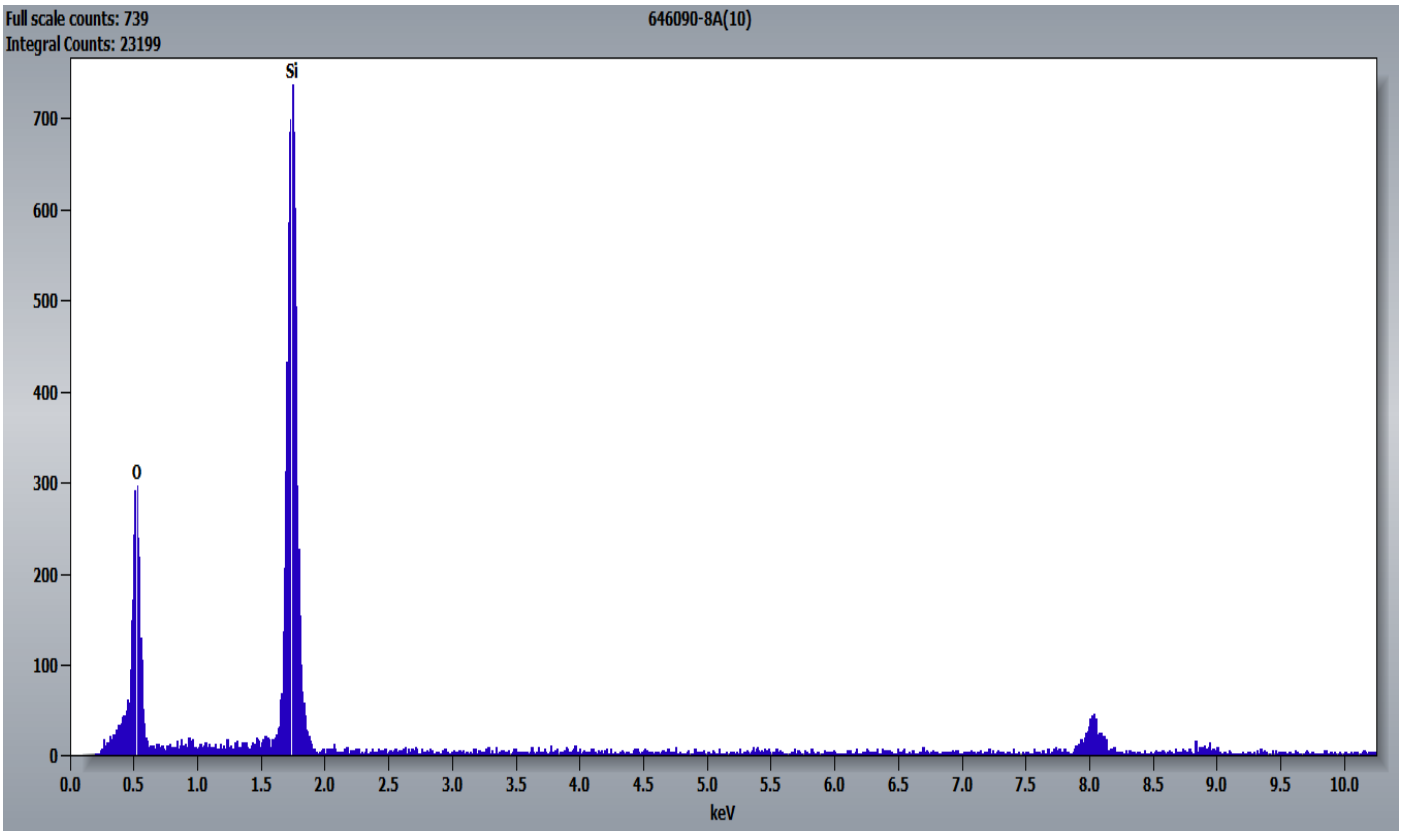
Chemistry from the Mica Pictured Above



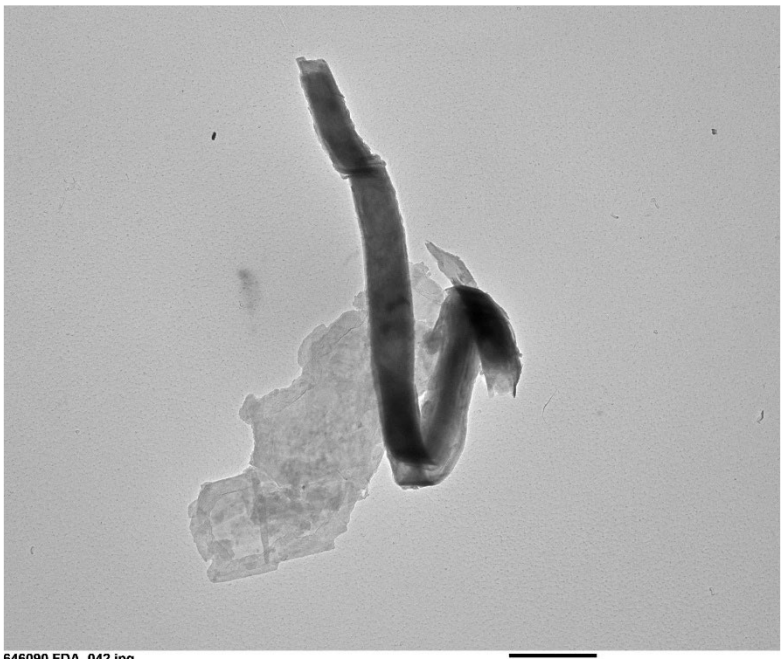
646090-8A, Silica Spheres



Chemistry from the Silica Spheres Pictured Above



646090-8A, Talc Ribbon

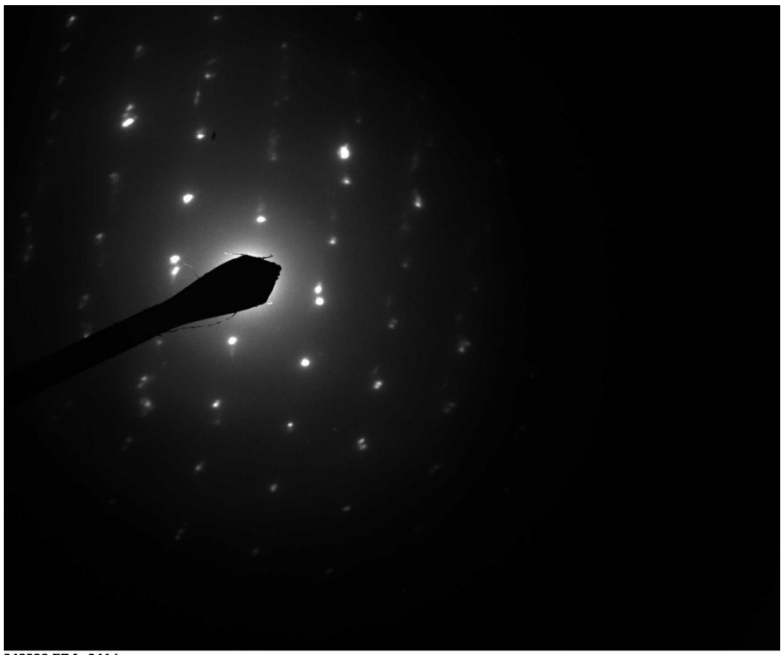


646090 FDA_042.jpg
646090-8A
talc ribbon

Cal: 0.002860 µm/pix
18:59 2023-06-12
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

800 nm
HV=100kV
Direct Mag: 3600 x

Diffraction Pattern from the Talc Ribbon Pictured Above

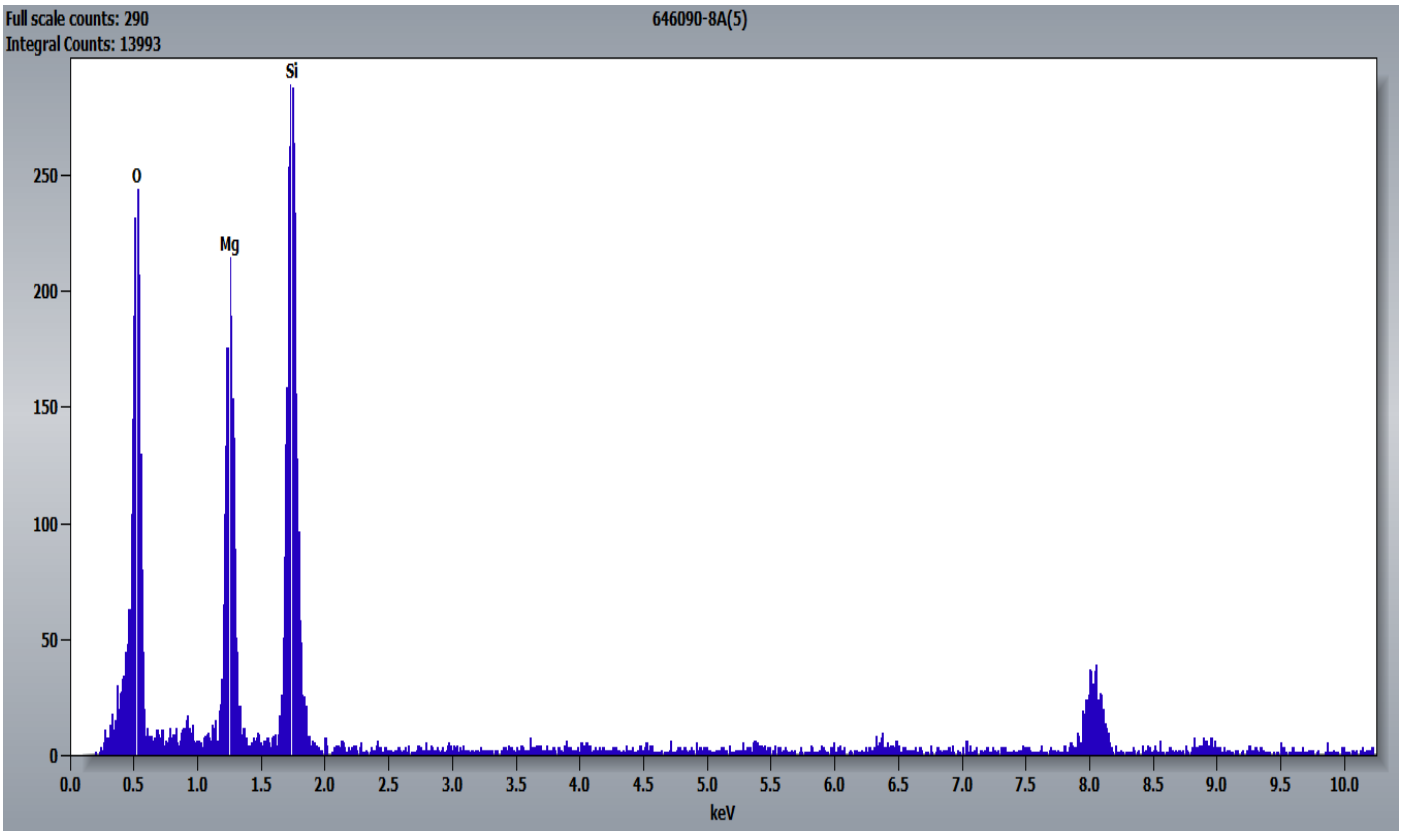


646090 FDA_041.jpg
646090-8A
talc ribbon

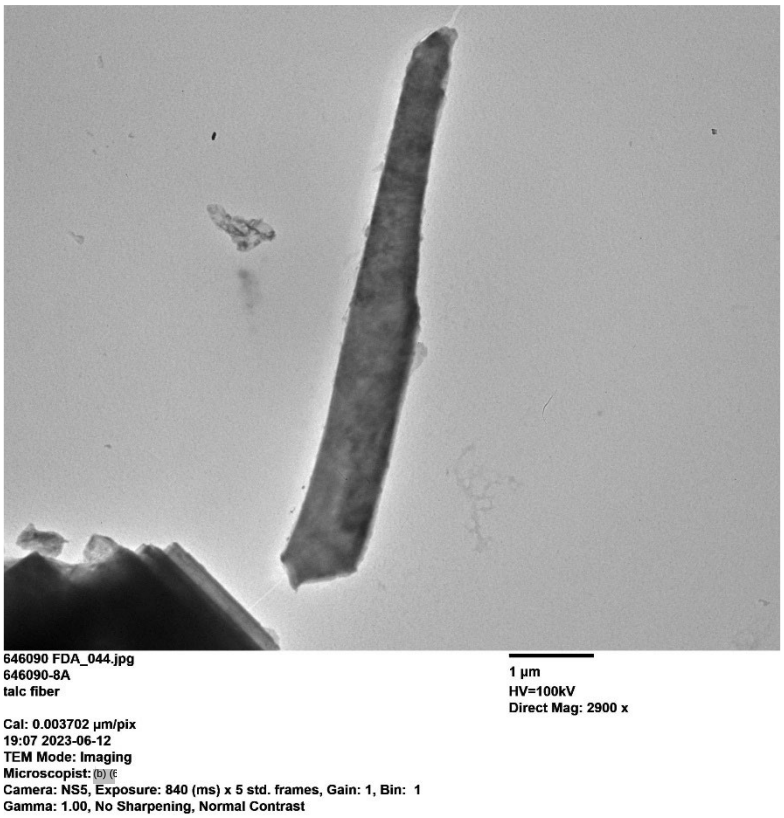
Cal: 0.001775 µm/pix
18:58 2023-06-12
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Talc Ribbon Pictured Above



646090-8A, Elongated Talc Particle



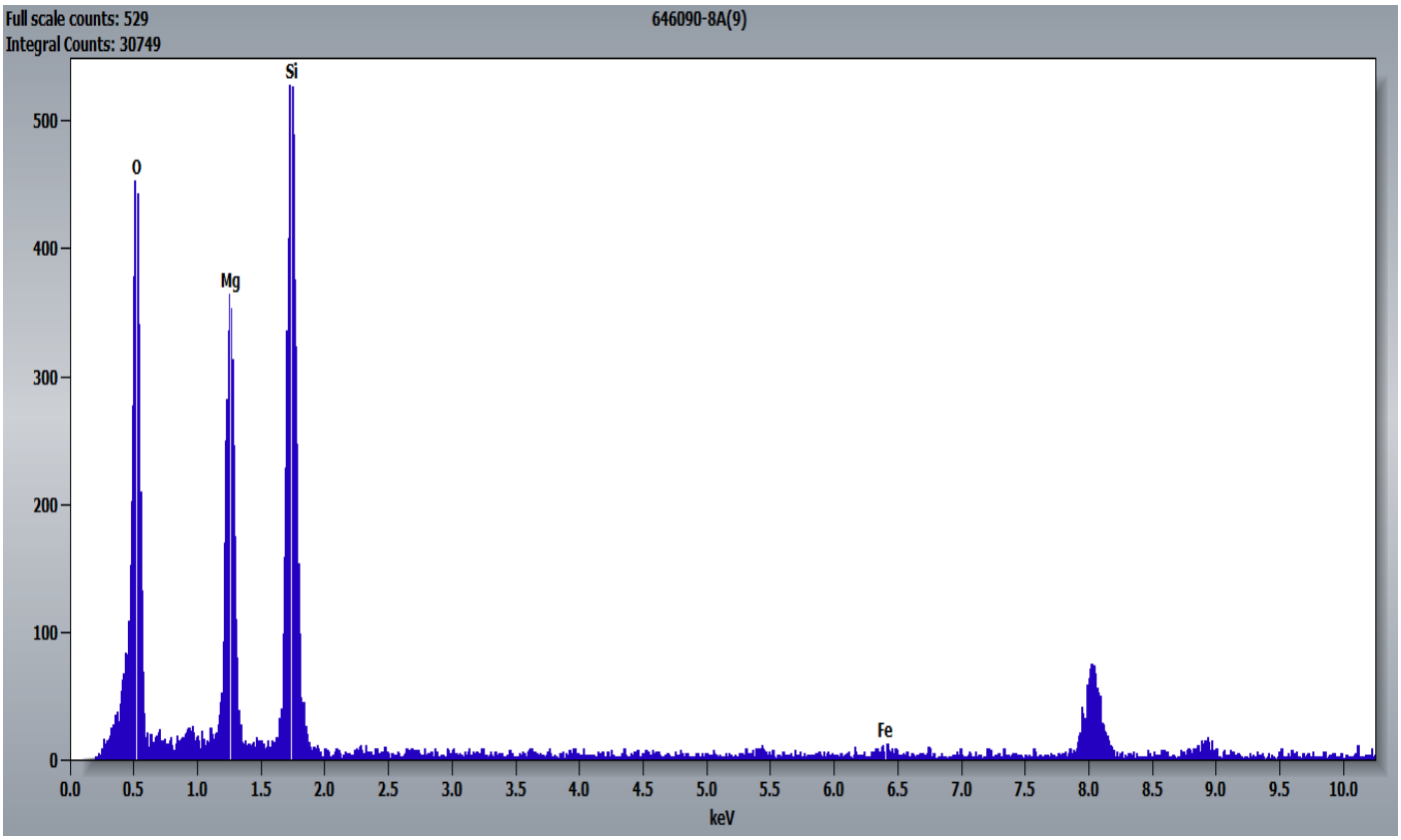
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

646090 FDA_043.jpg
646090-8A
talc fiber

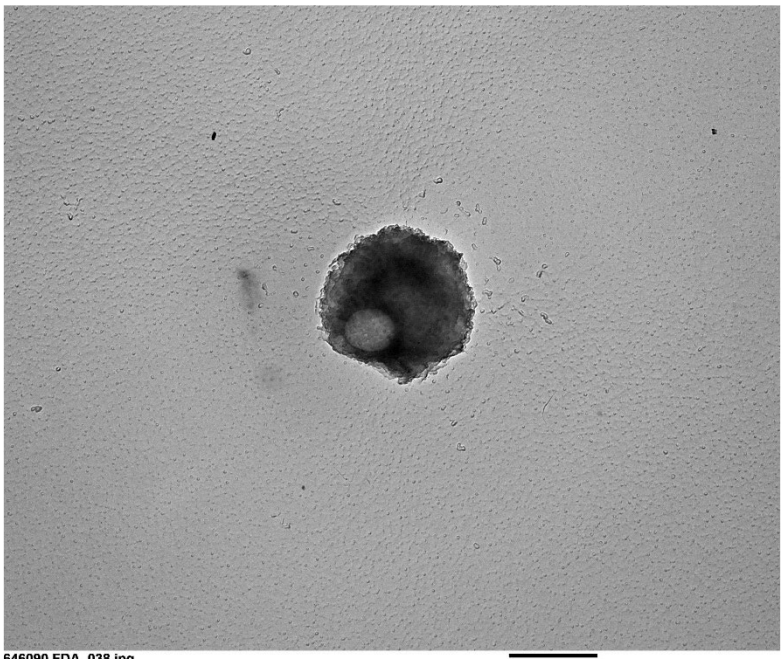
Cal: 0.002860 µm/pix
19:05 2023-06-12
TEM Mode: Diffraction
Microscopist:
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Elongated Talc Particle Pictured Above



646090-8A, Particle Containing Phosphorus, Sulfur, and Calcium

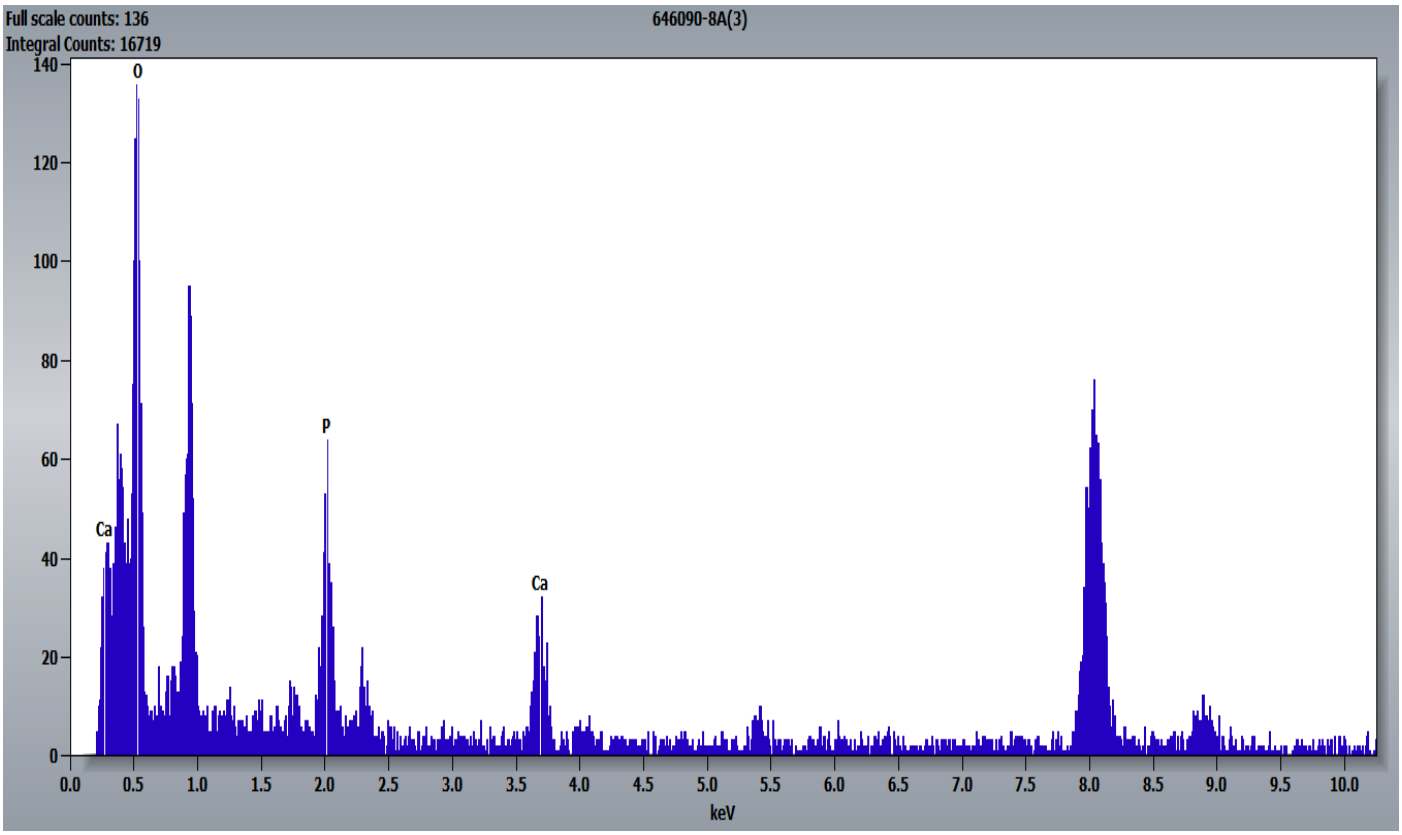


646090 FDA_038.jpg
646090-8A
P,S,Ca particle

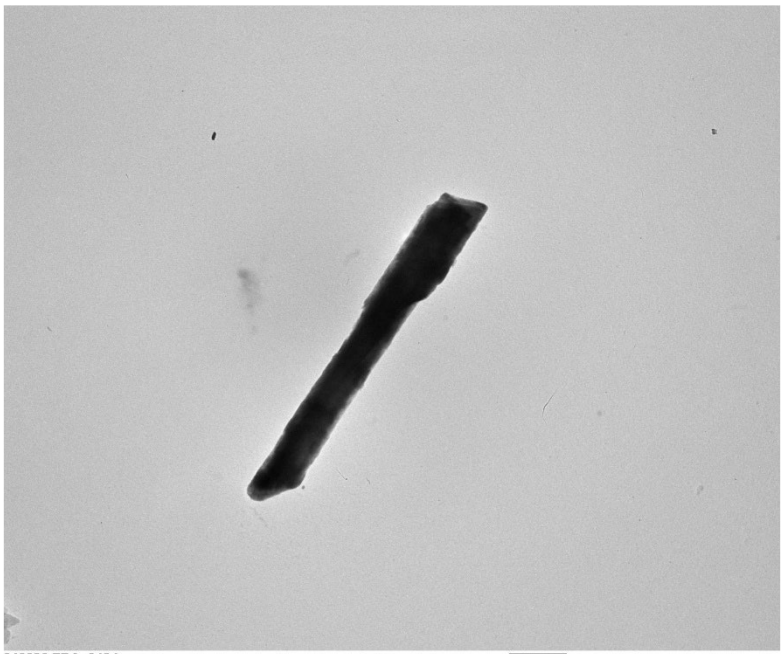
Cal: 0.001775 µm/pix
18:33 2023-06-12
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

500 nm
HV=100kV
Direct Mag: 5800 x

Chemistry from the Particle Containing Phosphorus, Sulfur, and Calcium Pictured Above



646090-8A, Tremolite Particle



646090 FDA_048.jpg
646090-8A
Tremolite

Cal: 0.005419 µm/pix
15:53 2023-06-14
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=100kV
Direct Mag: 1900 x

Diffraction Pattern(s) from the Tremolite Particle Pictured Above

646090 FDA_049.jpg
646090-8A
Tremolite

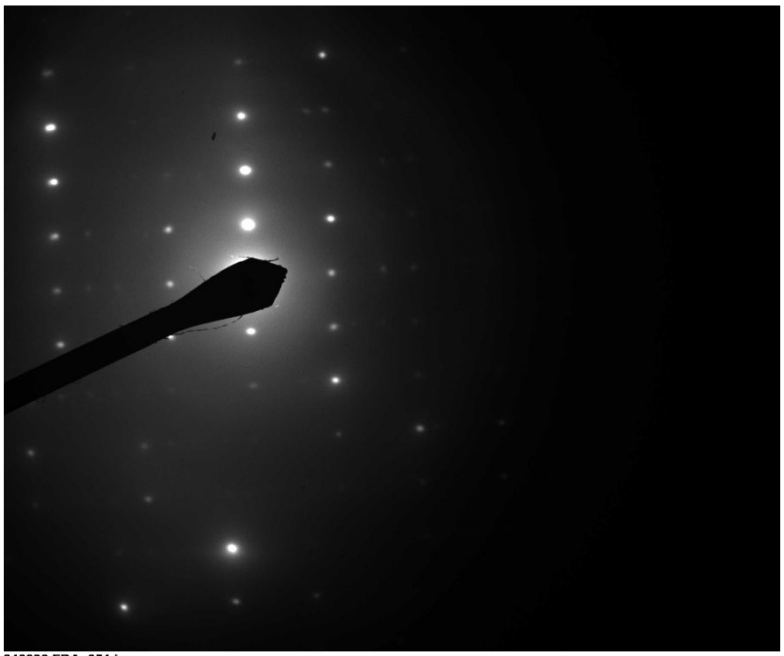
Cal: 0.005419 µm/pix
15:55 2023-06-14
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

646090 FDA_050.jpg
646090-8A
Tremolite

Cal: 0.005419 µm/pix
15:56 2023-06-14
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m



646090 FDA_051.jpg
646090-8A
Tremolite

Cal: 0.005419 µm/pix
15:57 2023-06-14
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

646090 FDA_052.jpg
646090-8A
Tremolite

Cal: 0.005419 µm/pix
15:58 2023-06-14
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

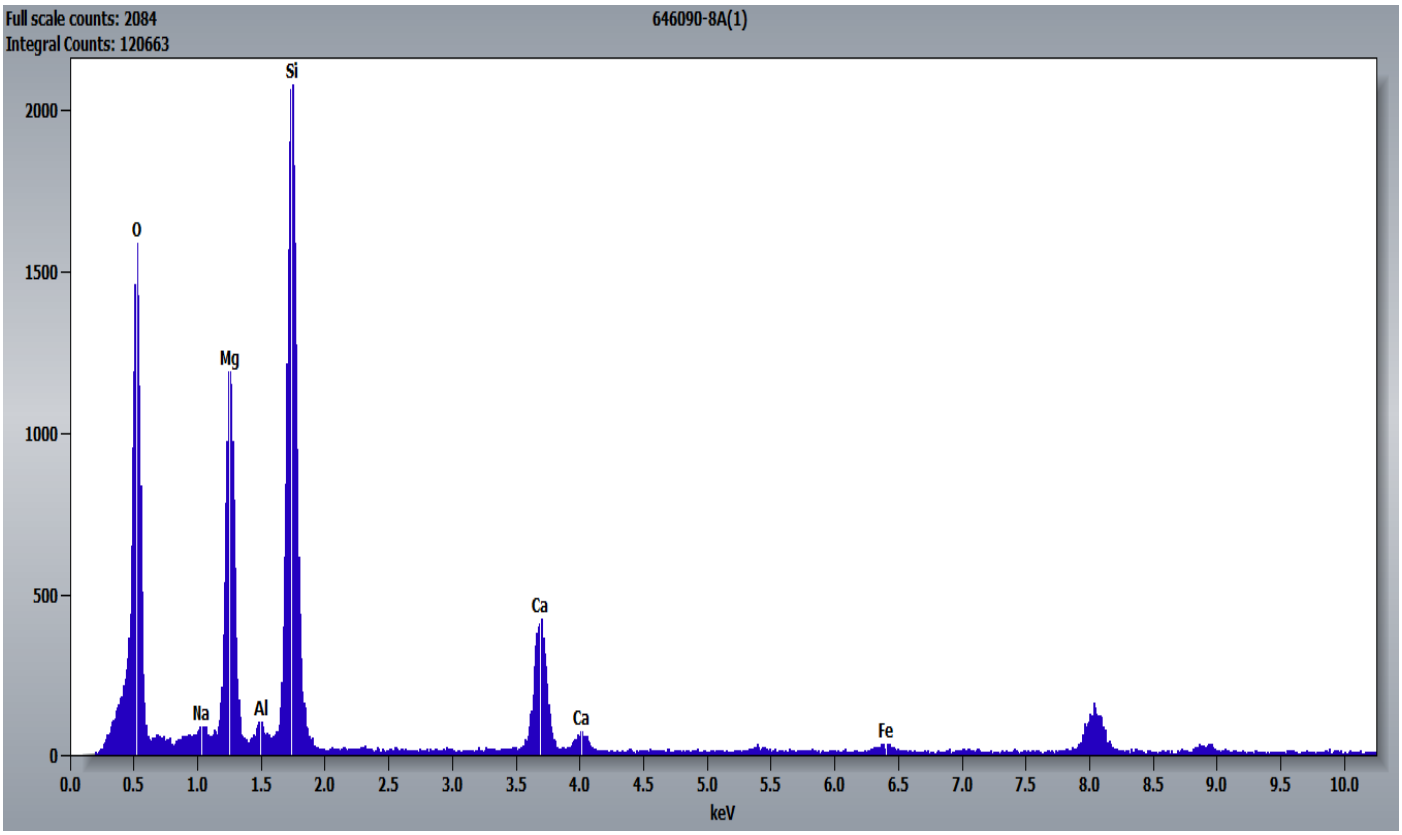
0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

646090 FDA_053.jpg
646090-8A
Tremolite

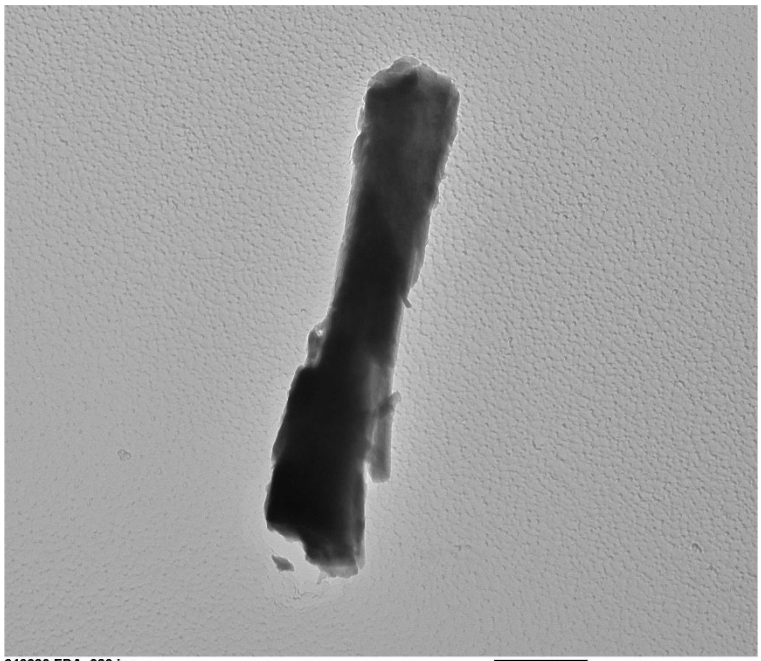
Cal: 0.005419 µm/pix
15:59 2023-06-14
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Tremolite Particle Pictured Above



646090-8C, Tremolite Particle 1

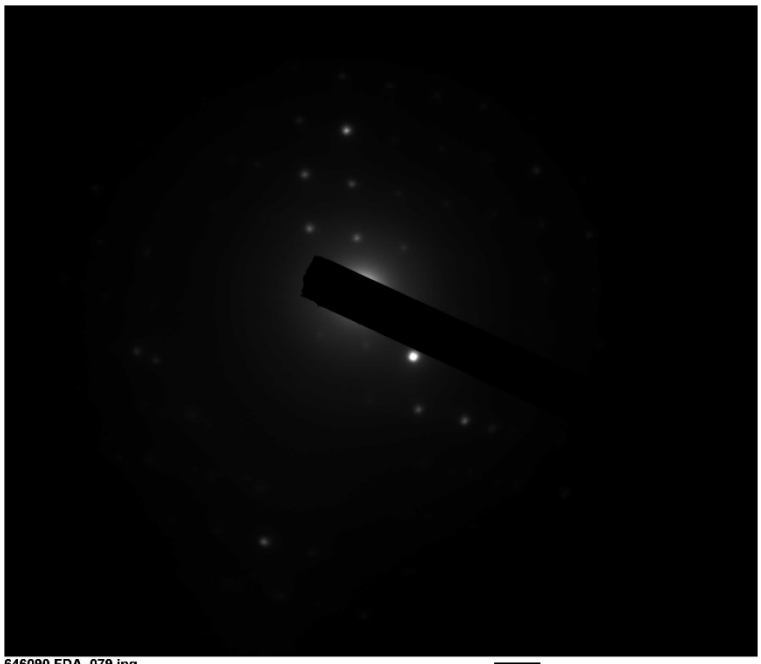


646090 FDA_080.jpg
646090-8C
Tremolite

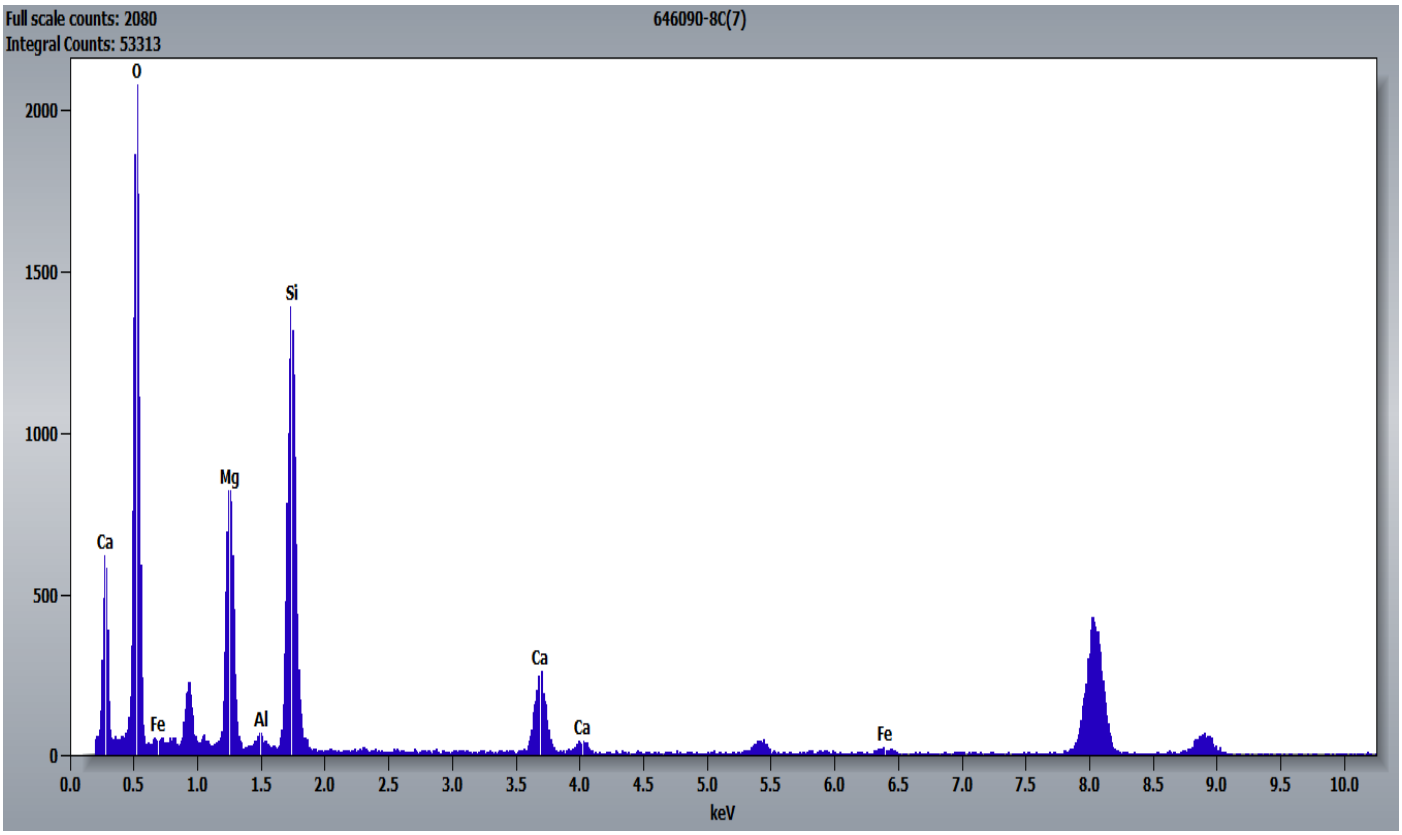
Cal: 0.001209 µm/pix
11:49 2023-06-14
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=80kV
Direct Mag: 8000 x

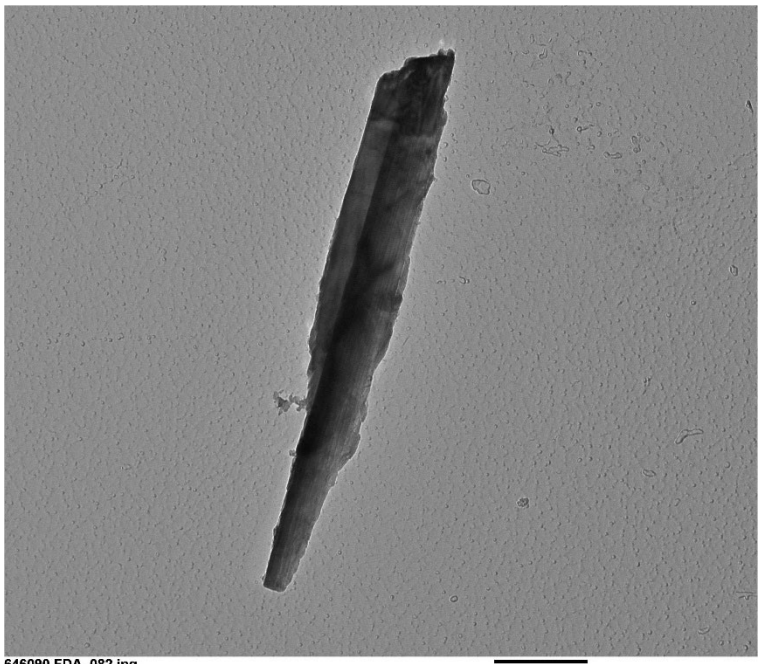
Diffraction Pattern from the Tremolite Particle Pictured Above



Chemistry from the Tremolite Particle Pictured Above



646090-8C, Tremolite Particle 2



646090 FDA_082.jpg
646090-8C
Tremolite

Cal: 0.001209 µm/pix
12:17 2023-06-14
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

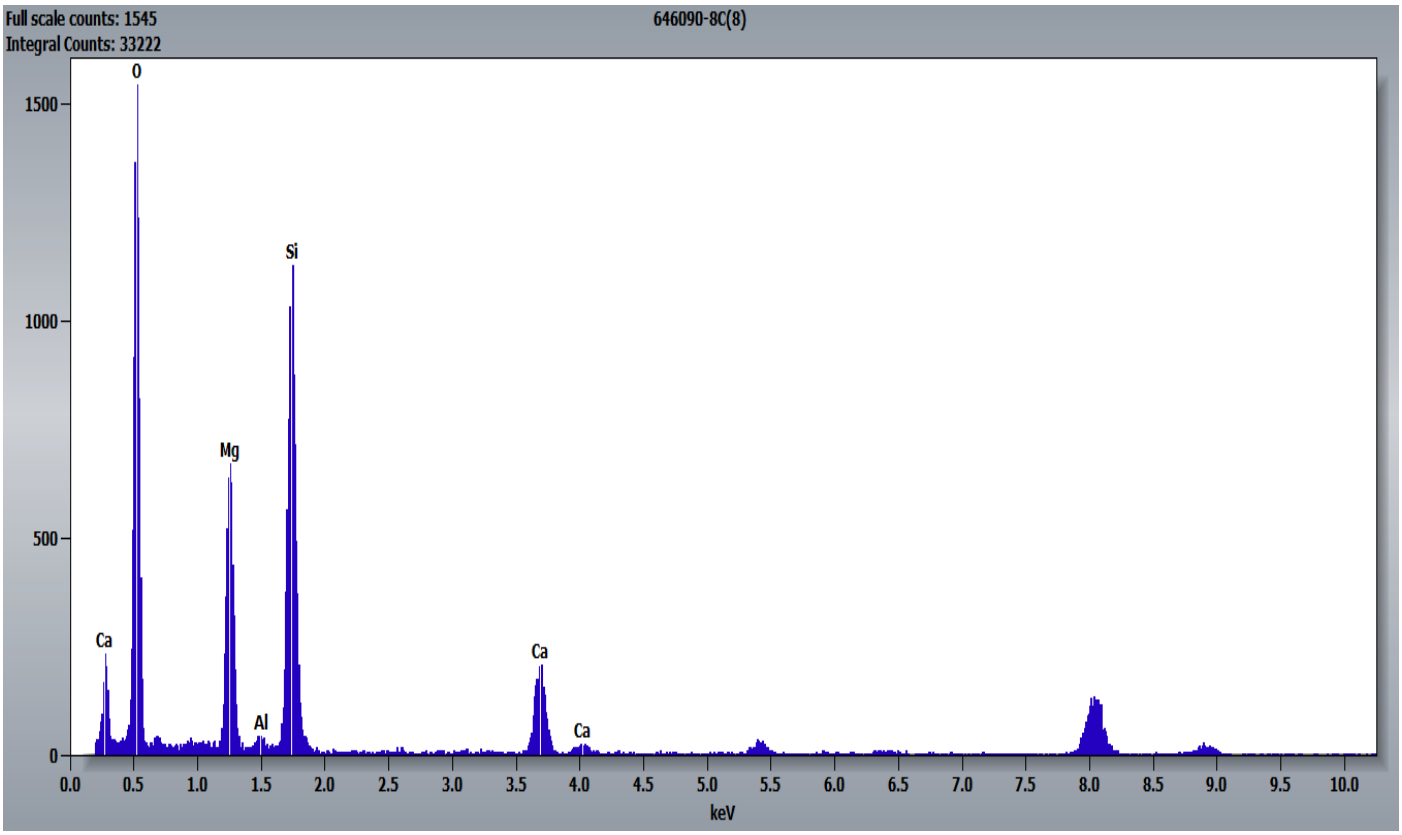
Diffraction Pattern from the Tremolite Particle Pictured Above

646090 FDA_081.jpg
646090-8C
Tremolite

Cal: 0.001209 µm/pix
12:16 2023-06-14
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 Tremolite Particle Pictured Above



646090-9A, 9B, 9C/Client Sample: 04032023-9

PLM

All three aliquots of sample 04032023-9 were analyzed by (b) (6) on June 9, 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.

646090-9A	No Asbestos Detected
646090-9B	No Asbestos Detected
646090-9C	No Asbestos Detected

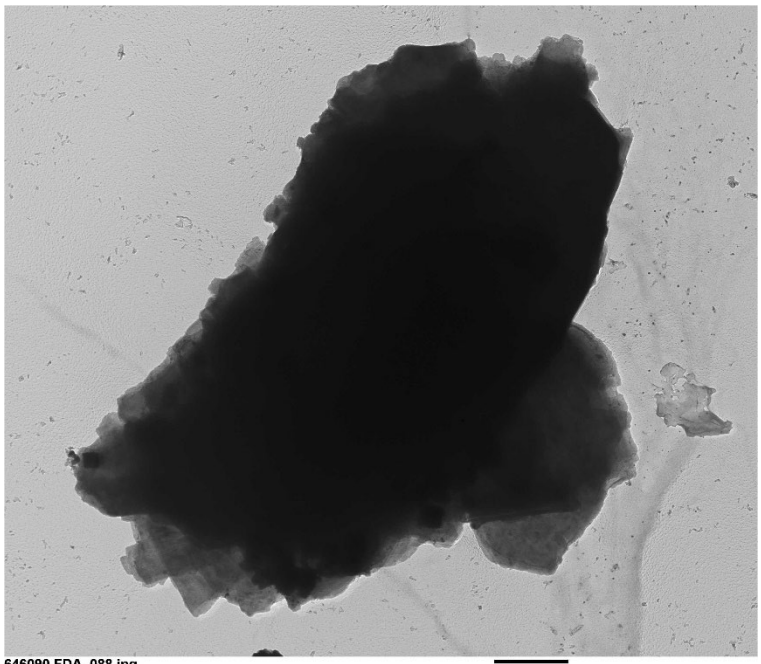
TEM

(b) (6) analyzed aliquot 9A on June 15, 2023, and aliquot 9C on June 16, 2023. (b) (6) analyzed aliquot 9B June 16, 2023. The primary particles observed were talc and mica; talc ribbons/fibers and iron 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.

646090-9A	No Asbestos Detected
646090-9B	No Asbestos Detected
646090-9C	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.

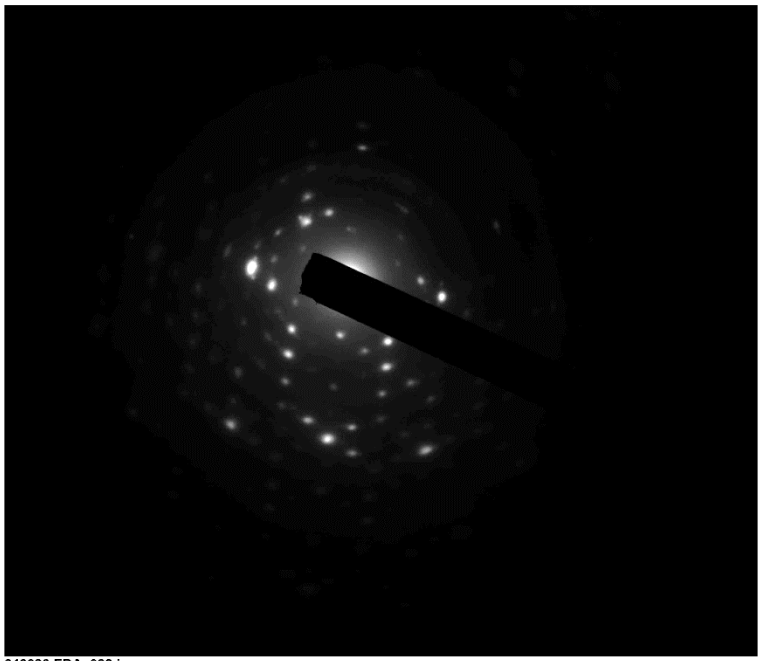
646090-9A, Talc Particle (Dense)



646090 FDA_088.jpg
646090-9A
Talc
Dense particle
Cal: 0.003819 µm/pix
11:57 2023-06-15
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

1 µm
HV=80kV
Direct Mag: 2500 x

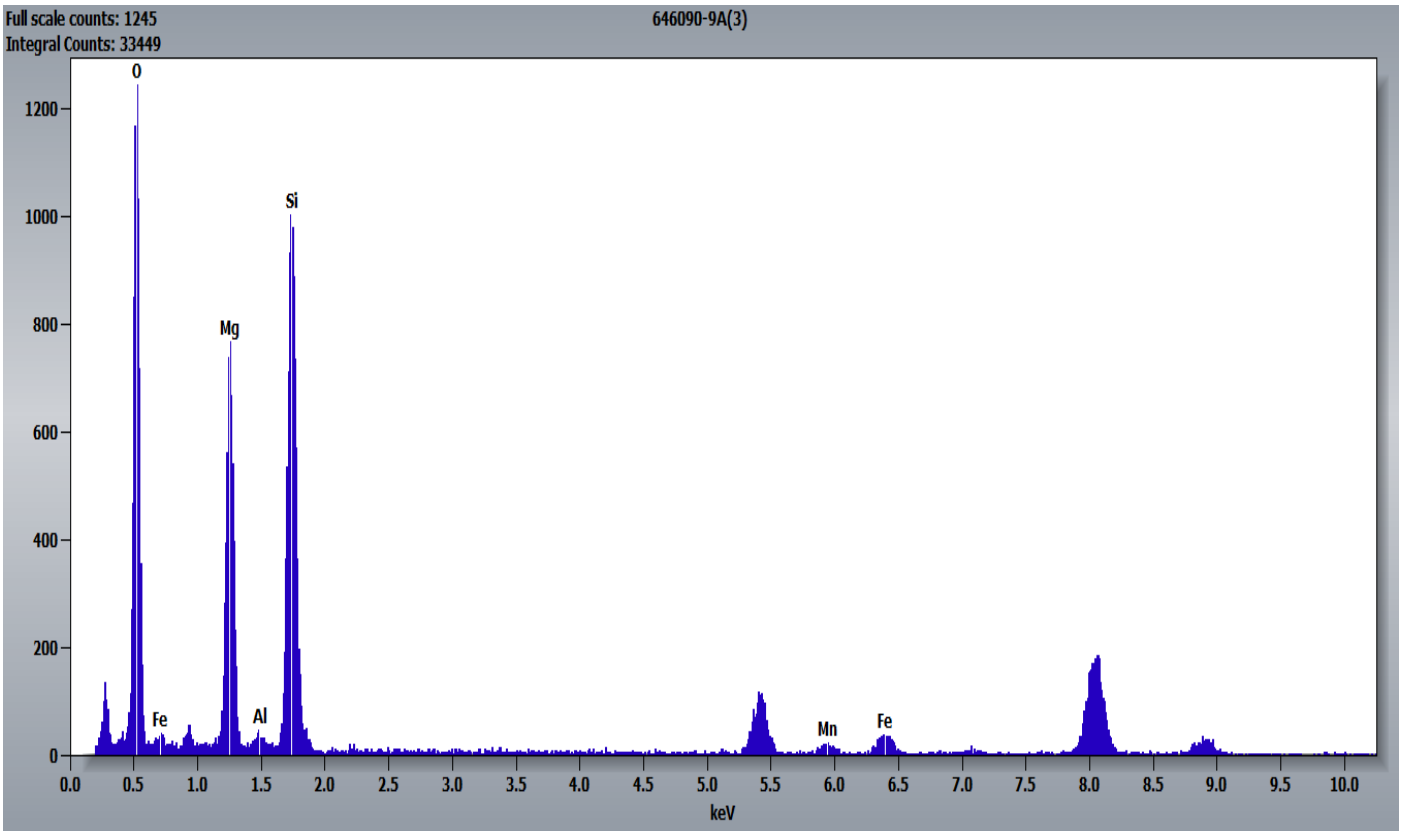
Diffraction Pattern from the Talc Particle (Dense) Pictured Above



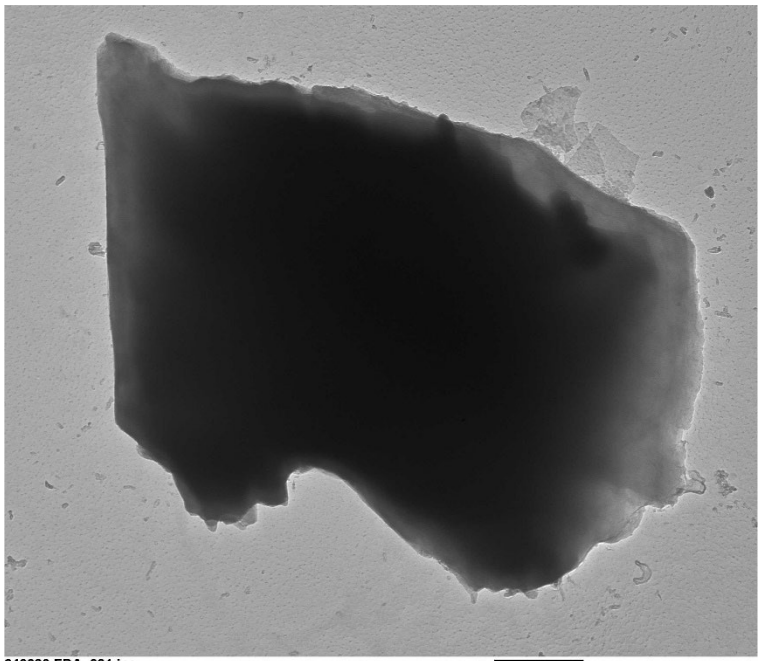
646090 FDA_089.jpg
646090-9A
Talc
Dense particle
Cal: 0.003819 µm/pix
12:02 2023-06-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle (Dense) Pictured Above



646090-9A, Talc Particle

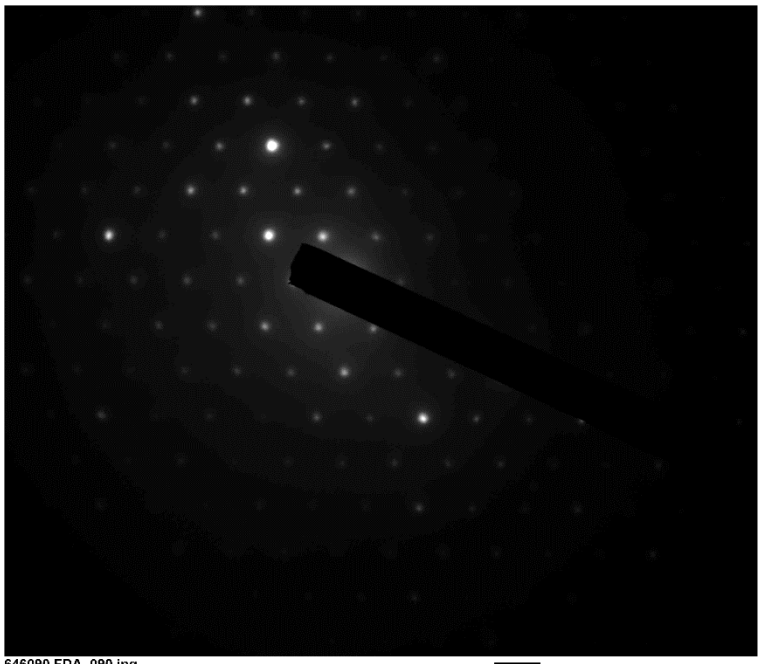


646090 FDA_091.jpg
646090-9A
Talc

Cal: 0.001905 µm/pix
12:06 2023-06-15
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

600 nm
HV=80kV
Direct Mag: 5000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

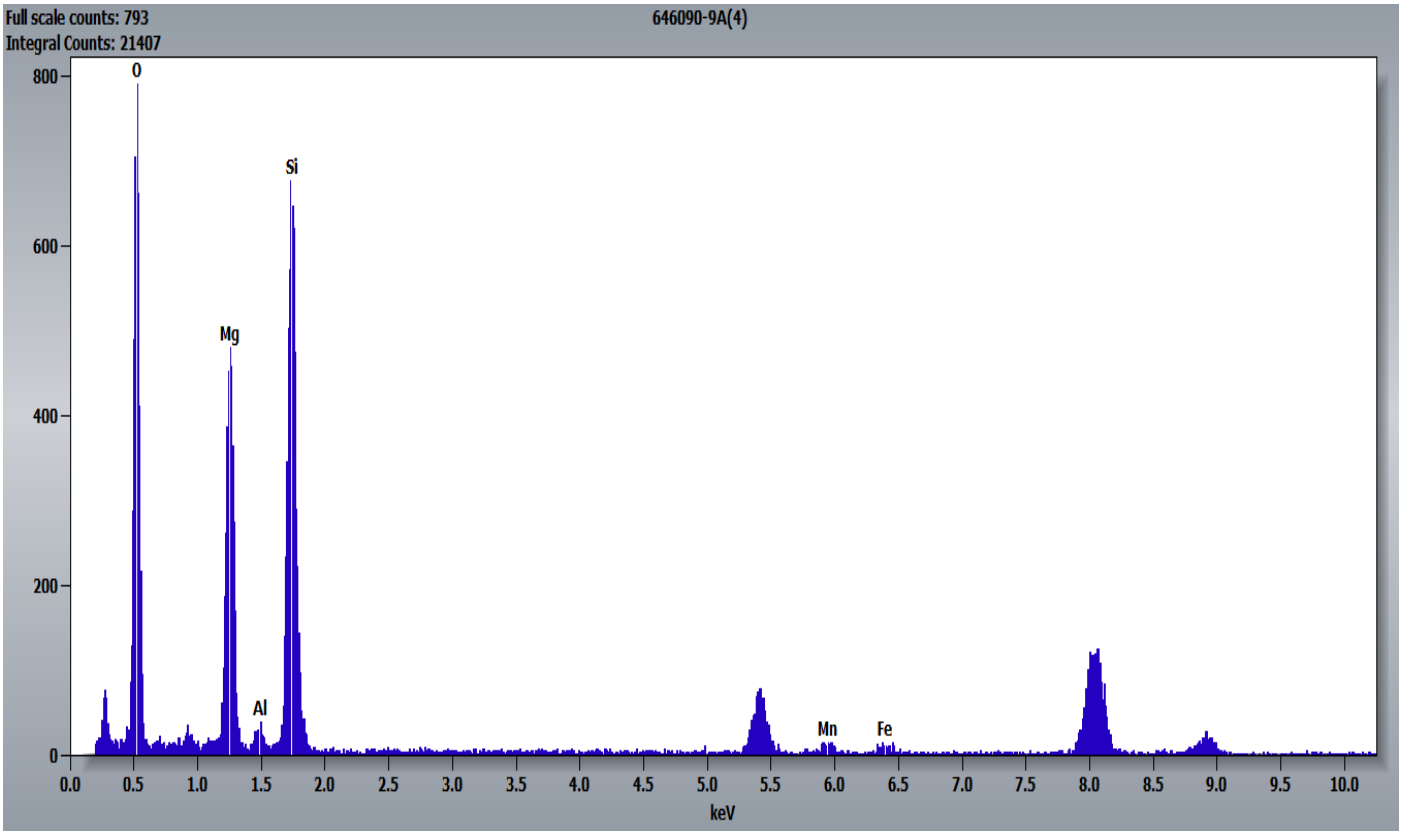


646090 FDA_090.jpg
646090-9A
Talc

Cal: 0.003819 µm/pix
12:05 2023-06-15
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

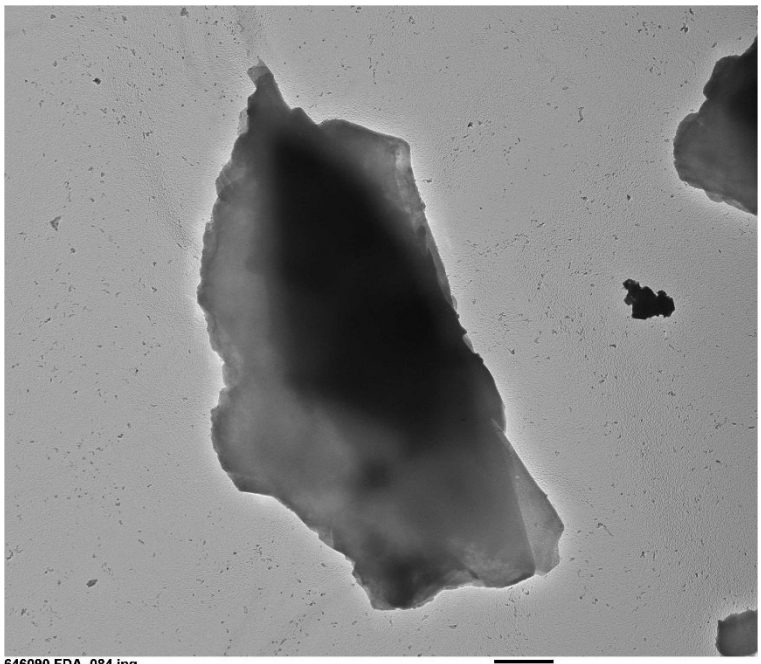
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Particle Pictured Above



Asbestos · Lead · Mold · Nano

646090-9A, Mica Particle

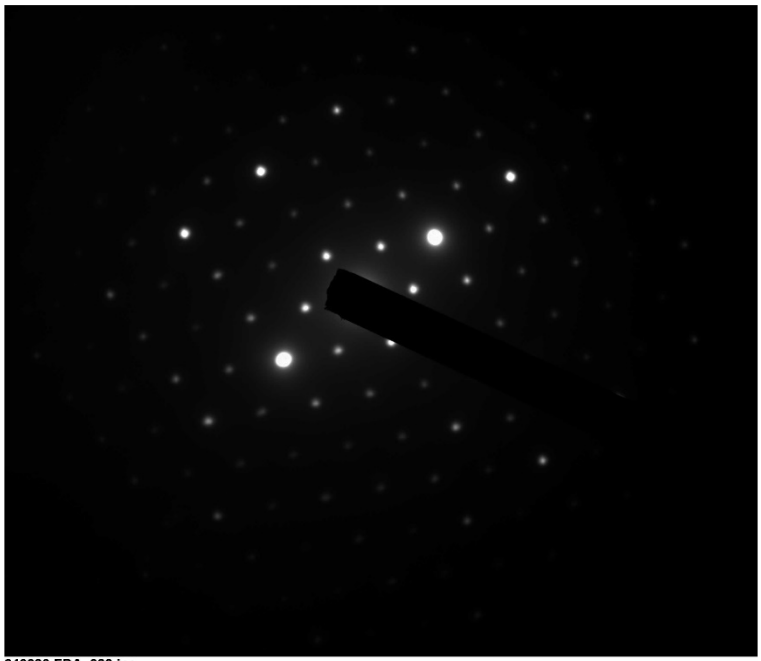


646090 FDA_084.jpg
646090-9A
Mica

Cal: 0.004774 µm/pix
11:50 2023-06-15
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

1 µm
HV=80kV
Direct Mag: 2000 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

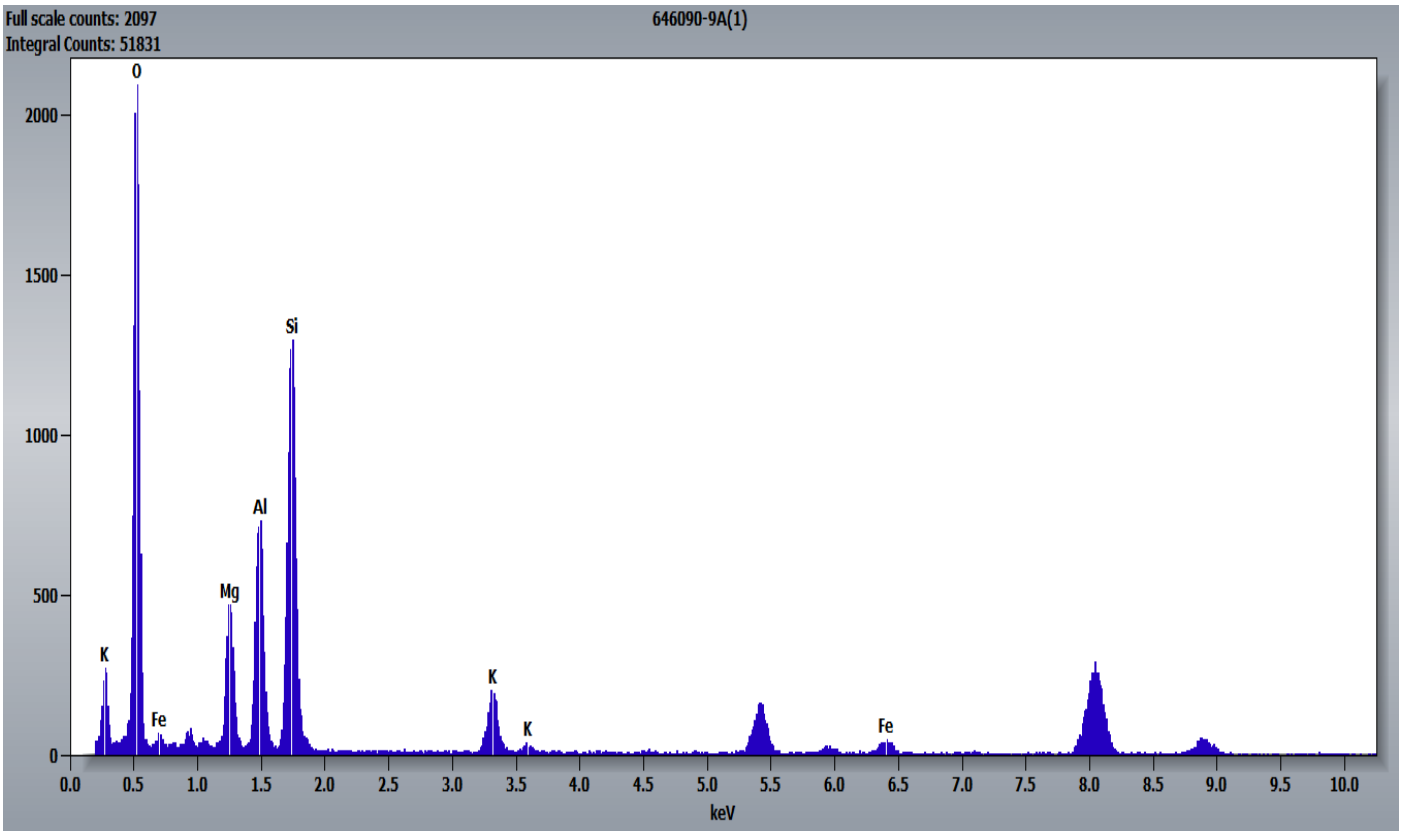


646090 FDA_083.jpg
646090-9A
Mica

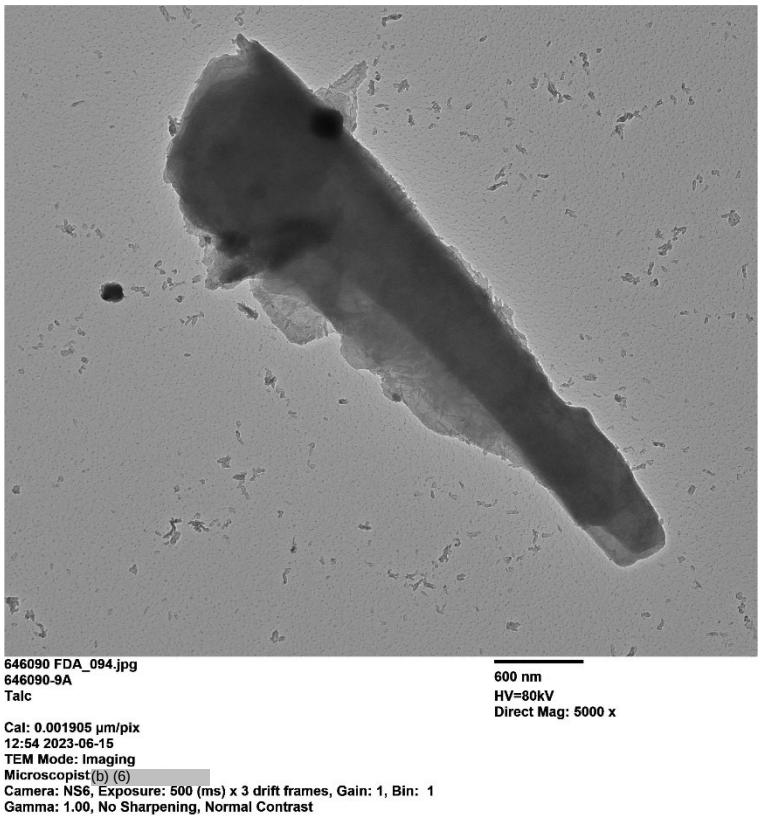
11:46 2023-06-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

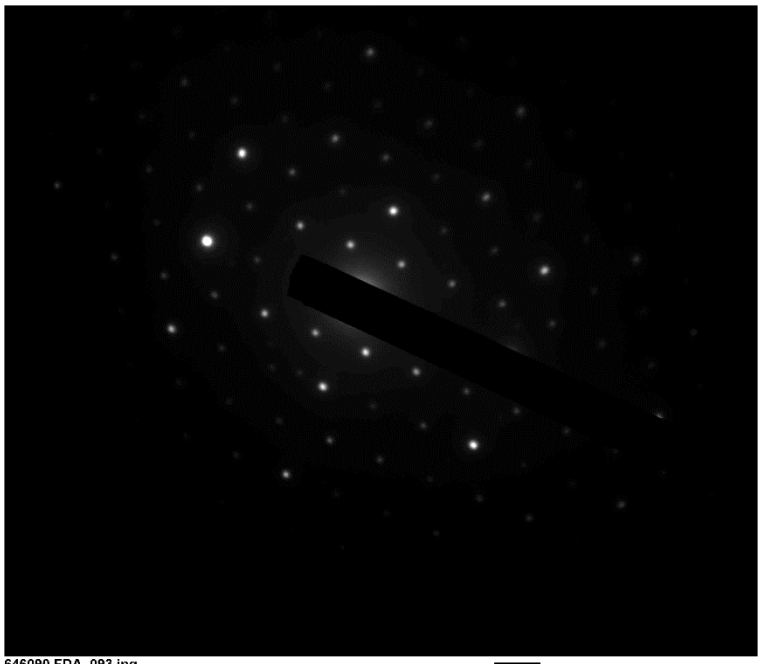
Chemistry from the Mica Particle Pictured Above



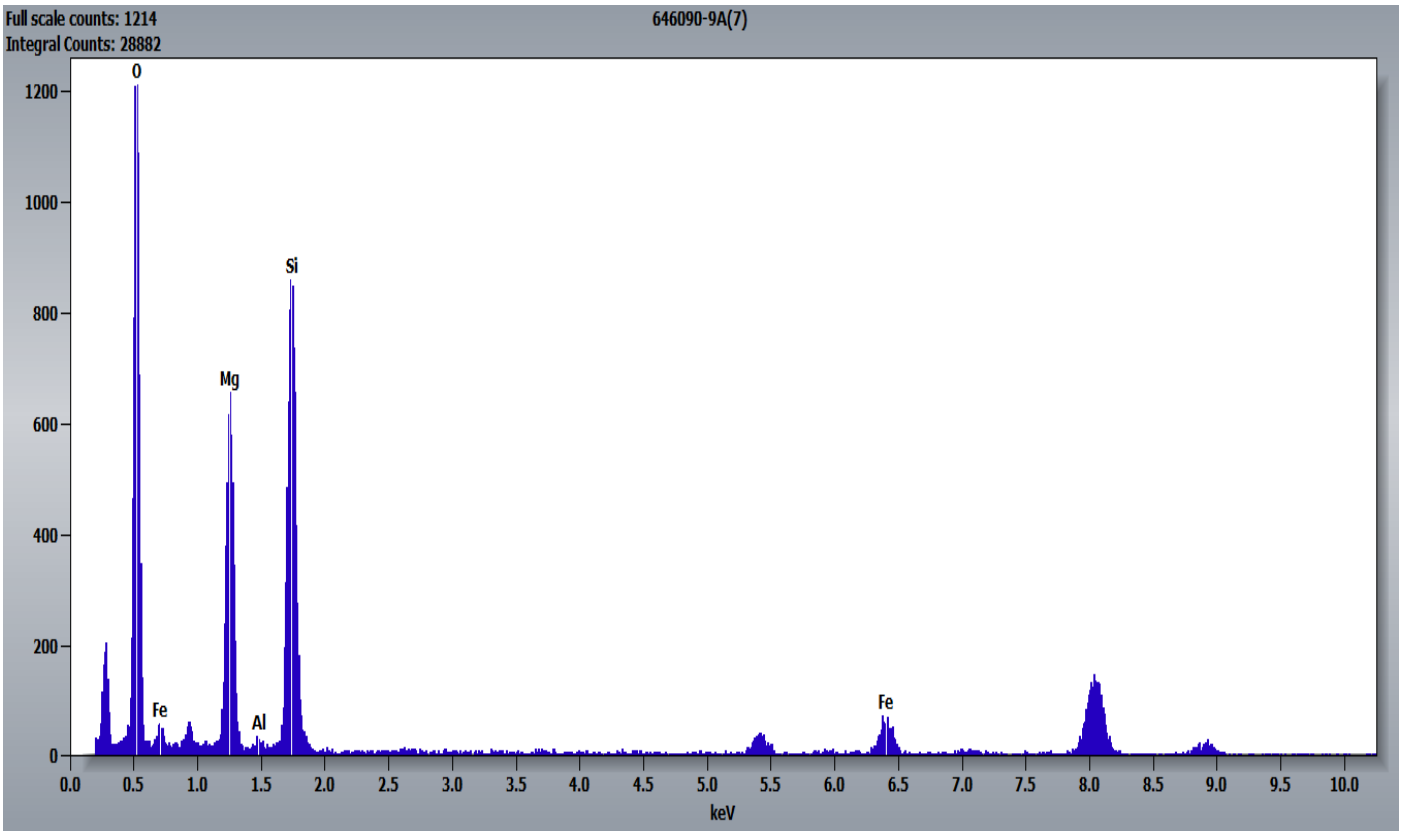
646090-9A, Elongated Talc Particle



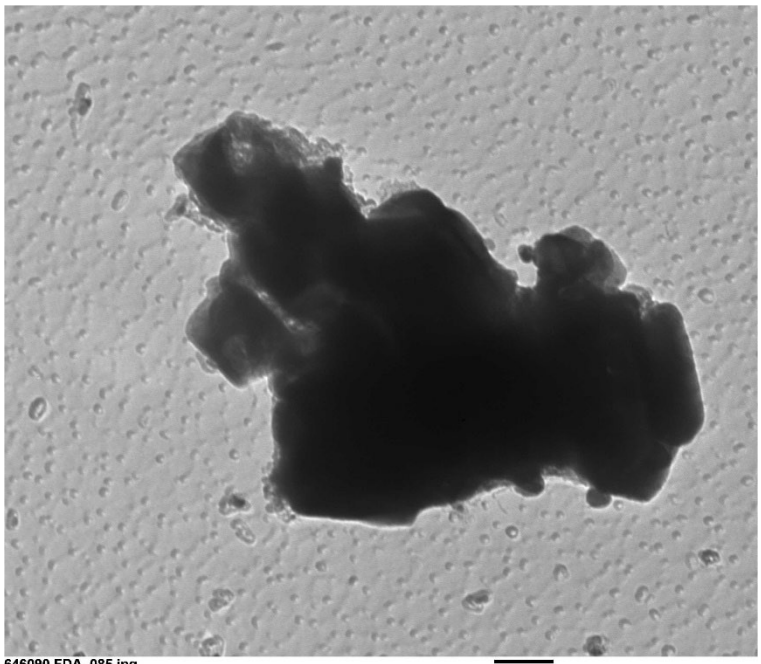
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



Chemistry from the Elongated Talc Particle Pictured Above



646090-9A, Iron Particle

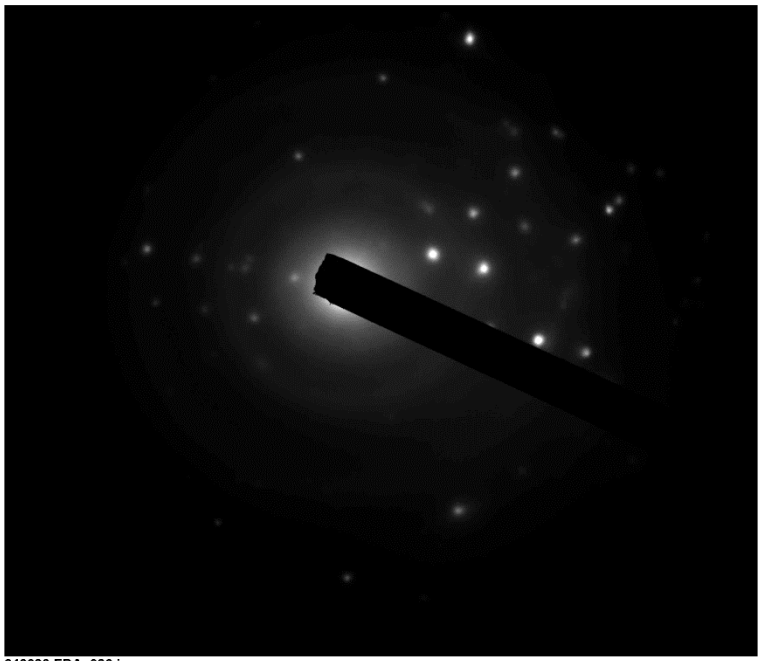


646090 FDA_085.jpg
646090-9A
Iron particles

Cal: 0.000477 µm/pix
11:54 2023-06-15
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

100 nm
HV=80kV
Direct Mag: 20000 x

Diffraction Pattern from the Iron Particle Pictured Above

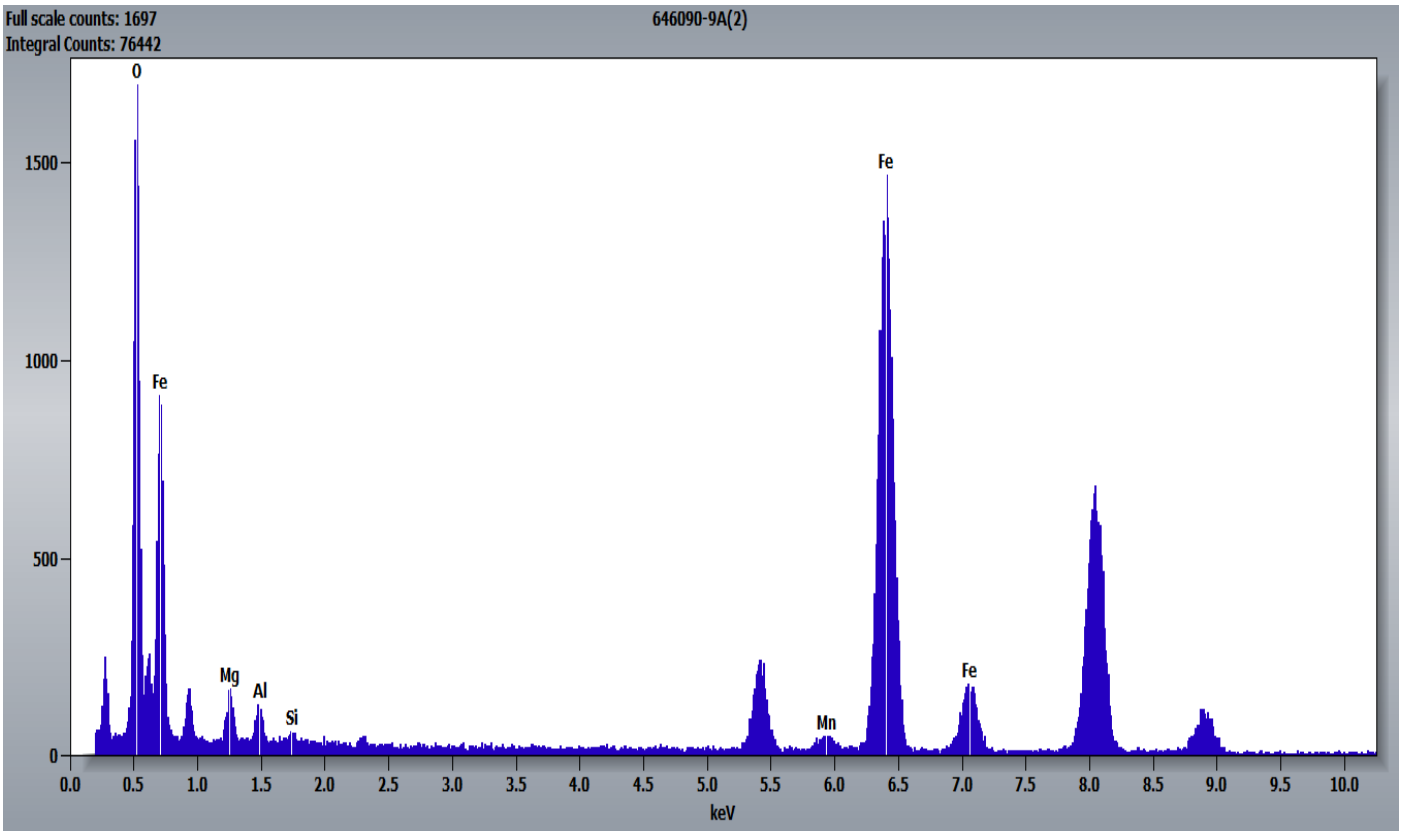


646090 FDA_086.jpg
646090-9A
Iron particles

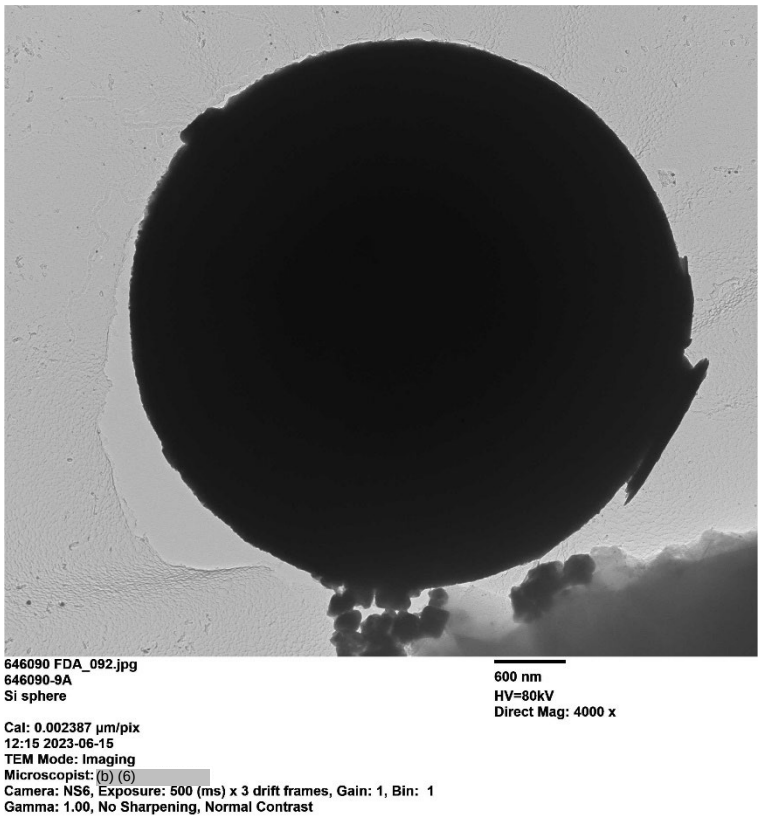
Cal: 0.000477 µm/pix
11:54 2023-06-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

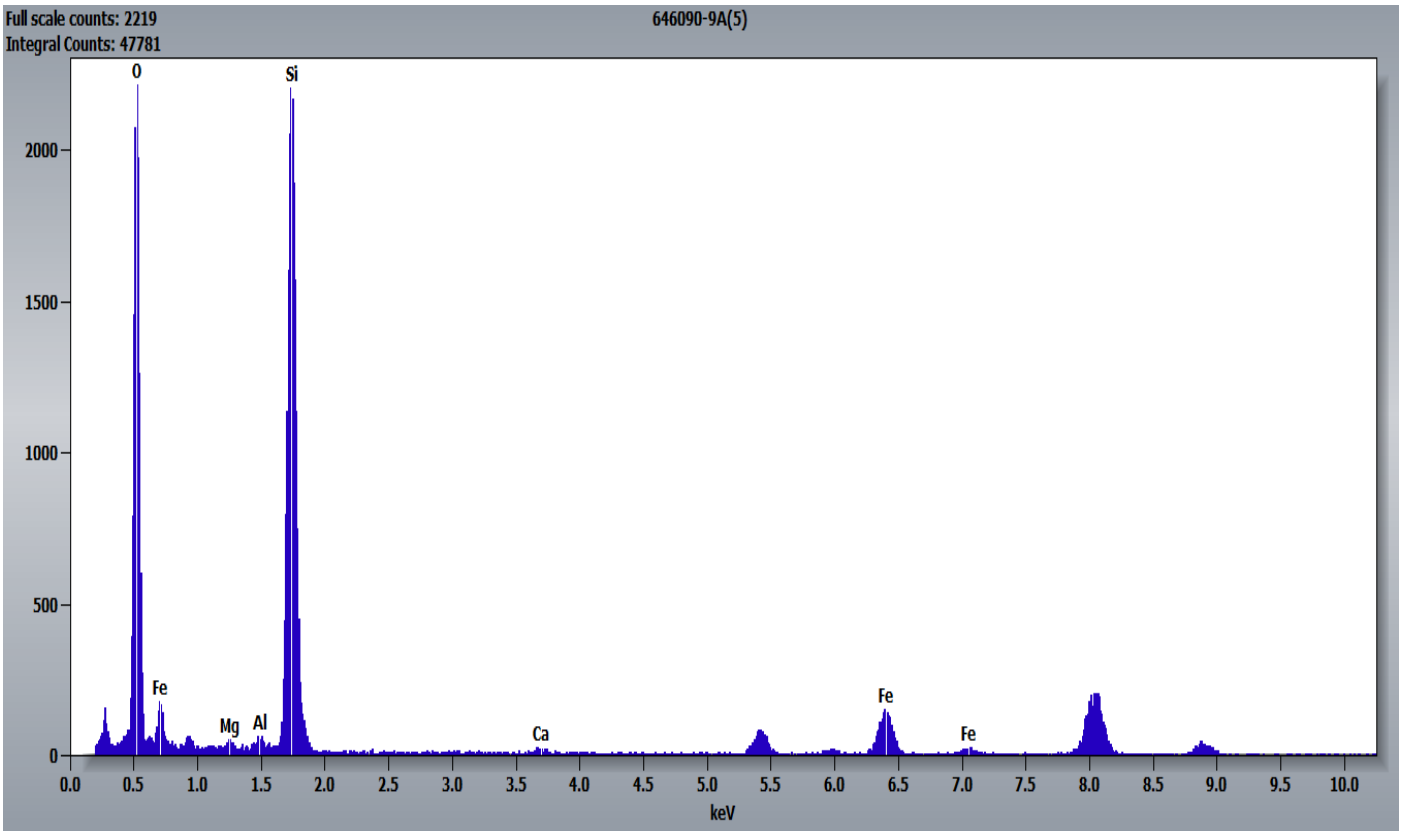
Chemistry from the Iron Particle Pictured Above



646090-9A, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



646090-10A, 10B, 10C/Client Sample: 04032023-10

PLM

All three aliquots of sample 04032023-10 were analyzed by (b) (6) on June 9, 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.

646090-10A	No Asbestos Detected
646090-10B	No Asbestos Detected
646090-10C	No Asbestos Detected

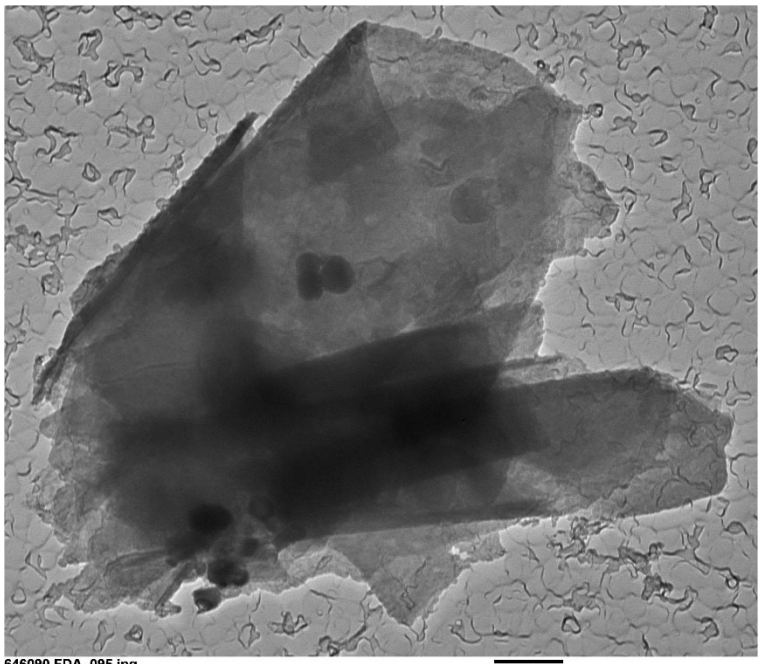
TEM

(b) (6) analyzed aliquot 10A on June 15, 2023. (b) (6) analyzed aliquot 10B on June 19, 2023, and (b) (6) analyzed aliquot 10C on June 19, 2023. The primary particle observed was talc; talc ribbons/fibers, titanium particles, and iron particles were also observed along with mica particles, and particles containing magnesium, aluminum, silicon, and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

646090-10A	No Asbestos Detected
646090-10B	No Asbestos Detected
646090-10C	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.

646090-10A, Talc Particle

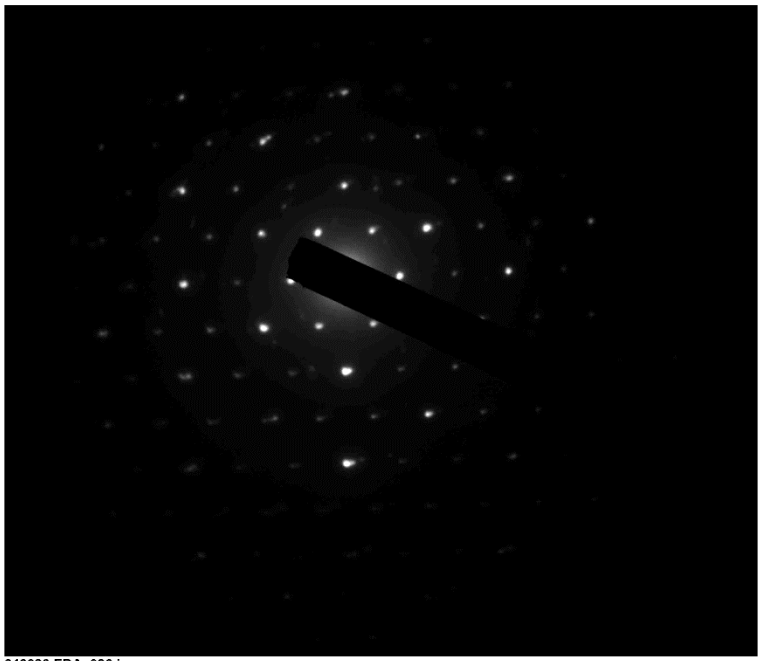


646090 FDA_095.jpg
606090-10a
Talc

Cal: 0.000817 µm/pix
14:56 2023-06-15
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

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

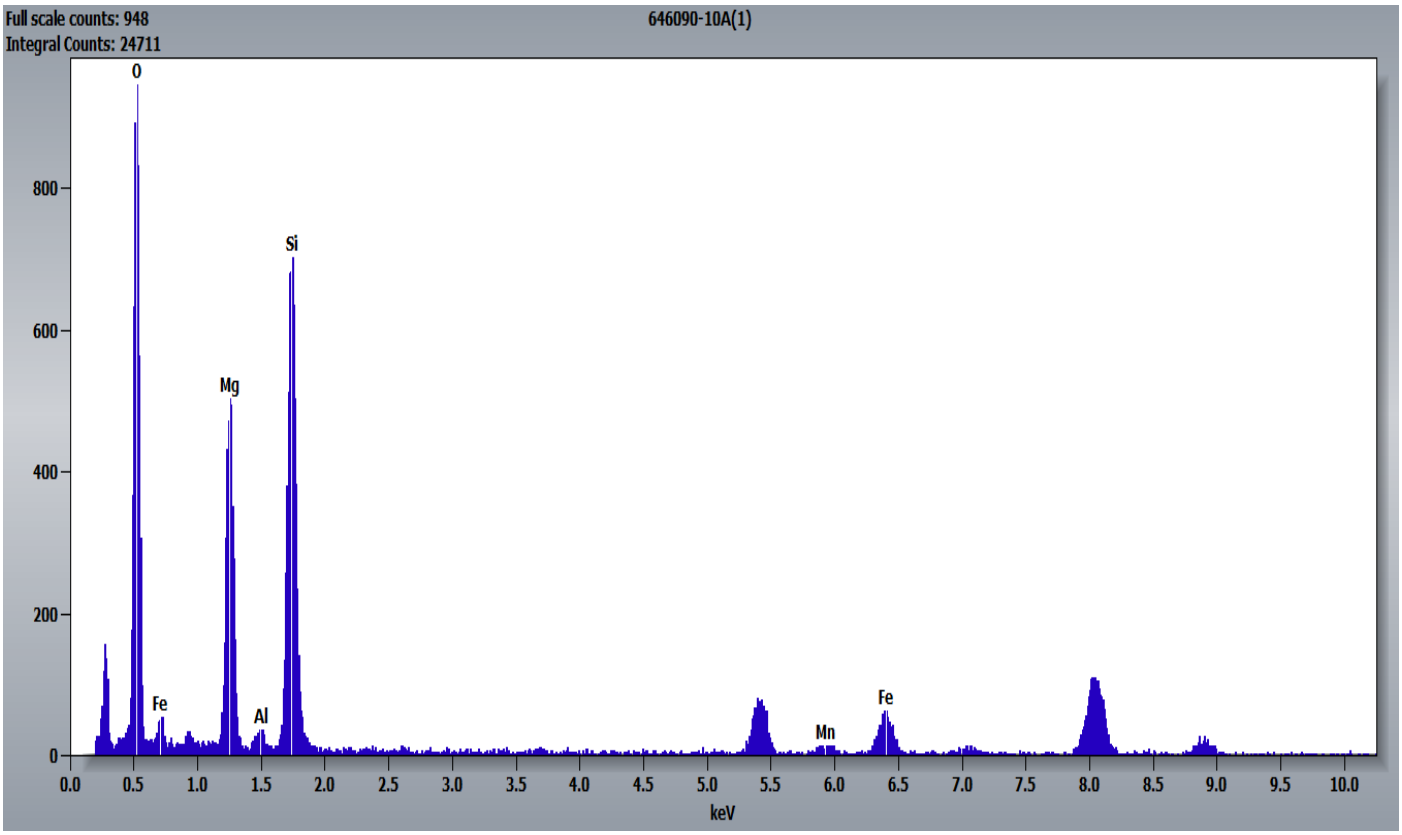


646090 FDA_096.jpg
606090-10a
Talc

Cal: 0.000817 µm/pix
14:59 2023-06-15
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

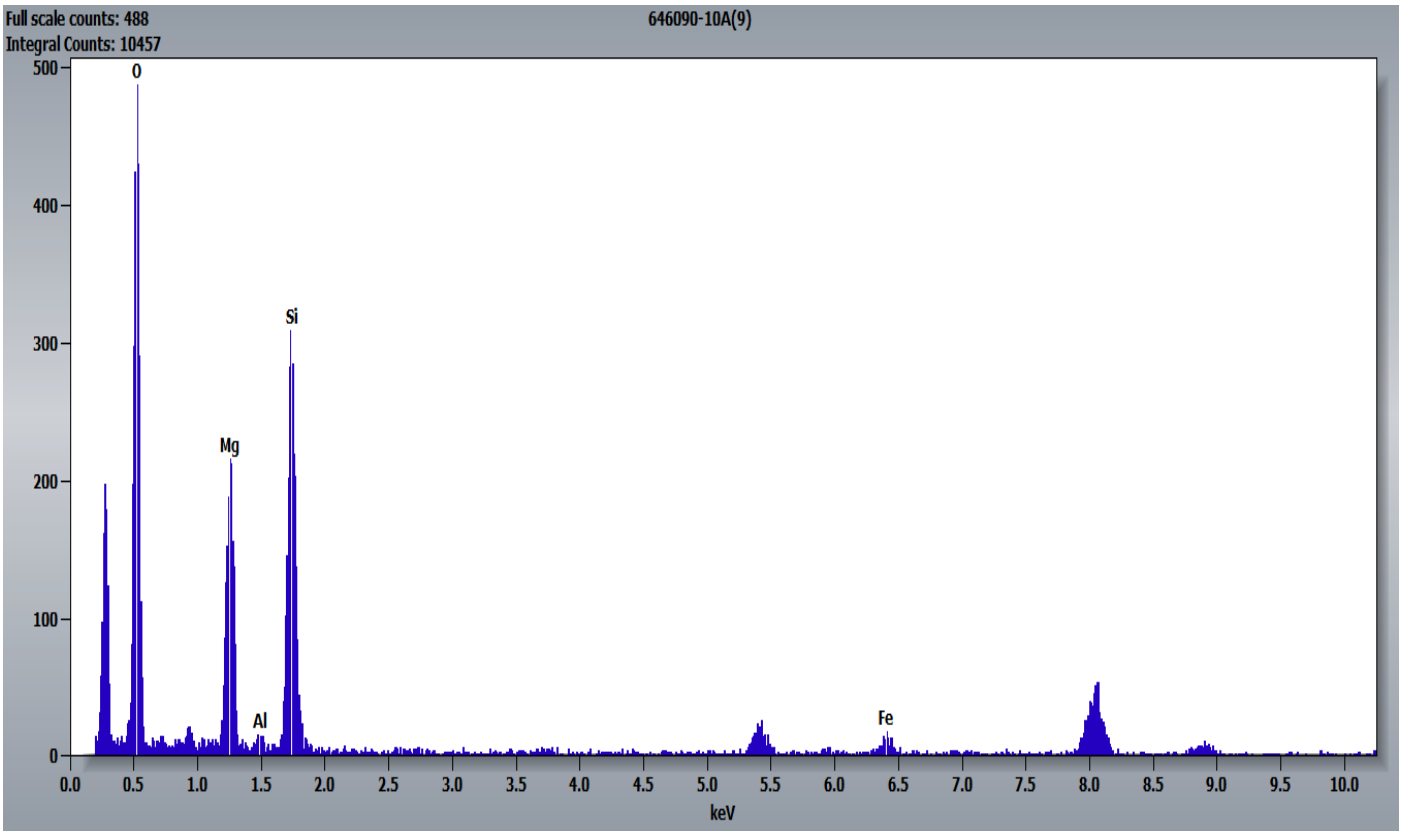
Chemistry from the Talc Particle pictured Above



646090-10A, Elongated Talc Particle

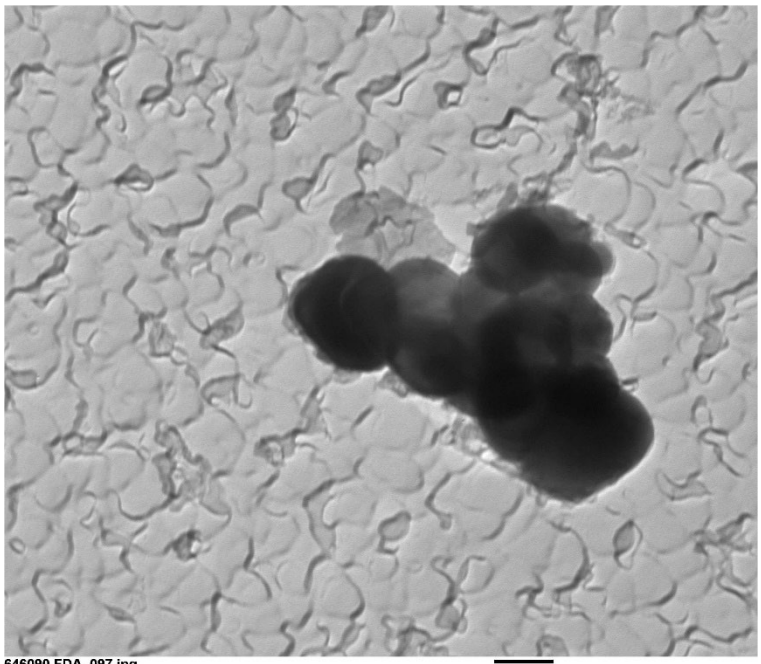
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

Chemistry from the Elongated Talc Particle pictured Above



Asbestos · Lead · Mold · Nano

646090-10A, Titanium Particles

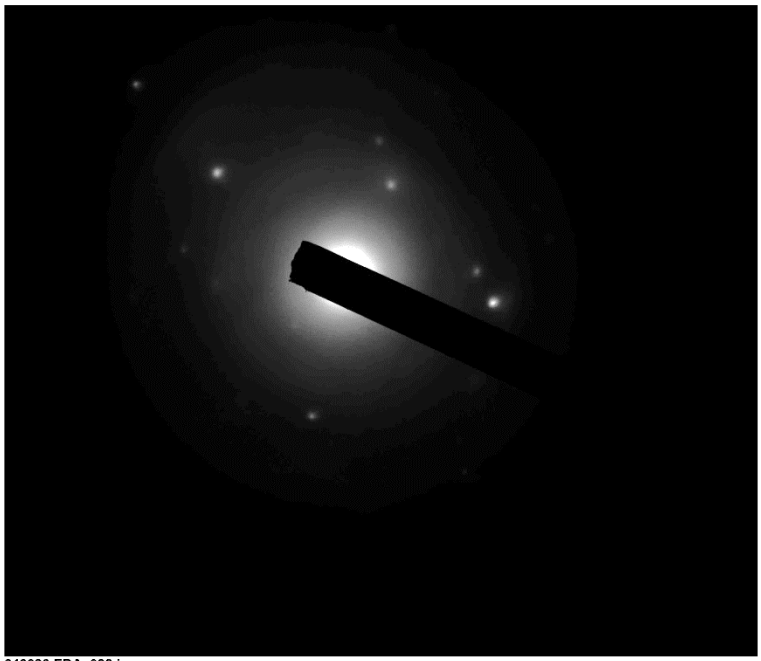


646090 FDA_097.jpg
606090-10a
Ti particles

Cal: 0.000477 µm/pix
15:02 2023-06-15
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

100 nm
HV=80kV
Direct Mag: 20000 x

Diffraction Pattern from the Titanium Particles Pictured Above

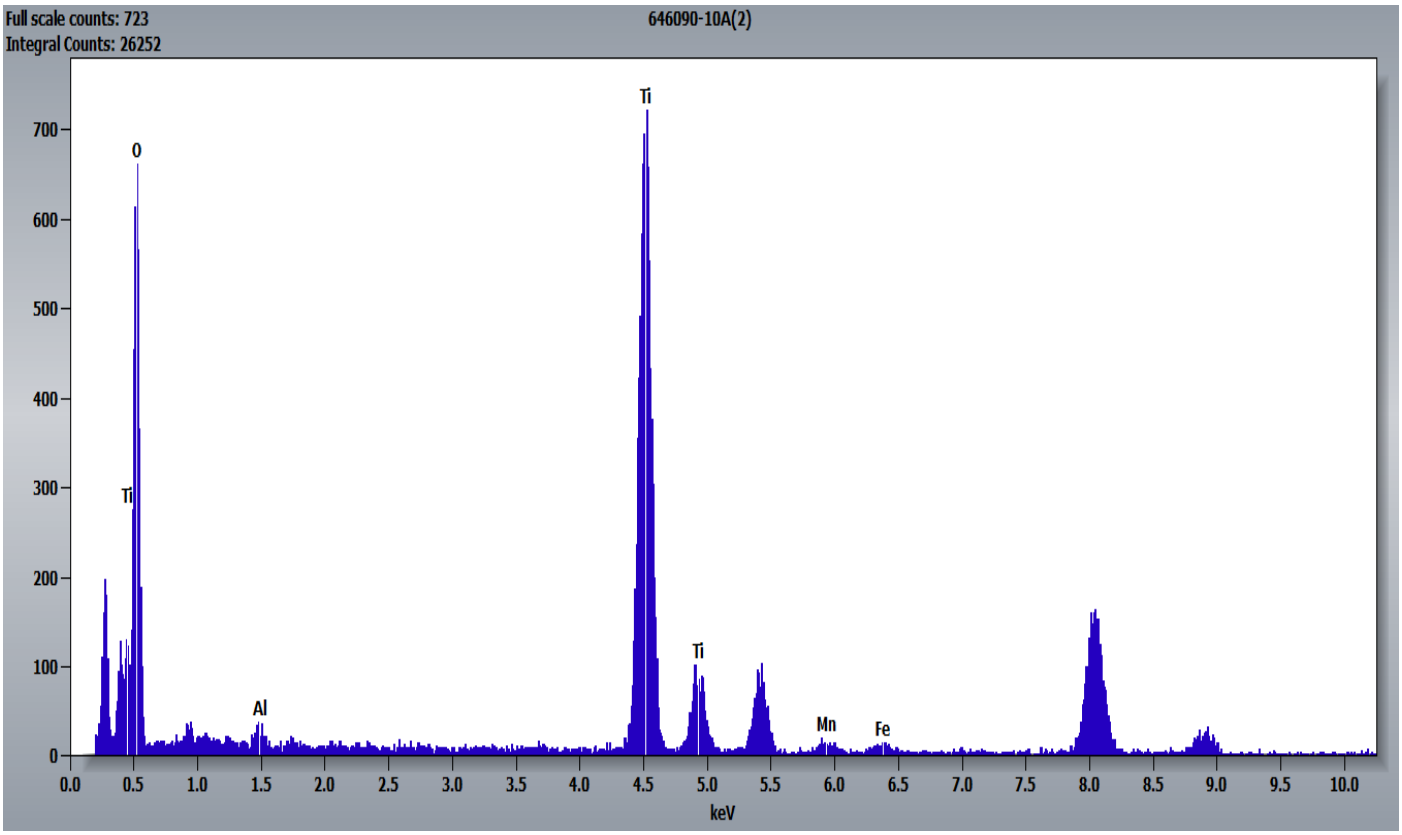


646090 FDA_098.jpg
606090-10a
Ti particles

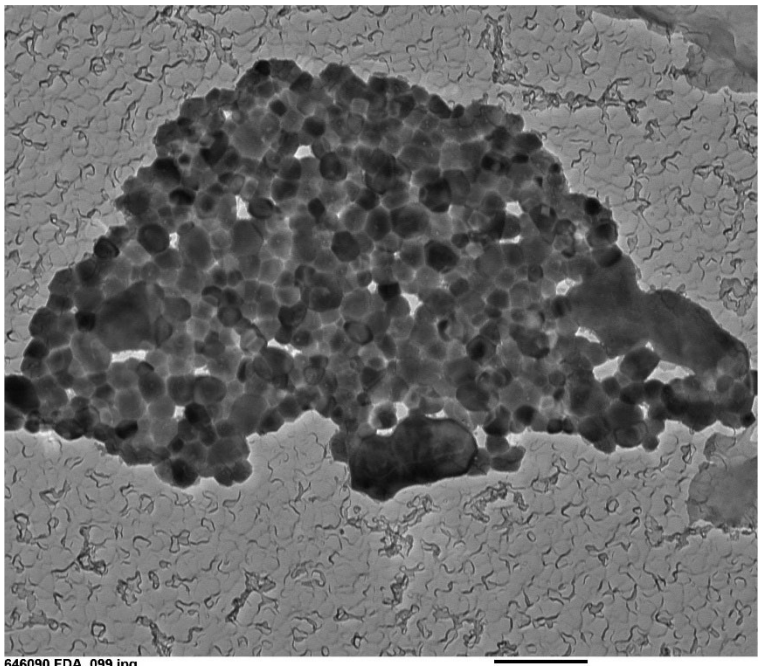
Cal: 0.000477 µm/pix
15:03 2023-06-15
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Titanium Particles pictured Above

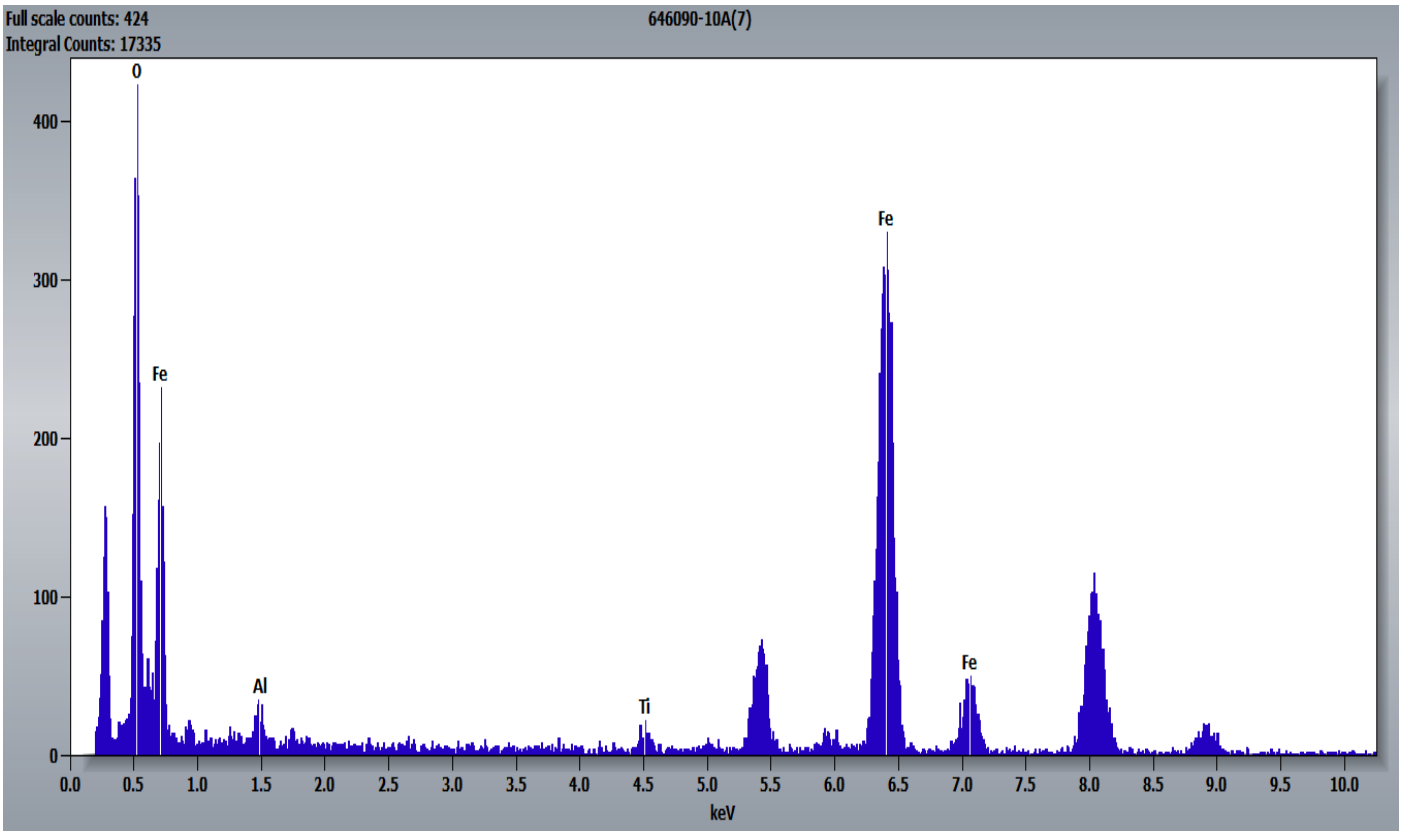


646090-10A, Iron Particles

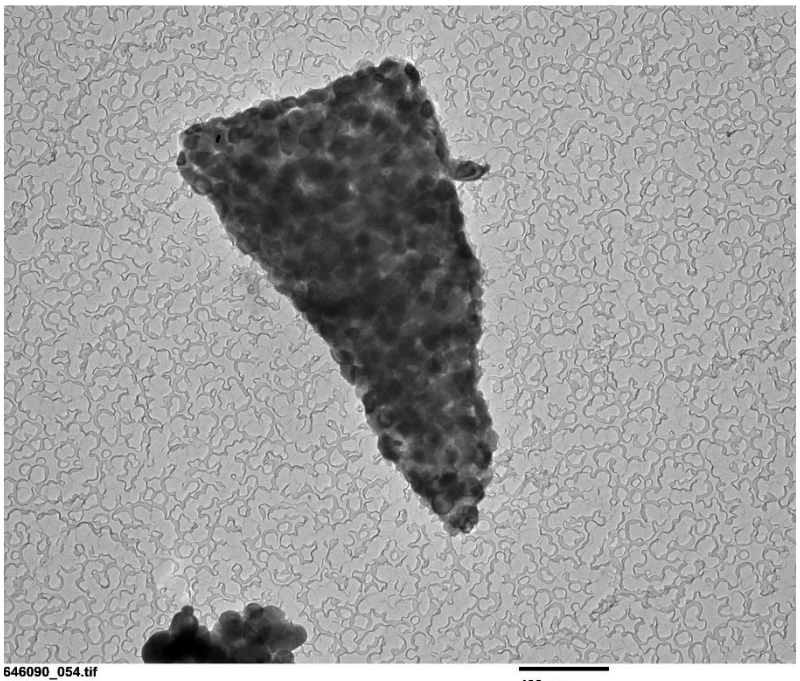


Diffraction Pattern from the Iron Particles Pictured Above

Chemistry from the Iron Particles pictured Above



646090-10B, Mica Particle

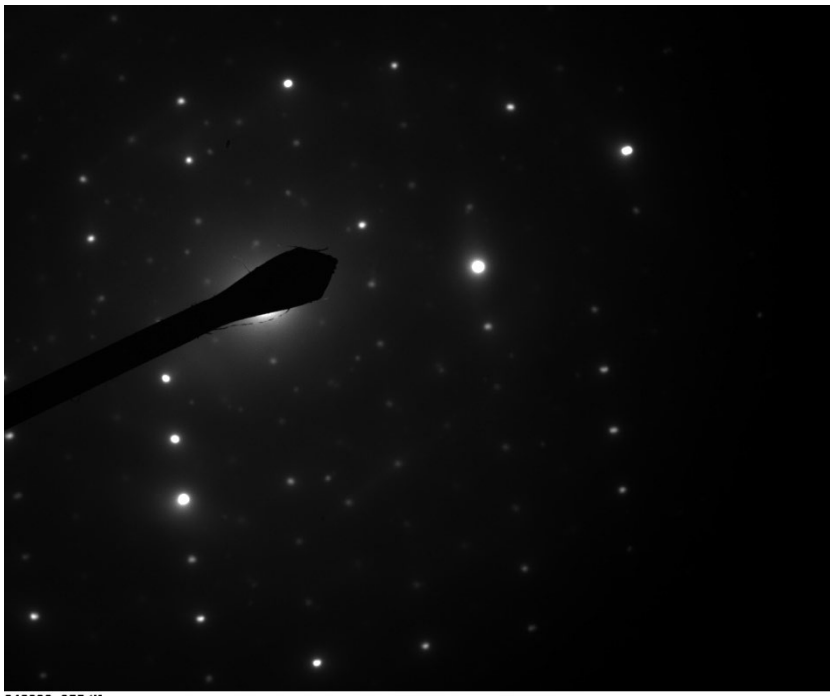


646090_054.tif
Mica

Cal: 0.001430 µm/pix
10:41 2023-06-19
TEM Mode: Imaging
Microscopist
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

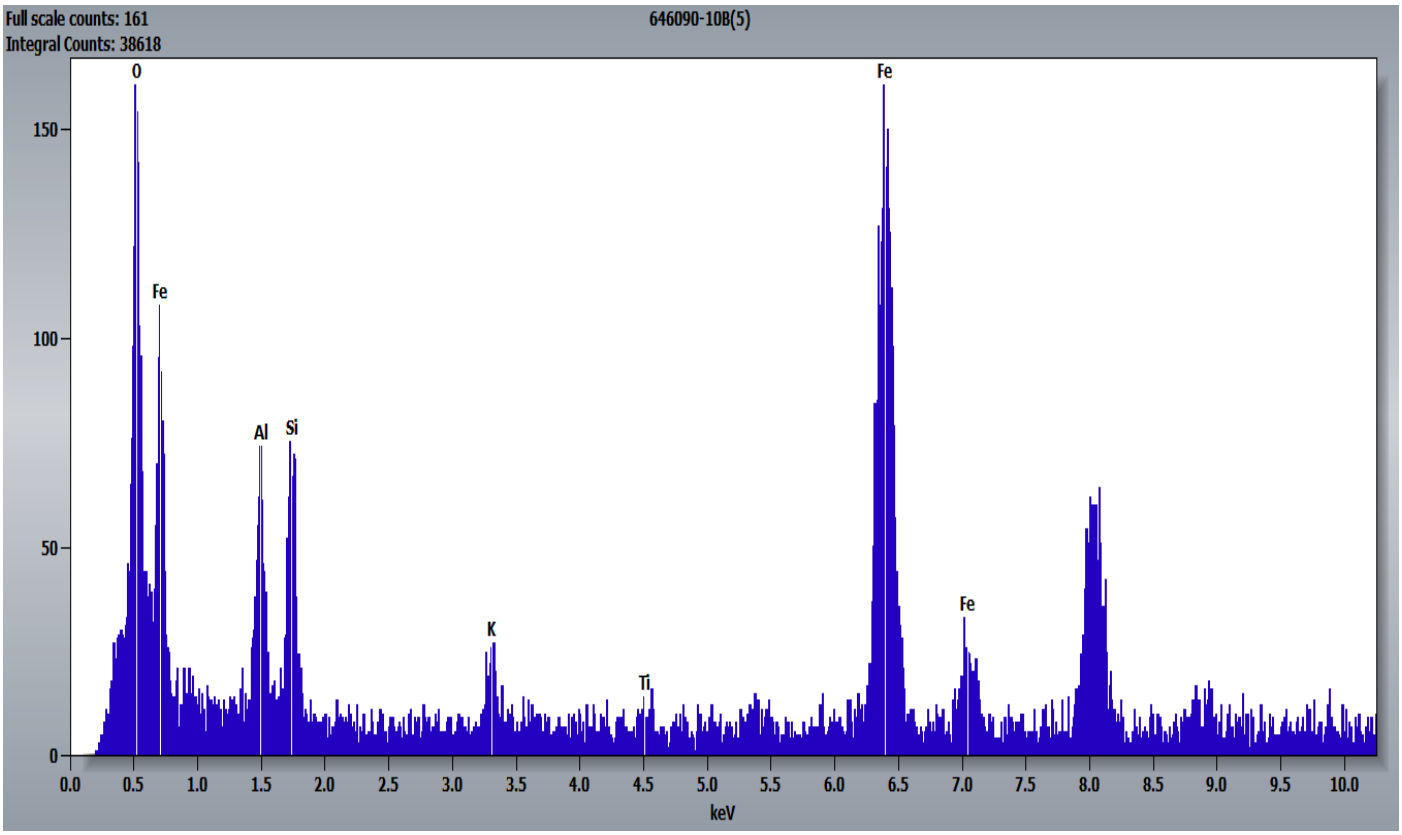


646090_055.tif

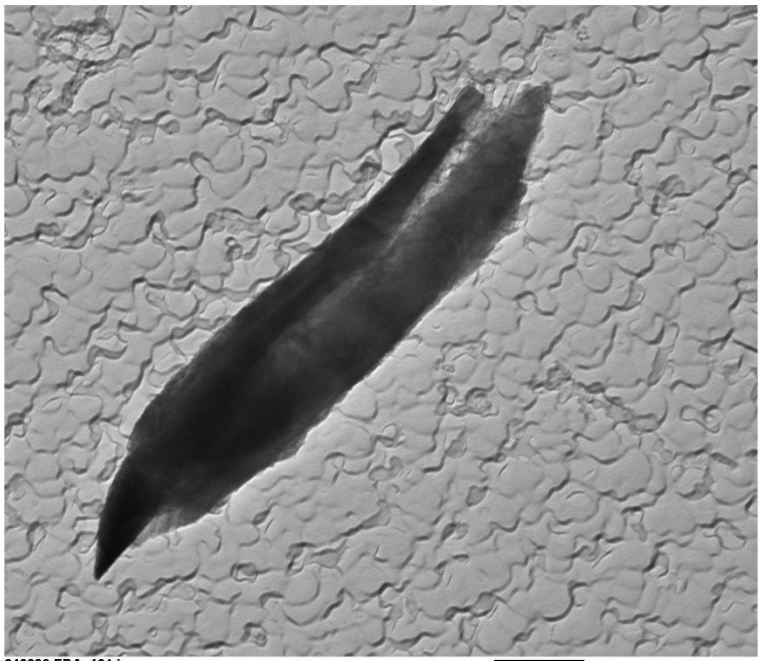
11:13 2023-06-19
TEM Mode: Diffraction
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Mica Particle pictured Above



646090-10A, Particle Containing Magnesium, Aluminum, Silicon, and Iron

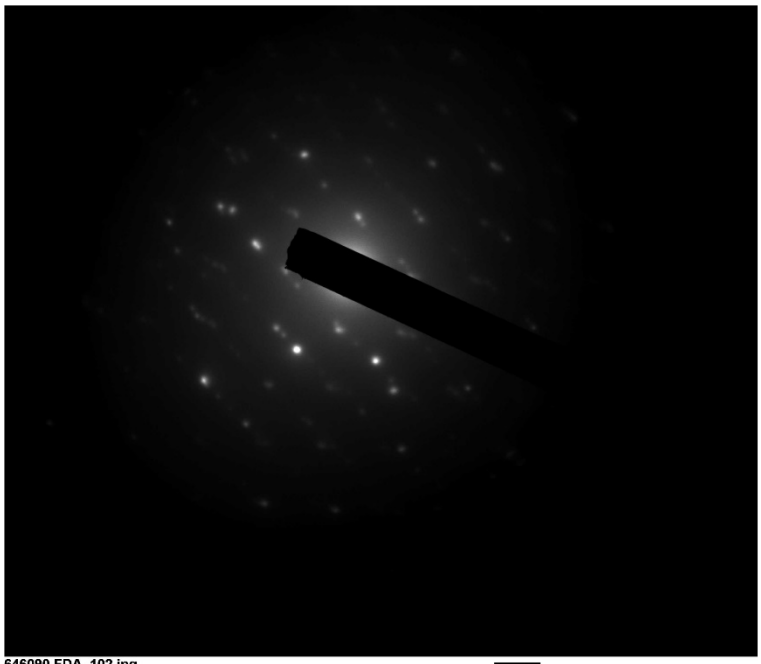


646090 FDA_101.jpg
606090-10a
O,Mg,Al,Si,Fe particle

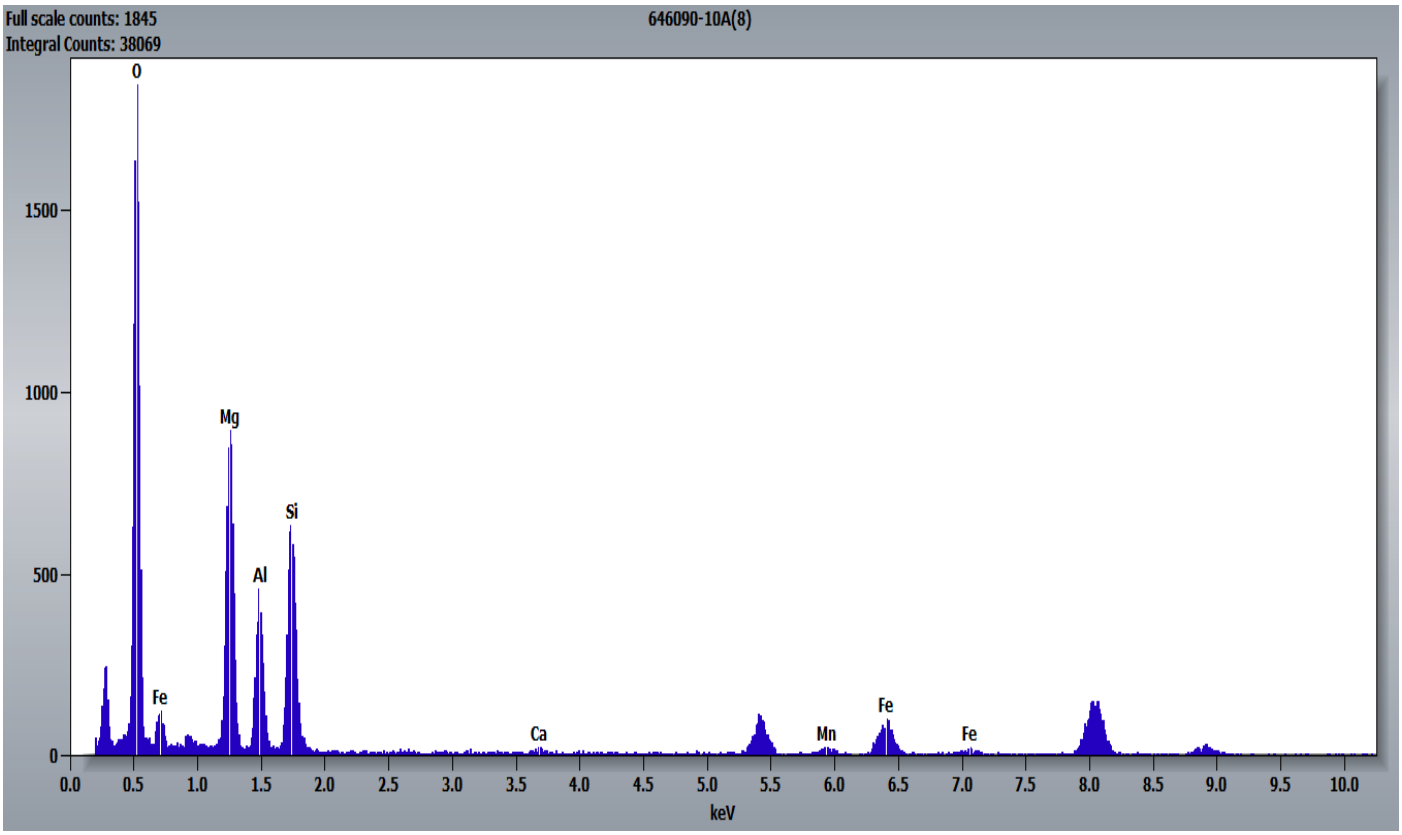
Cal: 0.000626 µm/pix
15:24 2023-06-15
TEM Mode: Imaging
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=80kV
Direct Mag: 15000 x

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



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



646090-11A, 11B, 11C/Client Sample: 04032023-11

PLM

All three aliquots of sample 04032023-11 were analyzed by (b) (6) on June 9, 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.

646090-11A	No Asbestos Detected
646090-11B	No Asbestos Detected
646090-11C	No Asbestos Detected

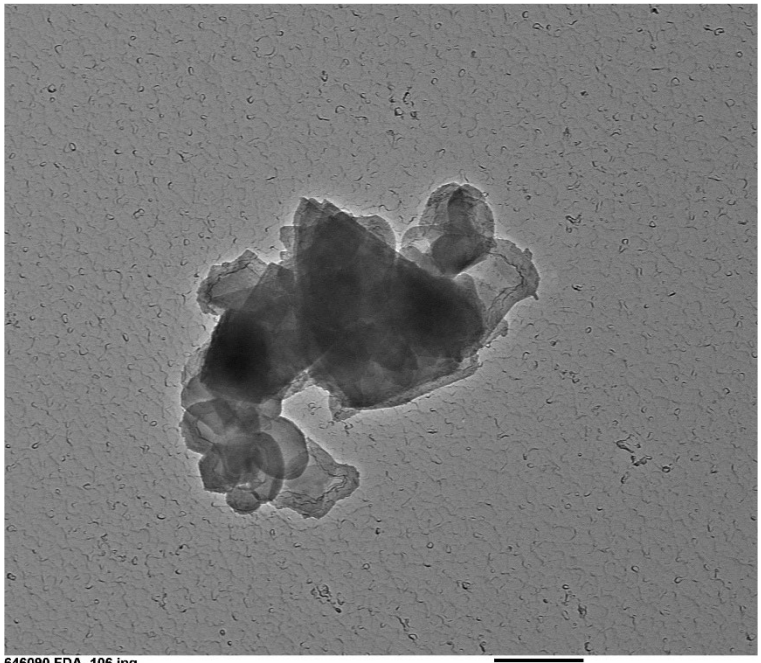
TEM

(b) (6) analyzed aliquot 11A on June 16, 2023. (b) (6) analyzed aliquot 11B on June 19, 2023, and (b) (6) analyzed aliquot 11C on June 19, 2023. The primary particle observed was talc; iron and aluminum particles were also observed along with talc ribbons/fibers, and particles containing magnesium, aluminum, silicon, and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

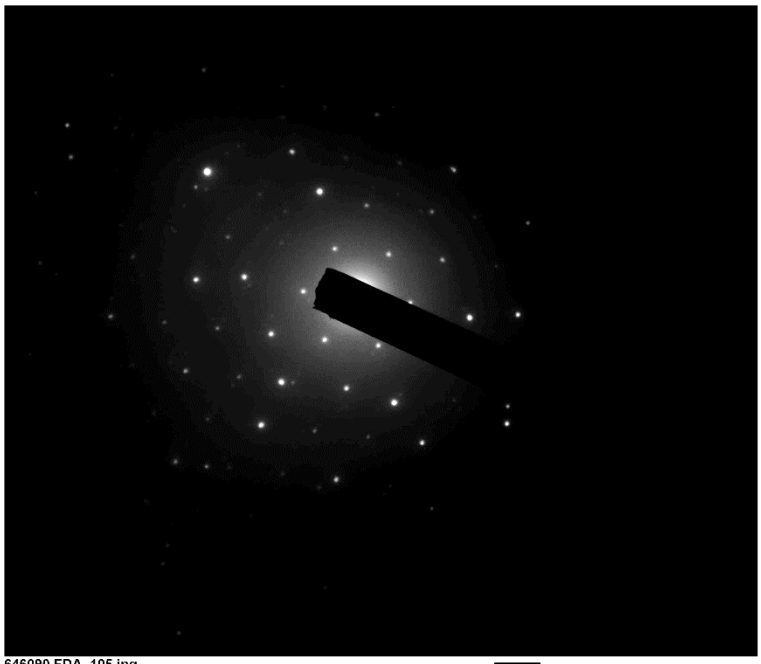
646090-11A	No Asbestos Detected
646090-11B	No Asbestos Detected
646090-11C	No Asbestos Detected

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.

646090-11A, Talc Particle



Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

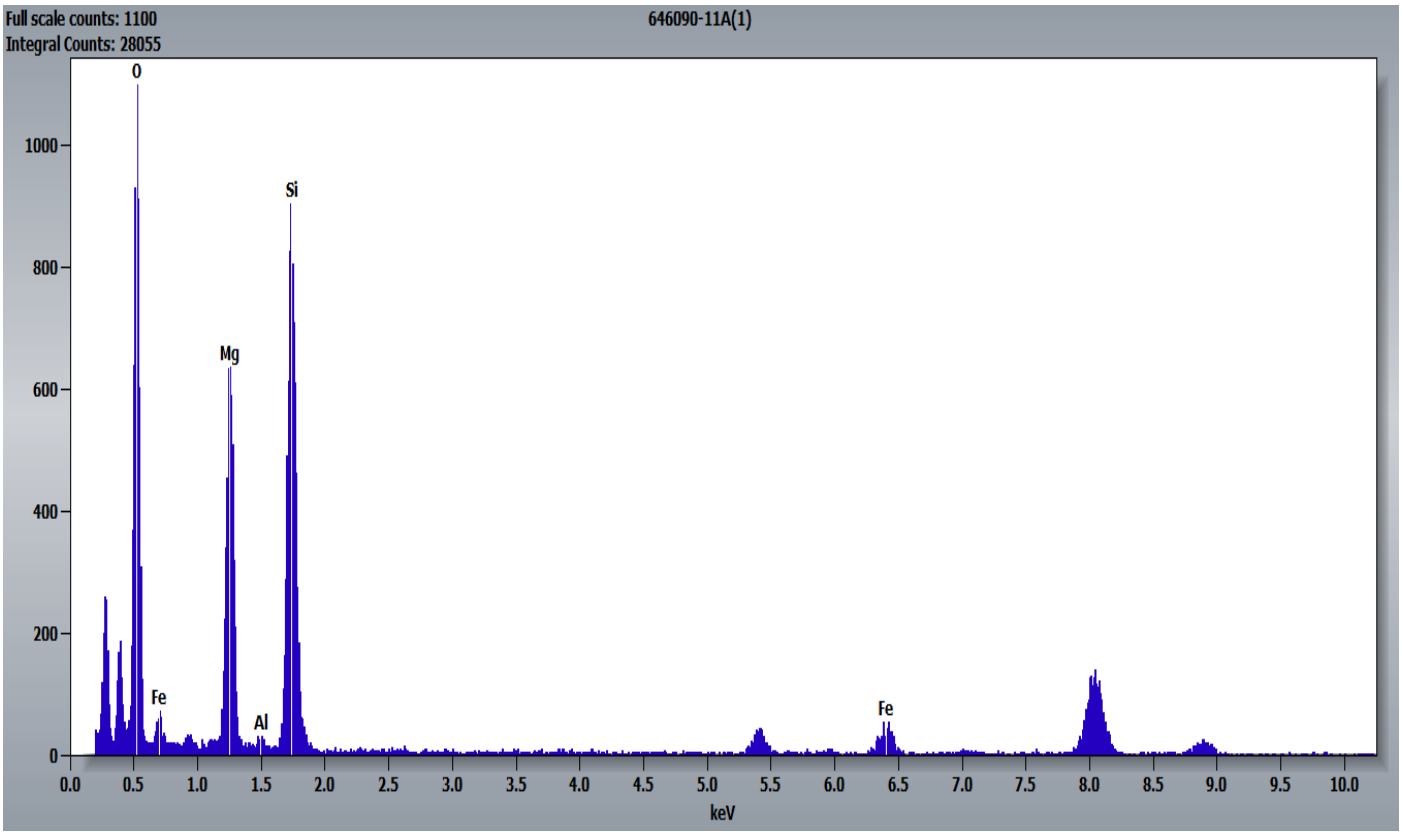


646090 FDA_105.jpg
646090-11A
Talc Particle

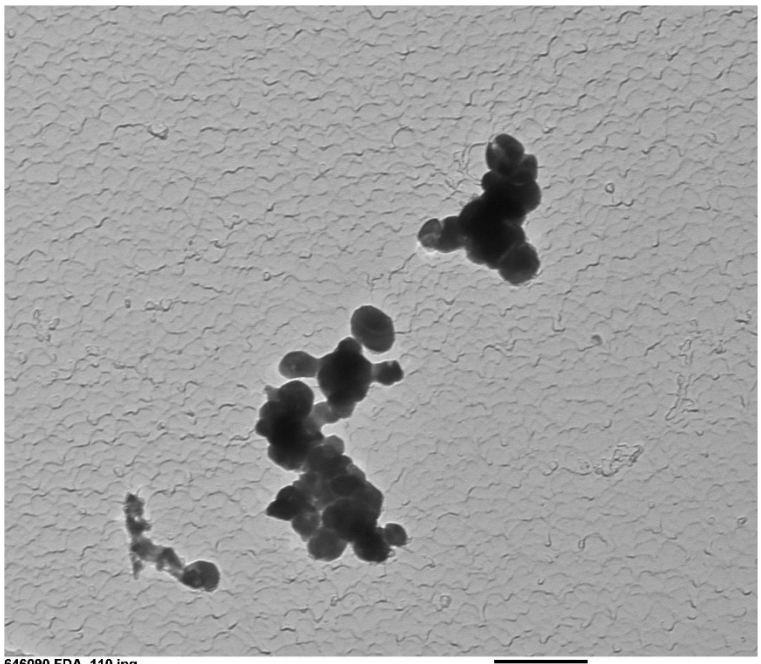
0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

10:12 2023-06-16
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

Chemistry from the Talc Particle Pictured Above



646090-11A, Iron Particles

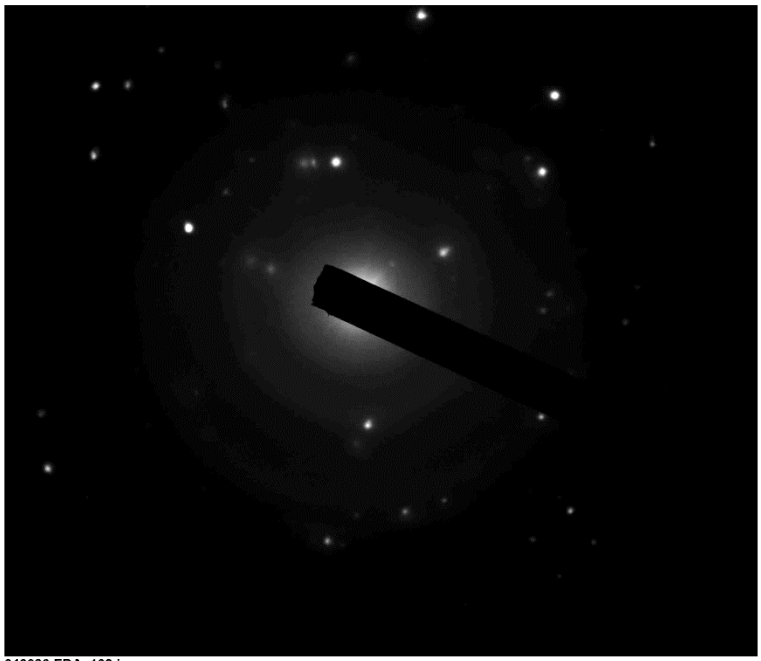


646090 FDA_110.jpg
646090-11A
Fe particles

Cal: 0.001209 µm/pix
10:19 2023-06-16
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

400 nm
HV=80kV
Direct Mag: 8000 x

Diffraction Pattern from the Iron Particles Pictured Above

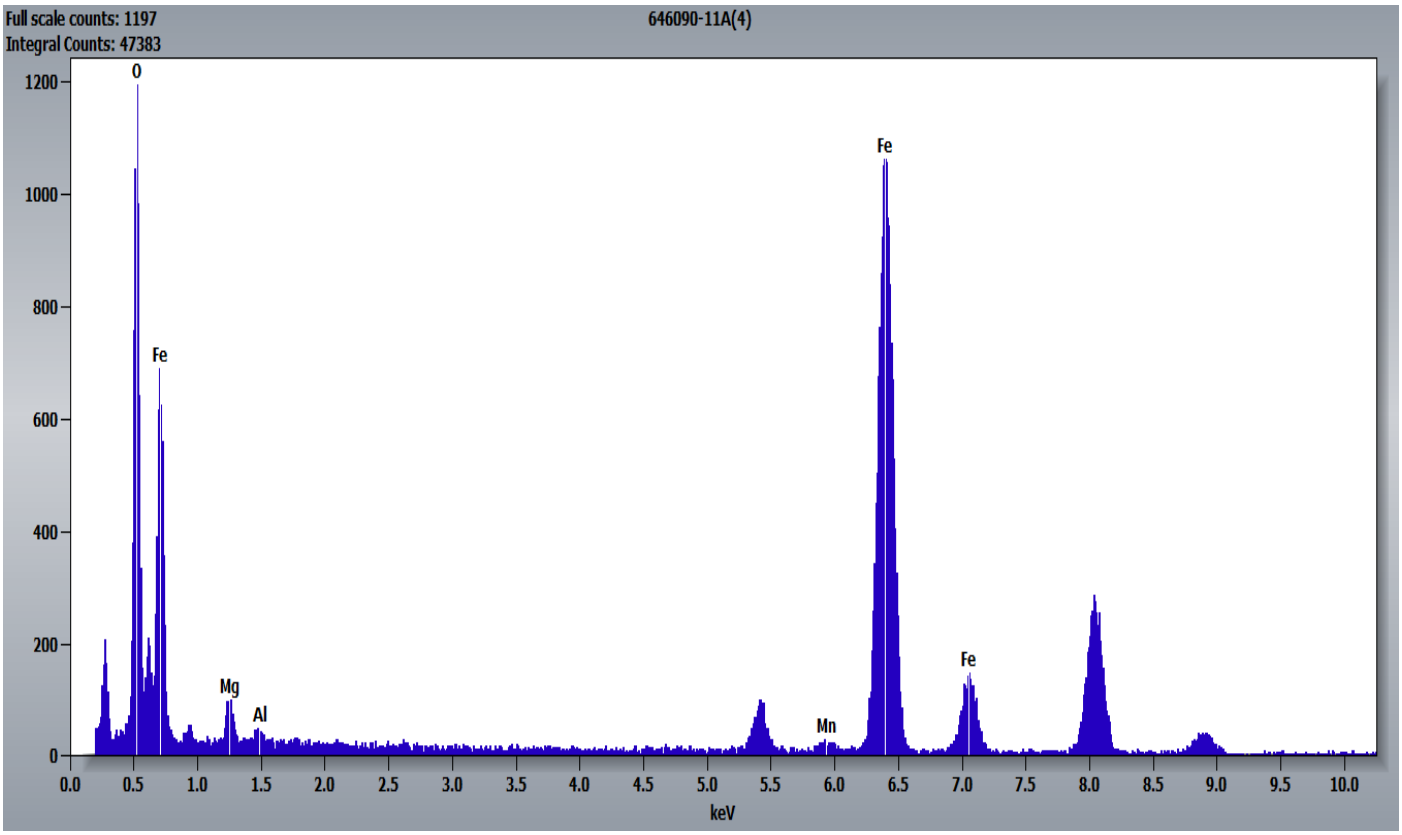


646090 FDA_109.jpg
646090-11A
Fe particles

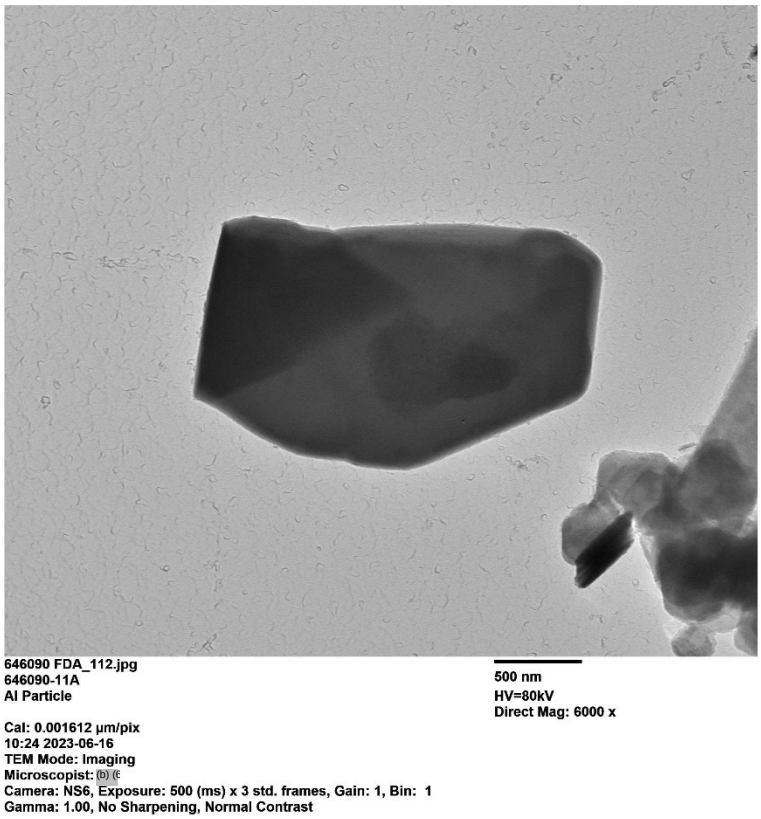
Cal: 0.000817 µm/pix
10:19 2023-06-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

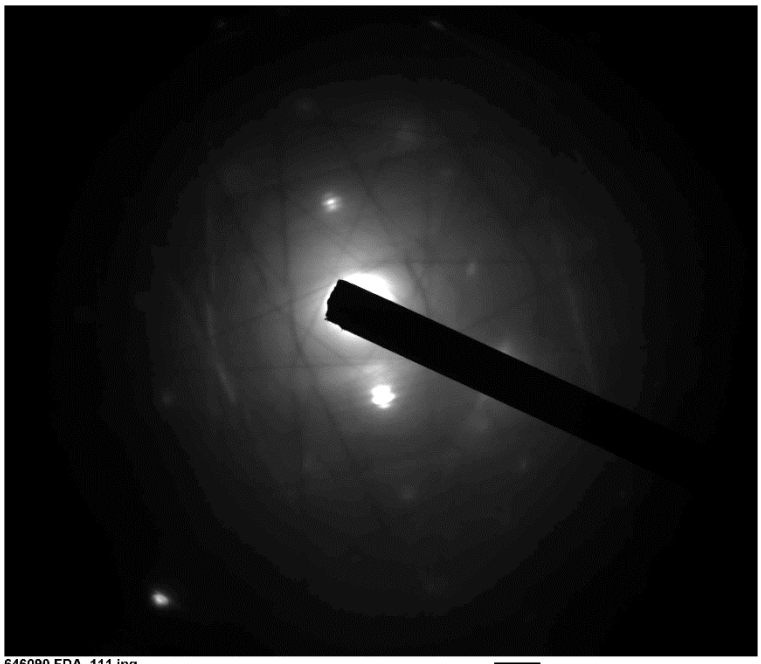
Chemistry from the Iron Particles Pictured Above



646090-11A, Aluminum Particle



Diffraction Pattern from the Aluminum Particle Pictured Above

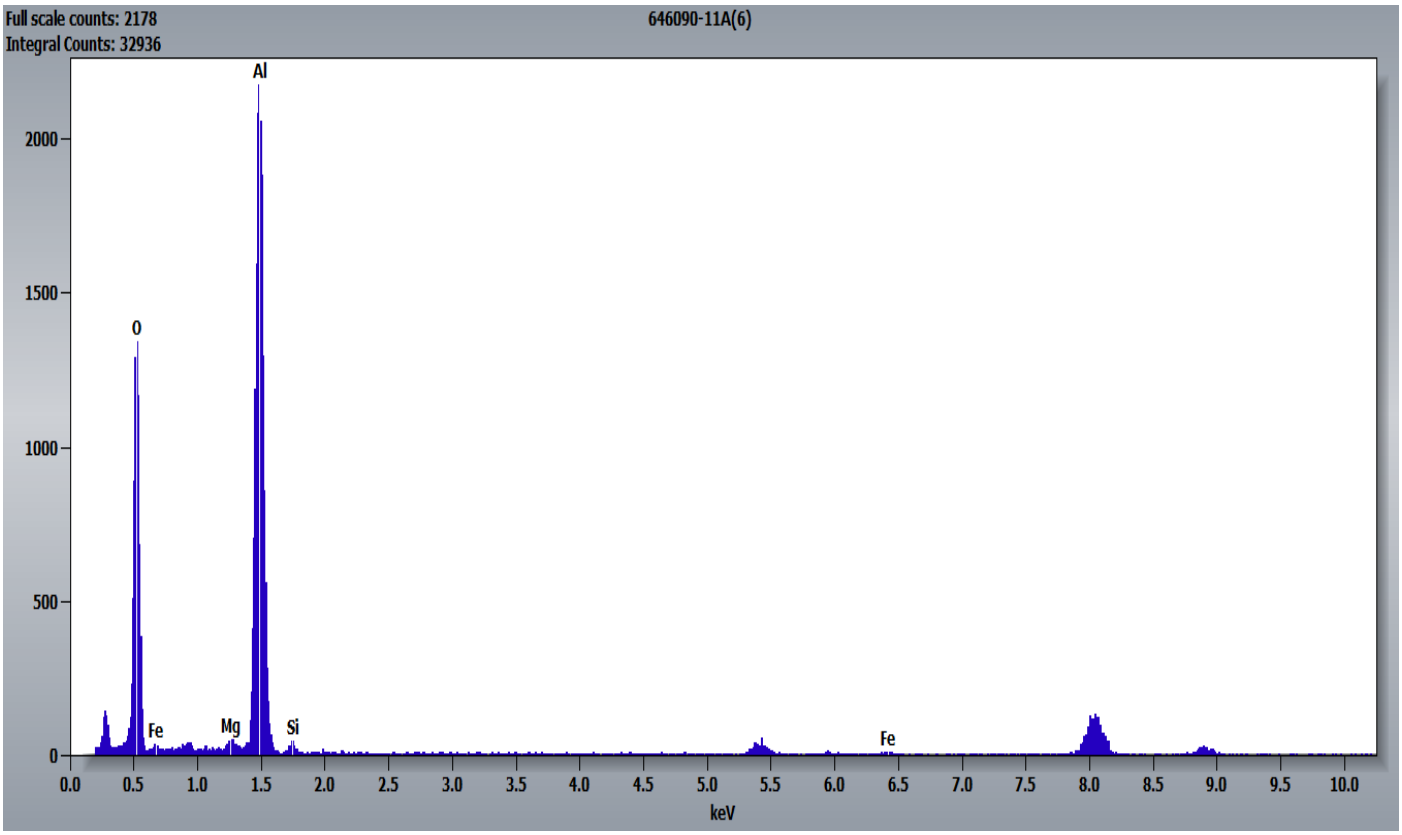


646090 FDA_111.jpg
646090-11A
Al Particle

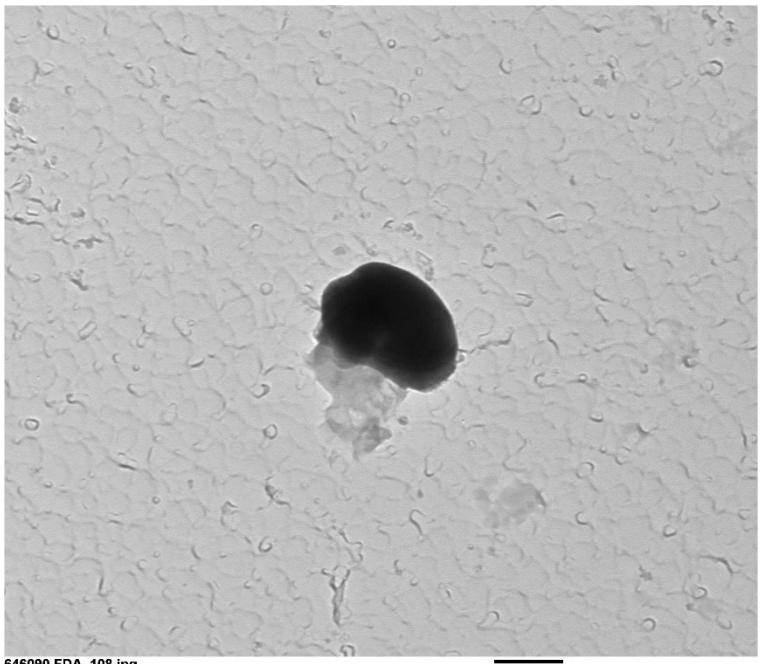
Cal: 0.001209 µm/pix
10:23 2023-06-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Aluminum Particle Pictured Above



646090-11A, Particle Containing Aluminum and Titanium

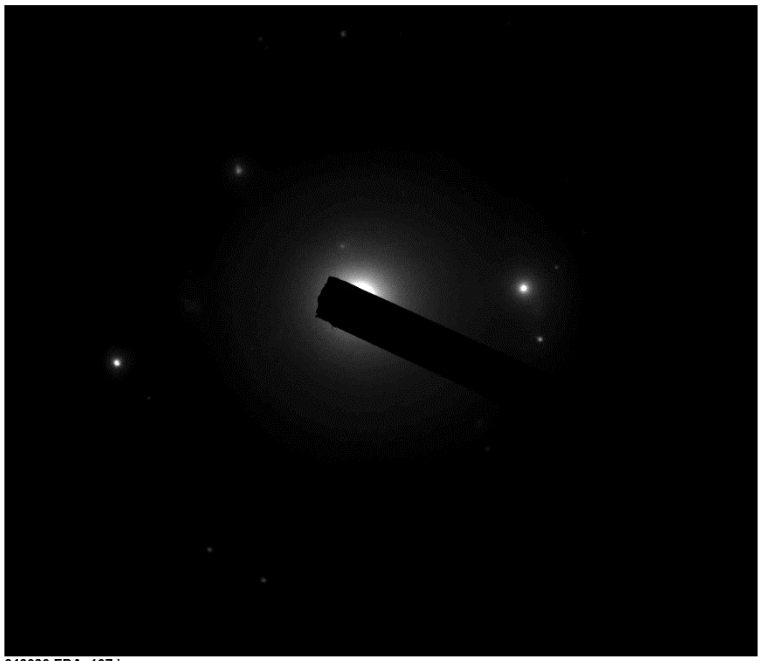


646090 FDA_108.jpg
646090-11A
Al,Ti particle

Cal: 0.000817 µm/pix
10:14 2023-06-16
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

200 nm
HV=80kV
Direct Mag: 12000 x

Diffraction Pattern from the Particle Containing Aluminum and Titanium Pictured Above

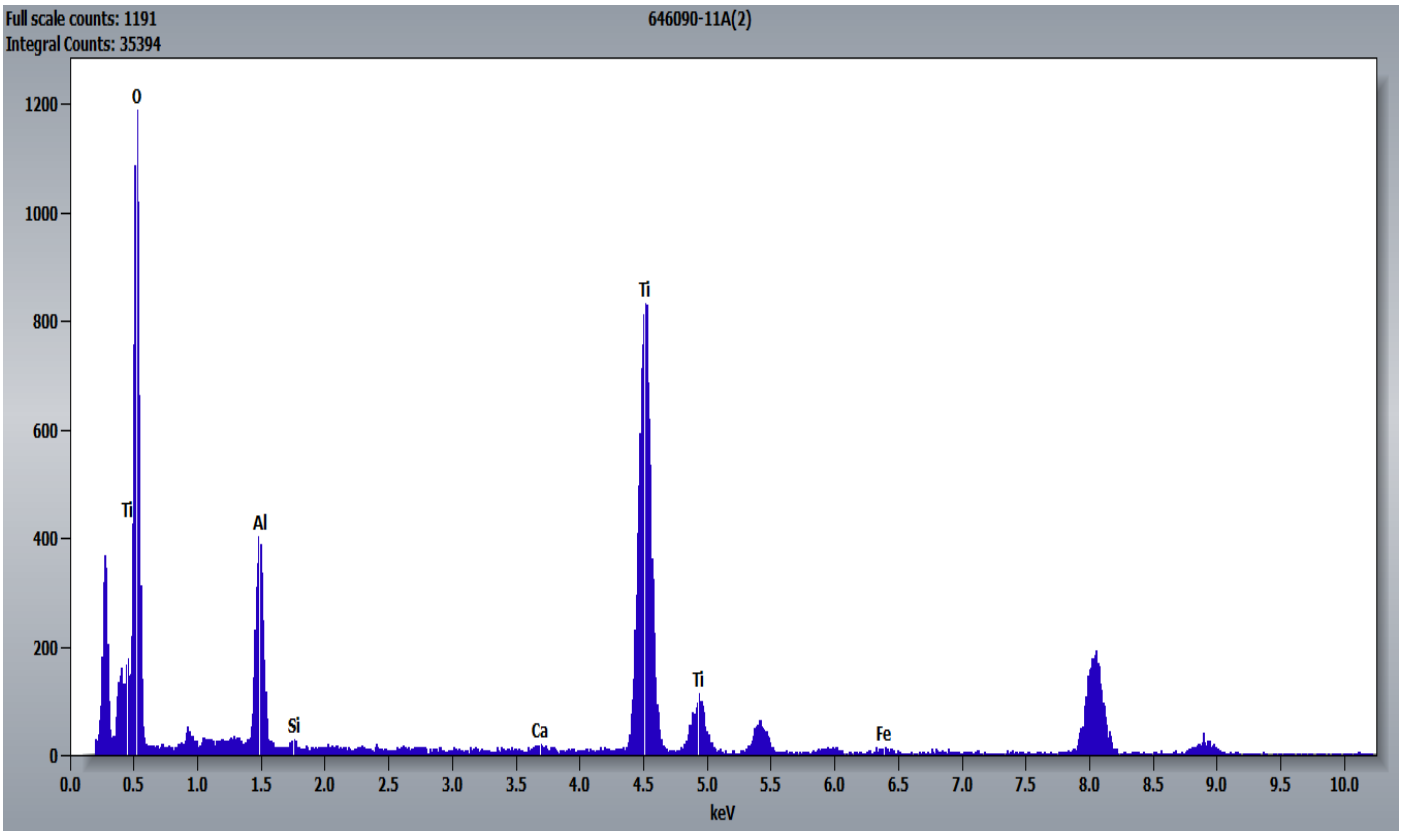


646090 FDA_107.jpg
646090-11A
Al,Ti particle

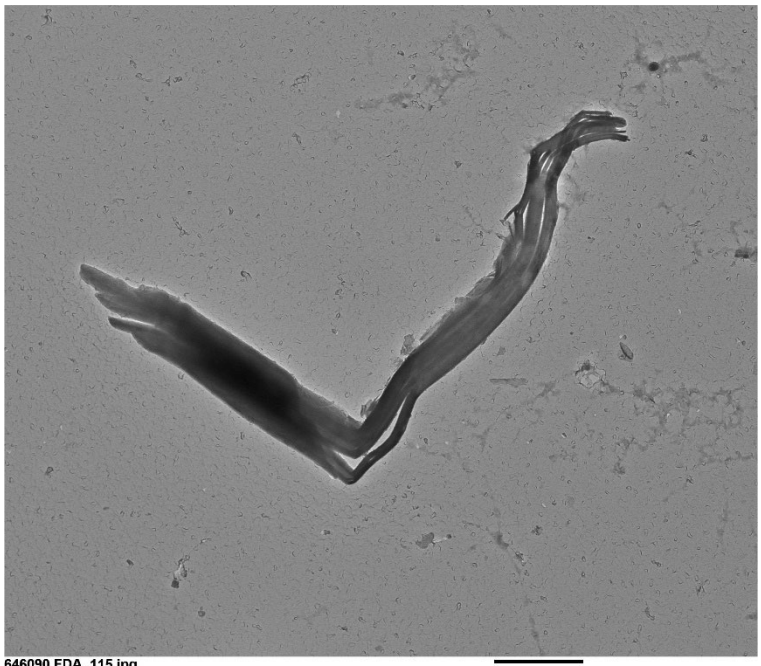
Cal: 0.001905 µm/pix
10:14 2023-06-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Particle Containing Aluminum and Titanium Pictured Above



646090-11A, Talc Ribbon

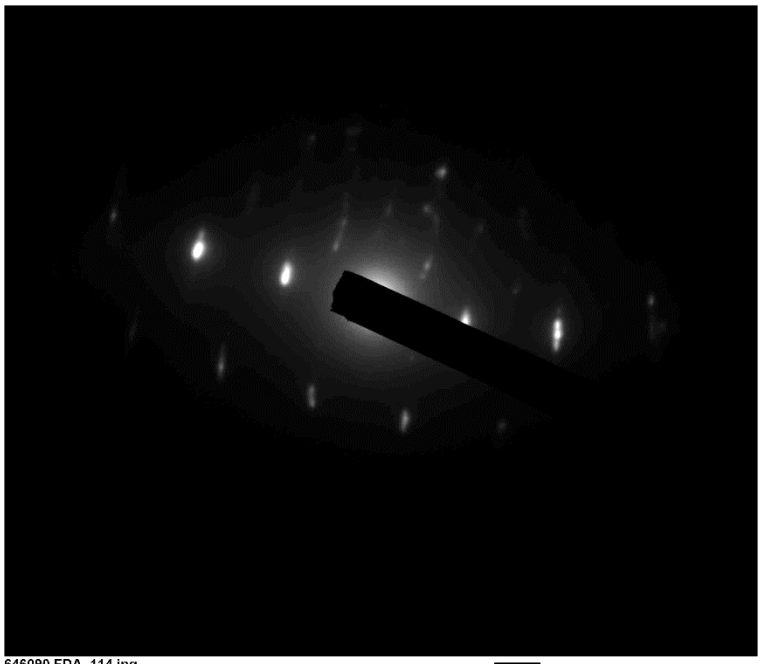


646090 FDA_115.jpg
646090-11A
Talc Ribbon

Cal: 0.003183 µm/pix
11:16 2023-06-16
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

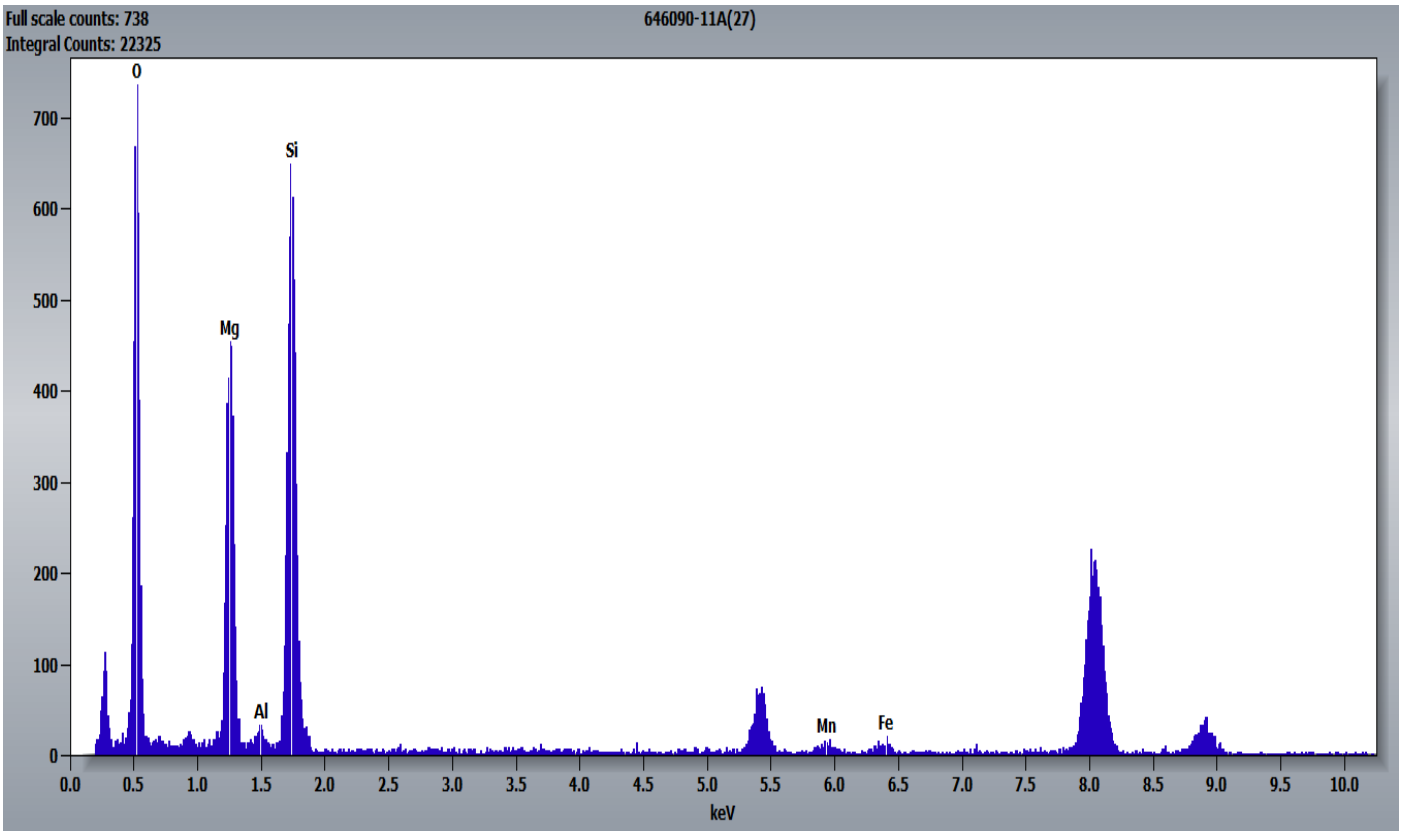


646090 FDA_114.jpg
646090-11A
Talc Ribbon

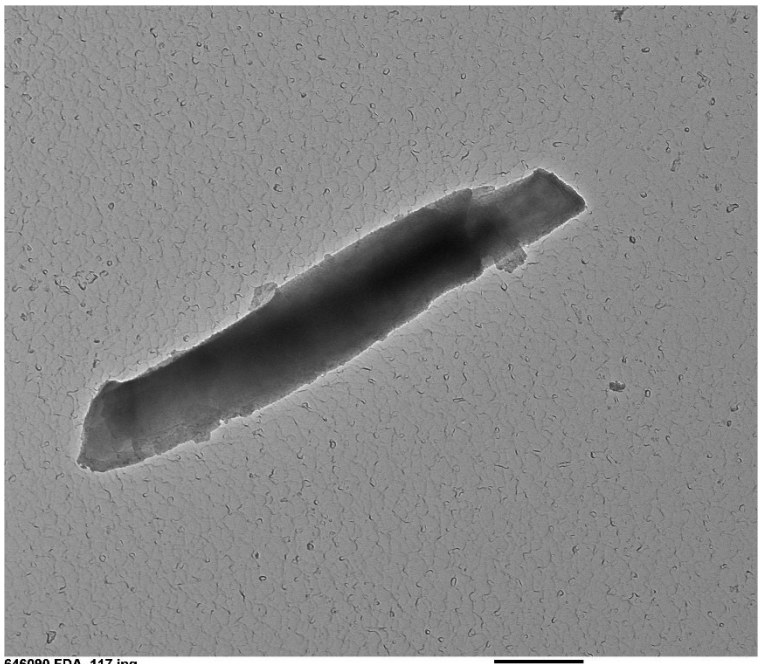
Cal: 0.001209 µm/pix
11:15 2023-06-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

Chemistry from the Talc Ribbon Pictured Above



646090-11A, Elongated Talc Particle

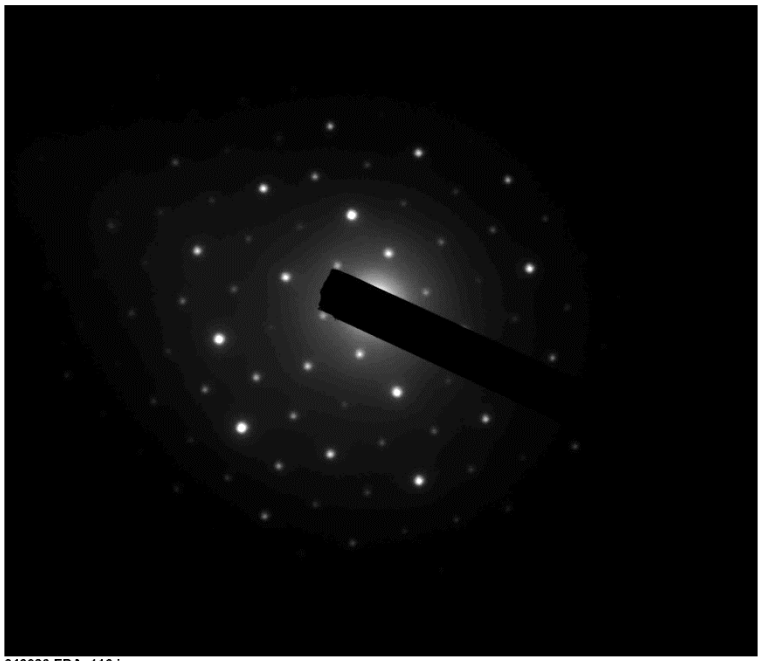


646090 FDA_117.jpg
646090-11A
Talc Fiber

Cal: 0.001905 µm/pix
11:21 2023-06-16
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

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

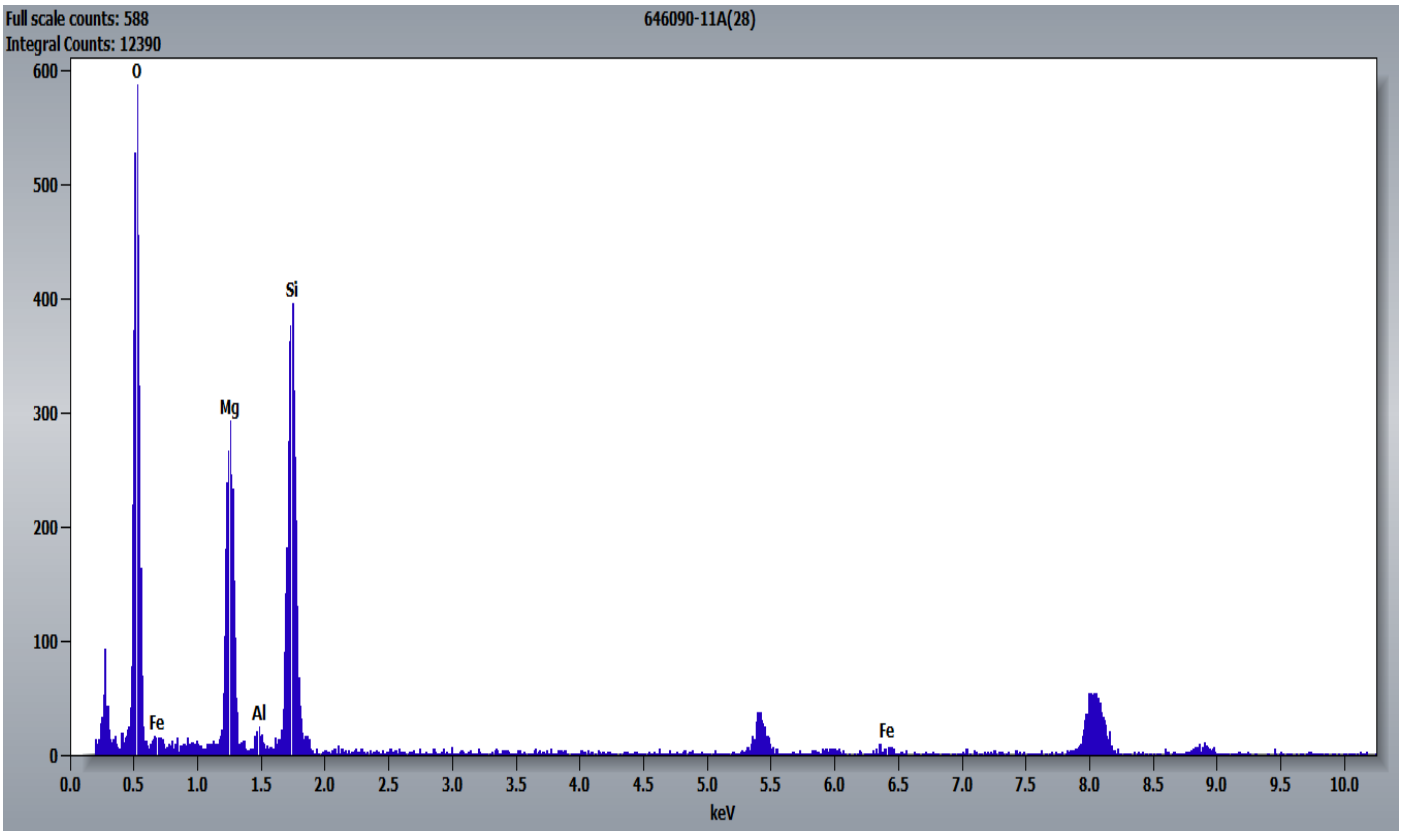


646090 FDA_116.jpg
646090-11A
Talc Fiber

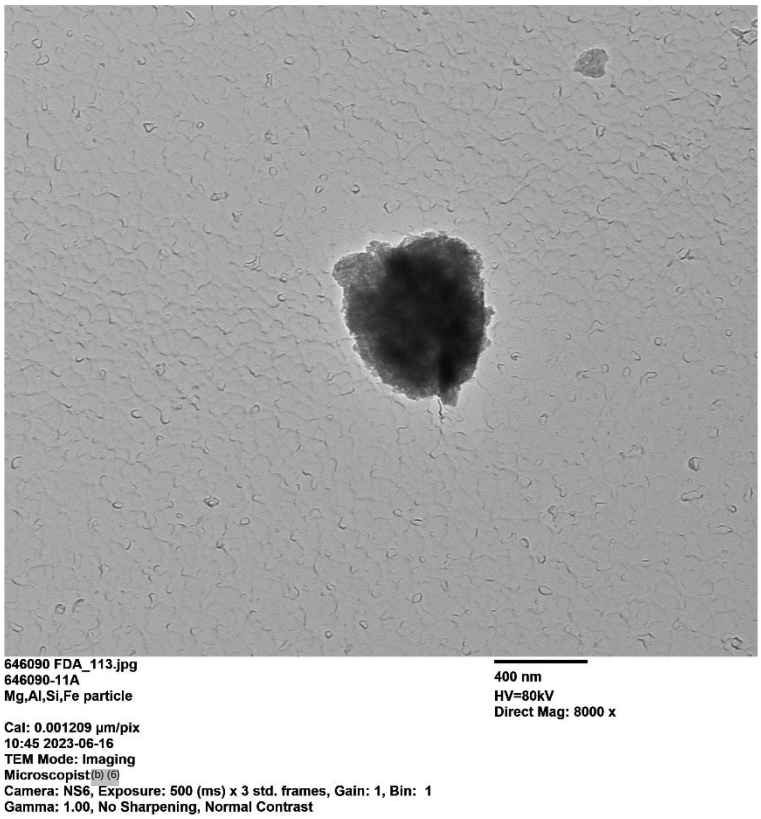
Cal: 0.003183 µm/pix
11:20 2023-06-16
TEM Mode: Diffraction
Microscopist (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

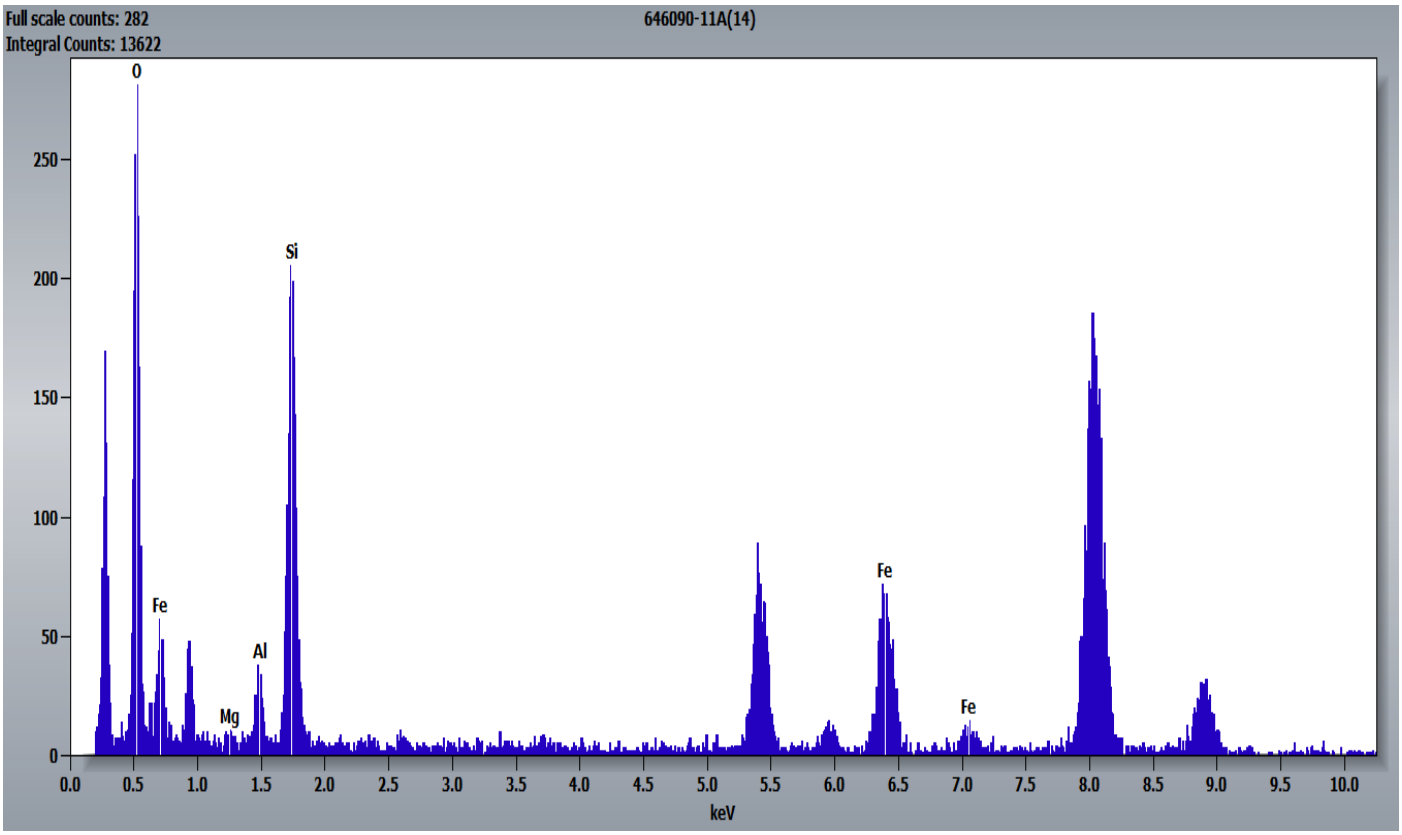
Chemistry from the Elongated Talc Particle Pictured Above



646090-11A, Particle Containing Magnesium, Aluminum, Silicon, and Iron



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



646090-12A, 12B, 12C/Client Sample: 04032023-12

PLM

All three aliquots of sample 04032023-12 were analyzed by (b) (6) on June 9, 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.

646090-12A	No Asbestos Detected
646090-12B	No Asbestos Detected
646090-12C	No Asbestos Detected

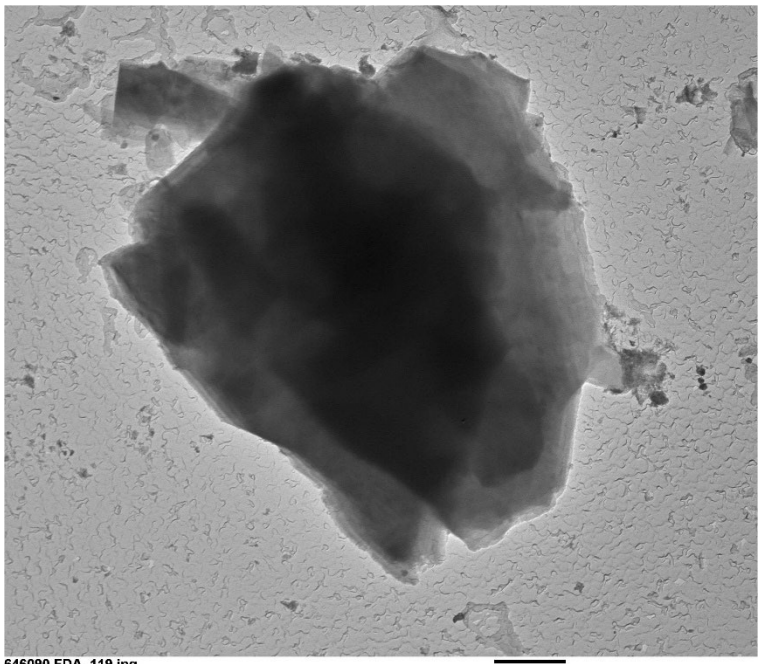
TEM

(b) (6) analyzed aliquot 12A on June 16, 2023. (b) (6) analyzed aliquots 12B and 12C on June 19, 2023, and (b) (6) analyzed aliquot 11C on June 19, 2023. The primary particle observed was talc; calcium particles, silica spheres, and elongated titanium were also observed along with mica particles, talc ribbons/fibers, and particles containing magnesium, aluminum, silicon, and iron. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

646090-12A	No Asbestos Detected
646090-12B	No Asbestos Detected
646090-12C	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.

646090-12A, Talc Particle

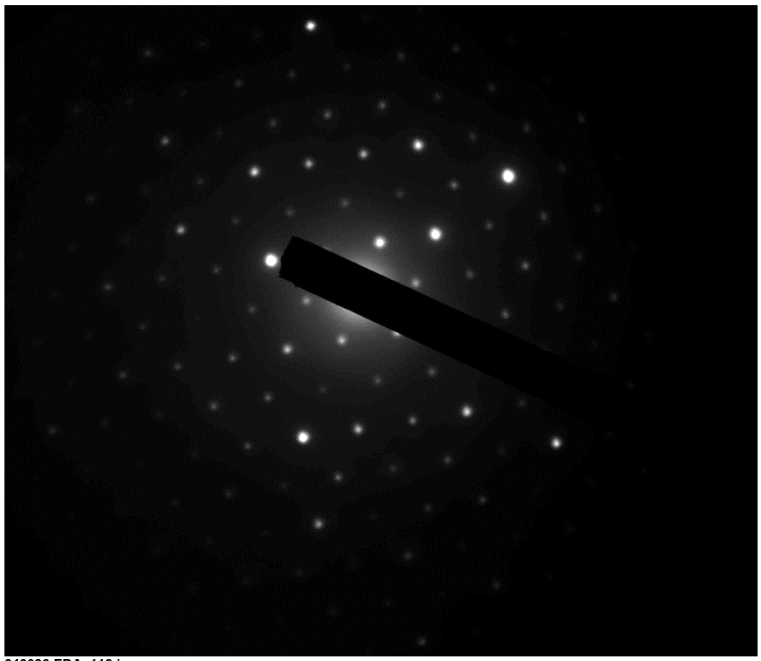


646090 FDA_119.jpg
646090-12a
Talc

Cal: 0.002387 µm/pix
11:59 2023-06-16
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: 4000 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

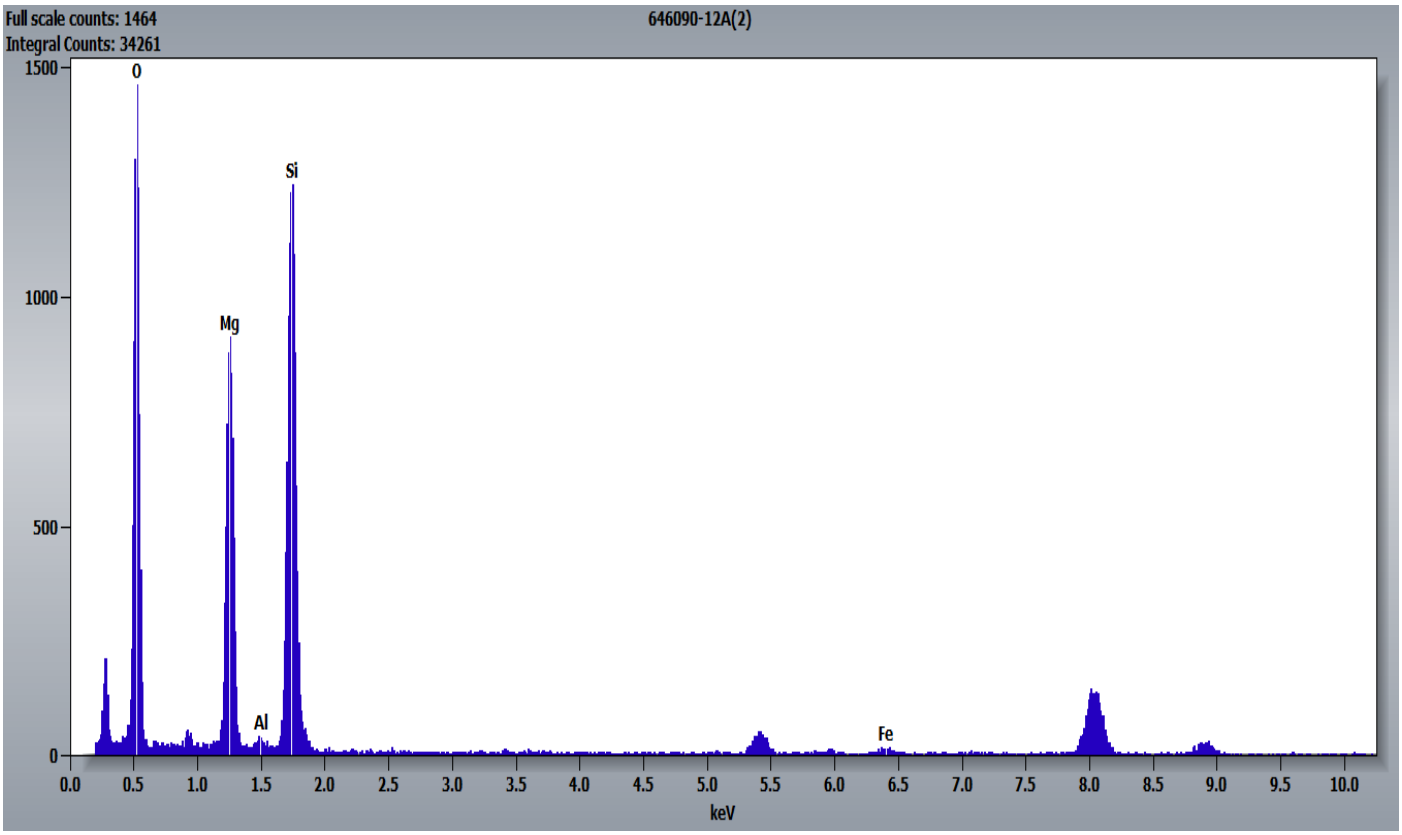


646090 FDA_118.jpg
646090-12a
Talc

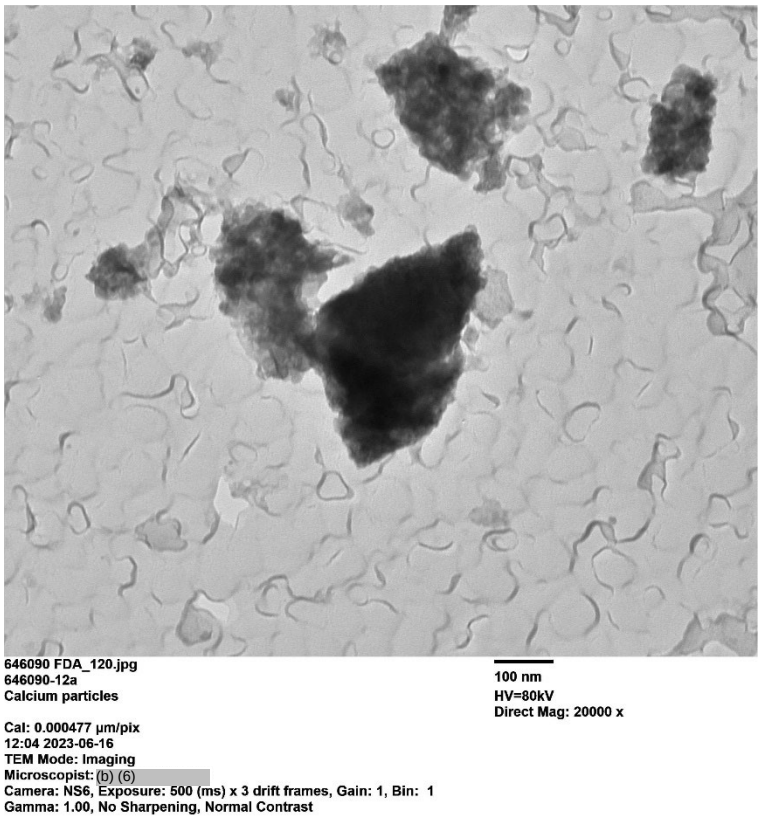
11:55 2023-06-16
TEM Mode: Diffraction
Microscopist: (b) (6) r
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

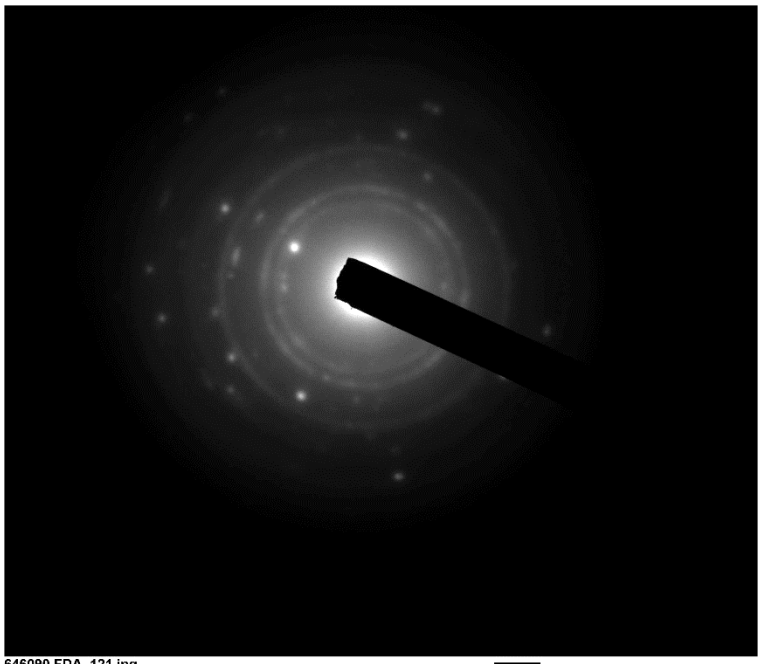
Chemistry from the Talc Particle Pictured Above



646090-12A, Calcium Particles



Diffraction Pattern from the Calcium Particles Pictured Above

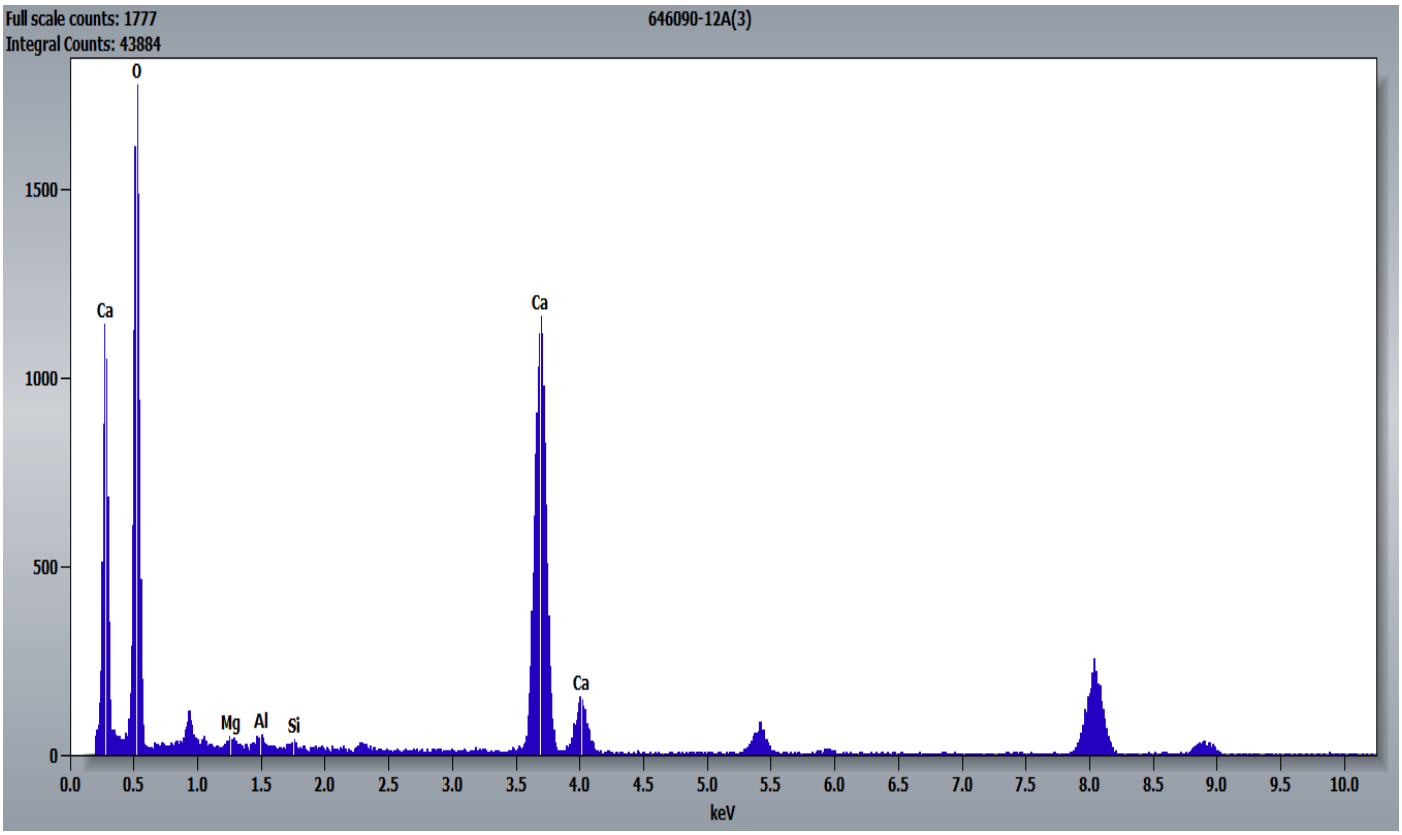


646090 FDA_121.jpg
646090-12a
Calcium particles

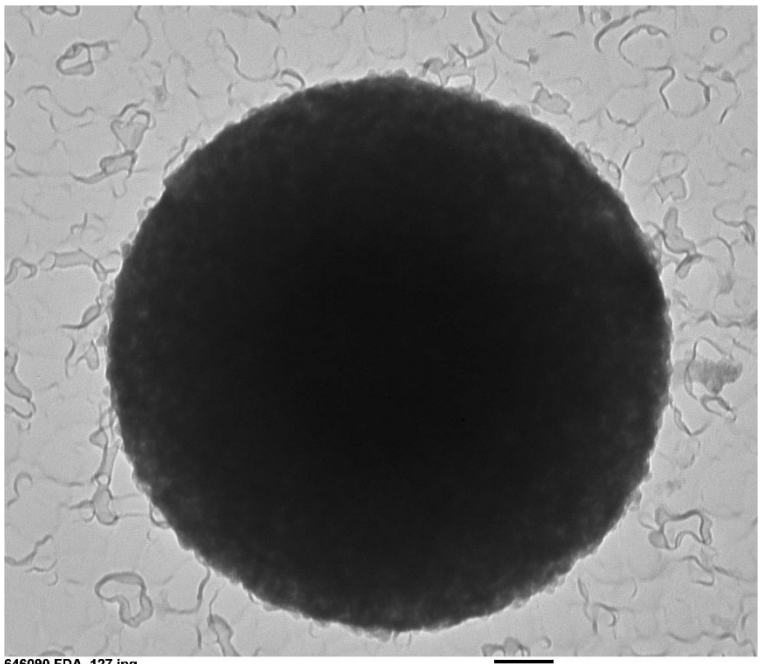
Cal: 0.000477 µm/pix
12:05 2023-06-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 Å⁻¹
HV=80kV
Cam Len: 0.2000 m

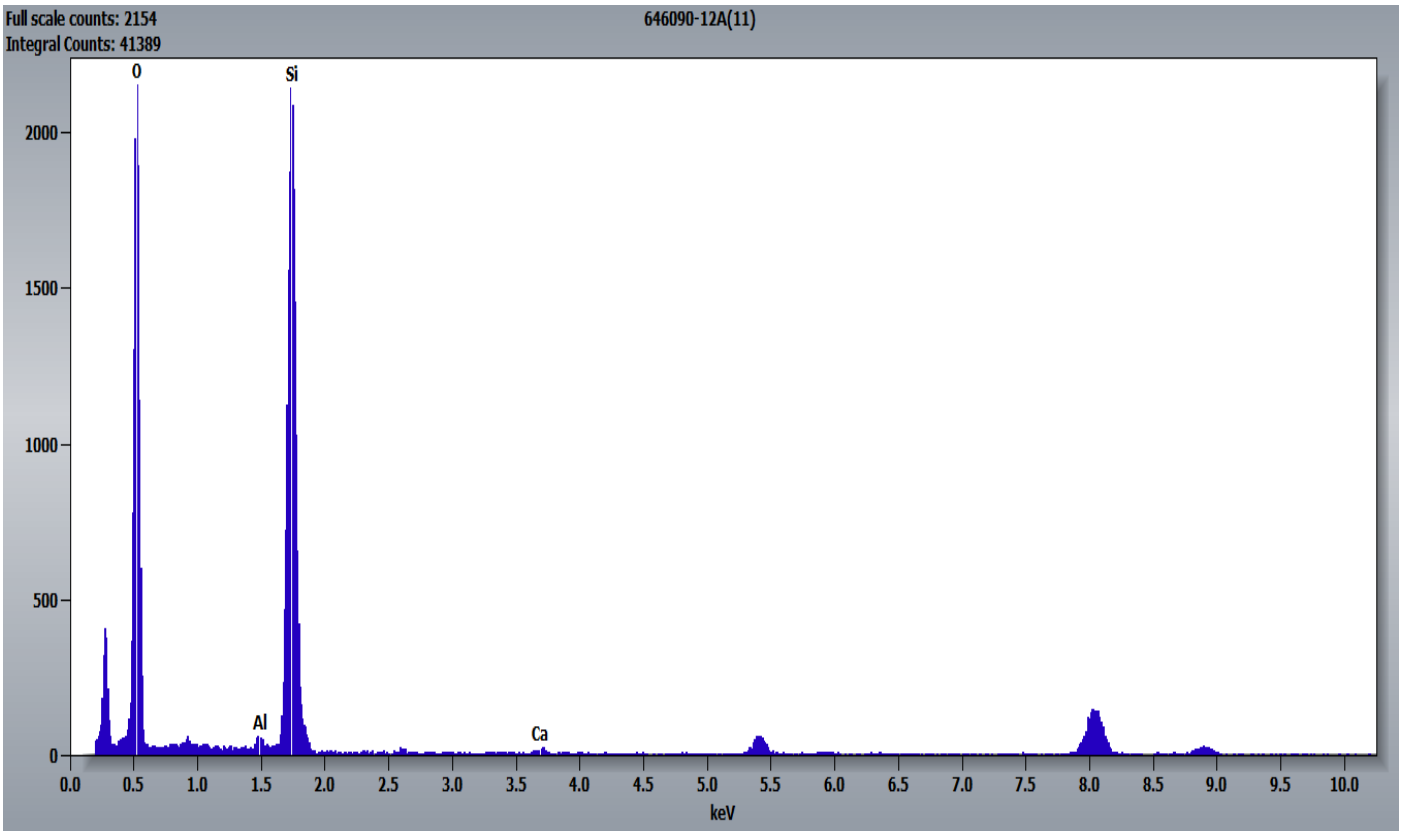
Chemistry from the Calcium Particles Pictured Above



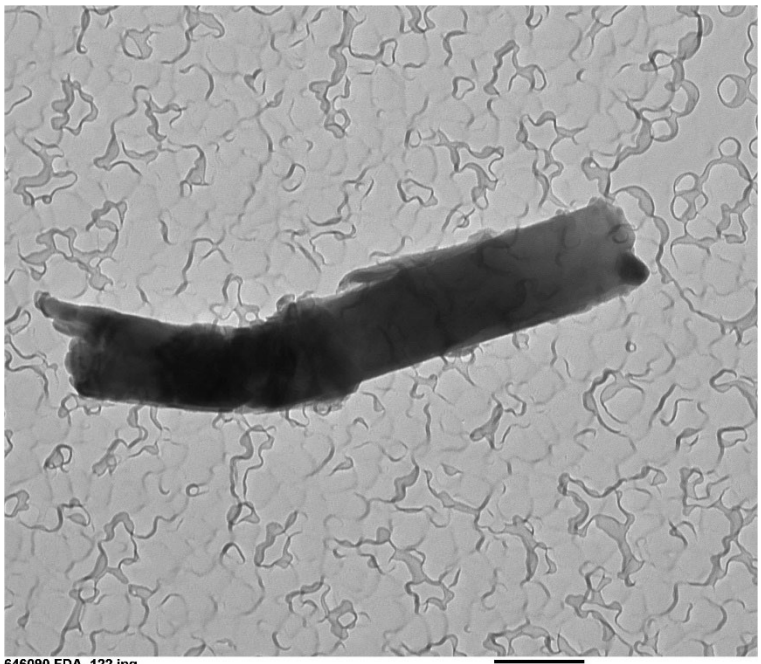
646090-12A, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



646090-12A, Elongated Titanium Particle

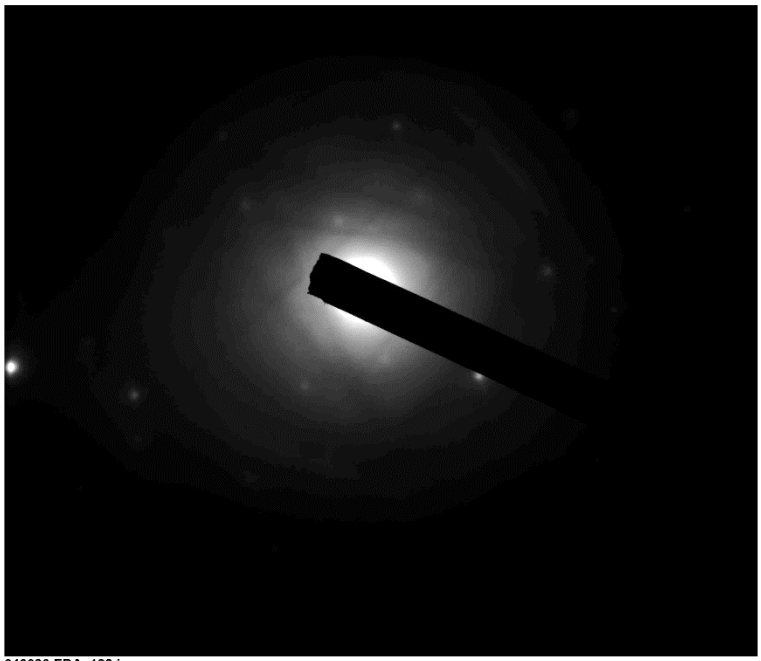


646090 FDA_122.jpg
646090-12a
Ti fiber

Cal: 0.000626 µm/pix
12:17 2023-06-16
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 Elongated Titanium Particle Pictured Above

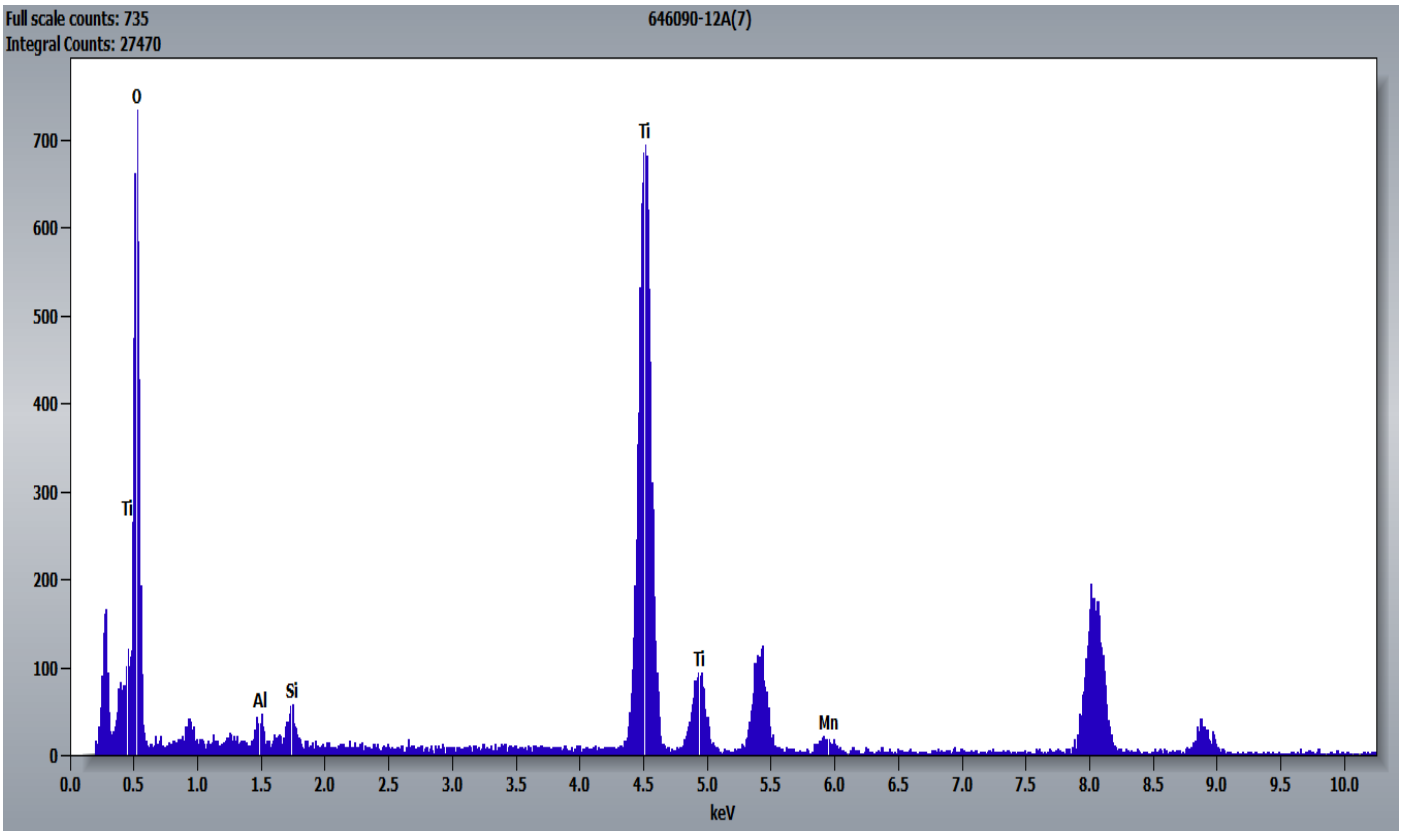


646090 FDA_123.jpg
646090-12a
Ti fiber

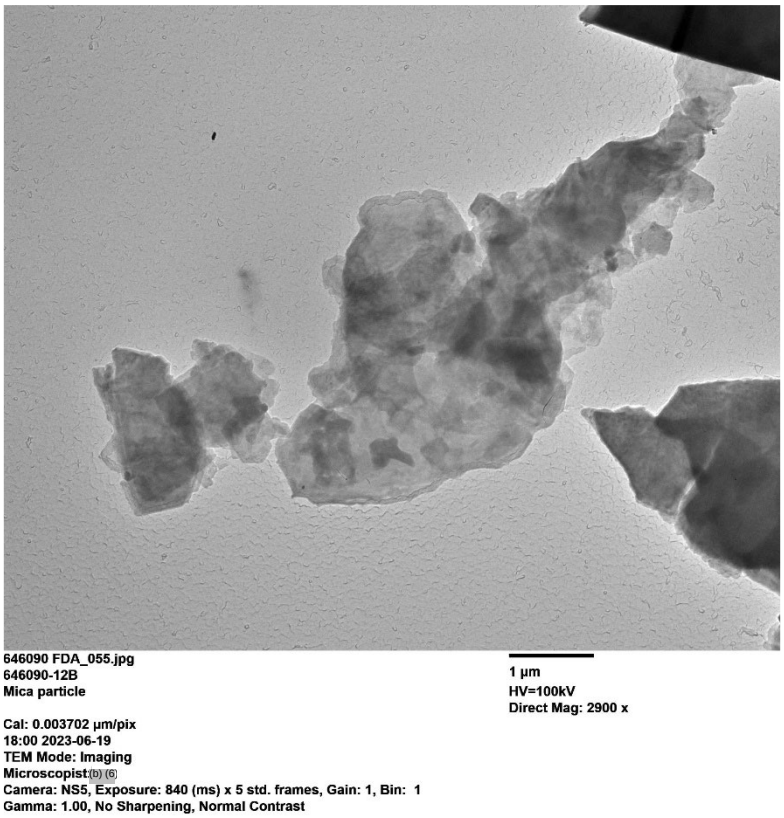
Cal: 0.000626 µm/pix
12:19 2023-06-16
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Elongated Titanium Particle Pictured Above

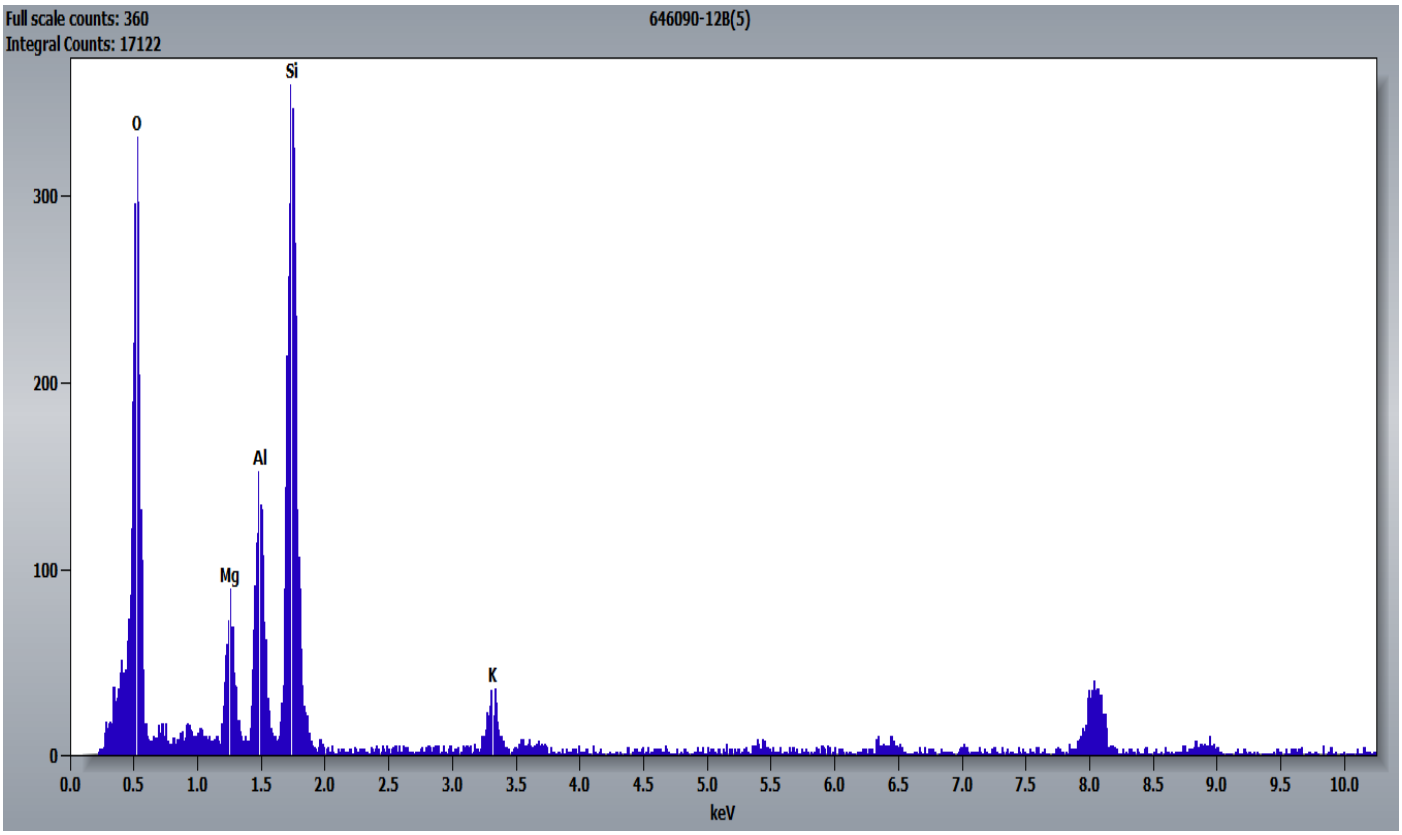


646090-12B, Mica Particle

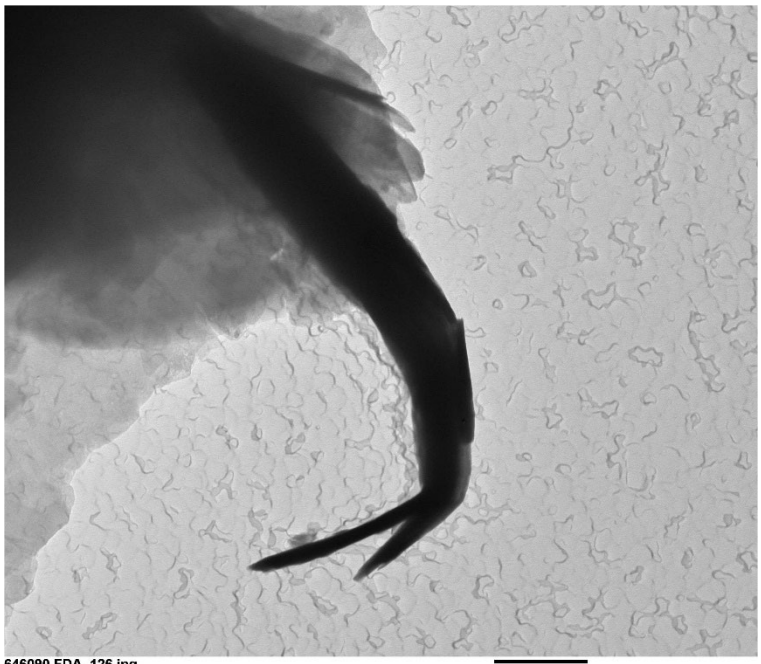


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

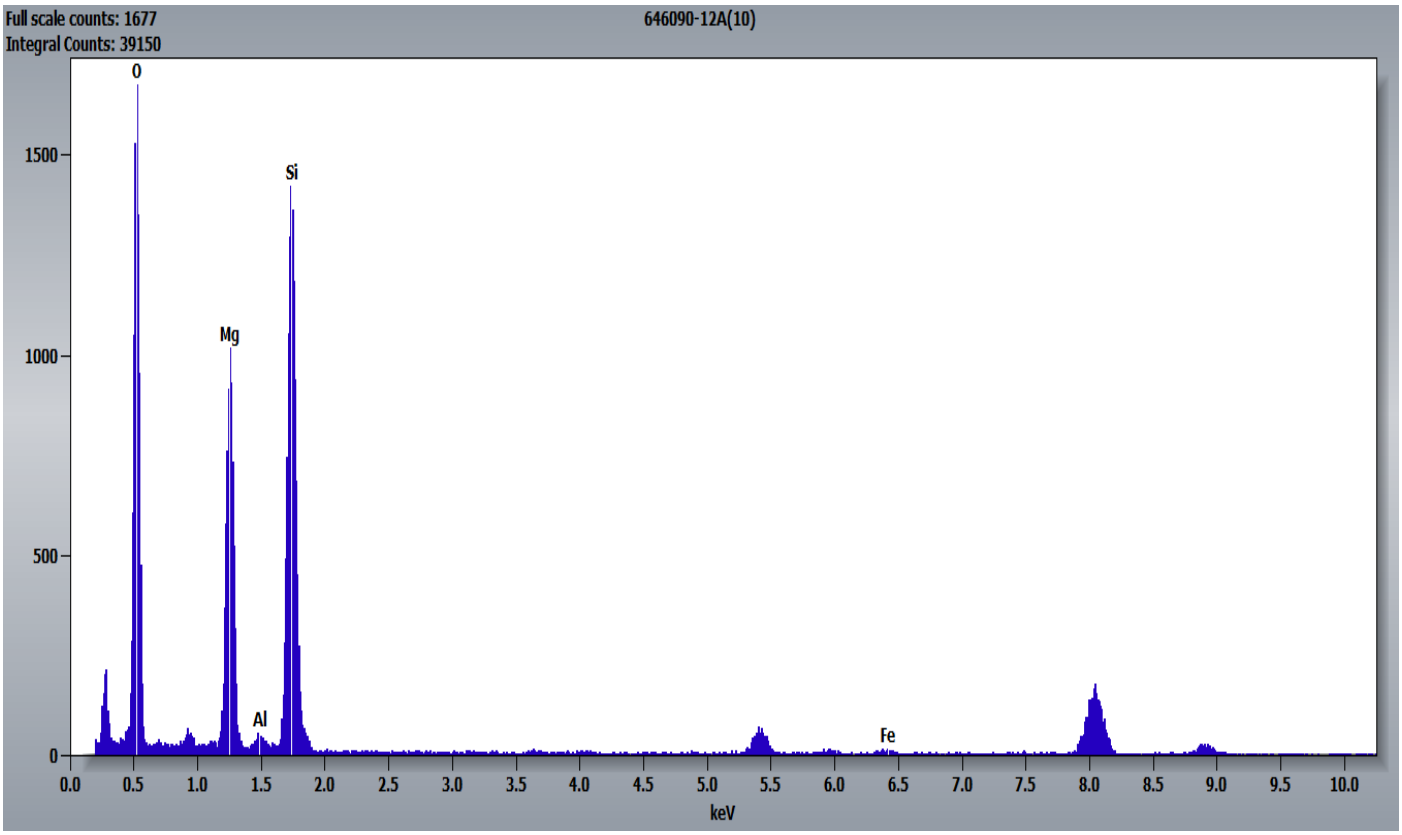
Chemistry from the Mica Particle Pictured Above



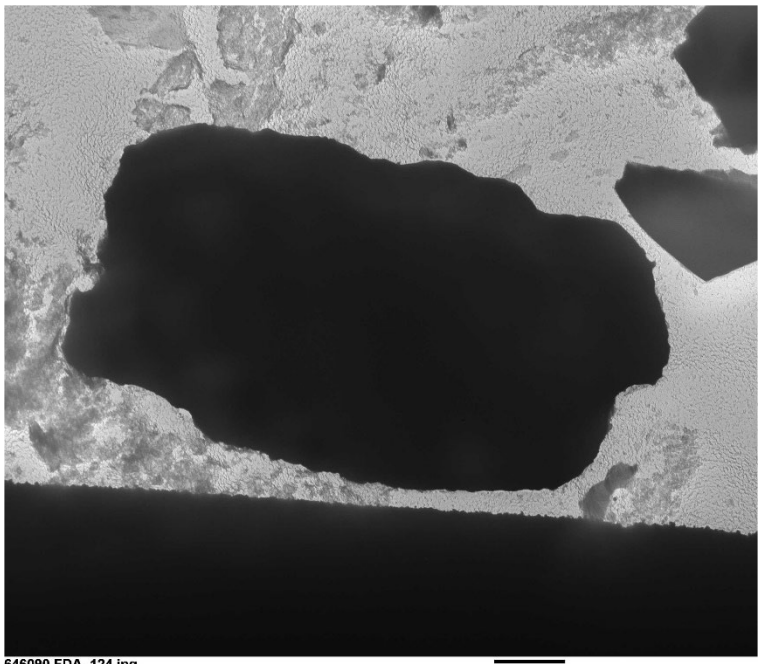
646090-12A, Talc Ribbon



Chemistry from the Talc Ribbon Pictured Above



646090-12A, Particle Containing Magnesium, Aluminum, Silicon, and Iron

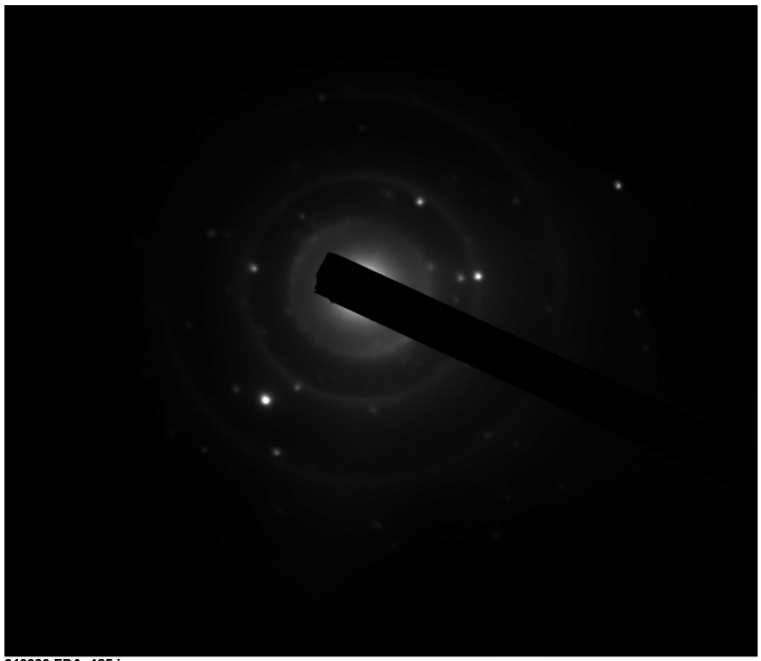


646090 FDA_124.jpg
646090-12a
O,Mg,Al,Si,Fe particle

Cal: 0.007956 µm/pix
12:31 2023-06-16
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

2 µm
HV=80kV
Direct Mag: 1200 x

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

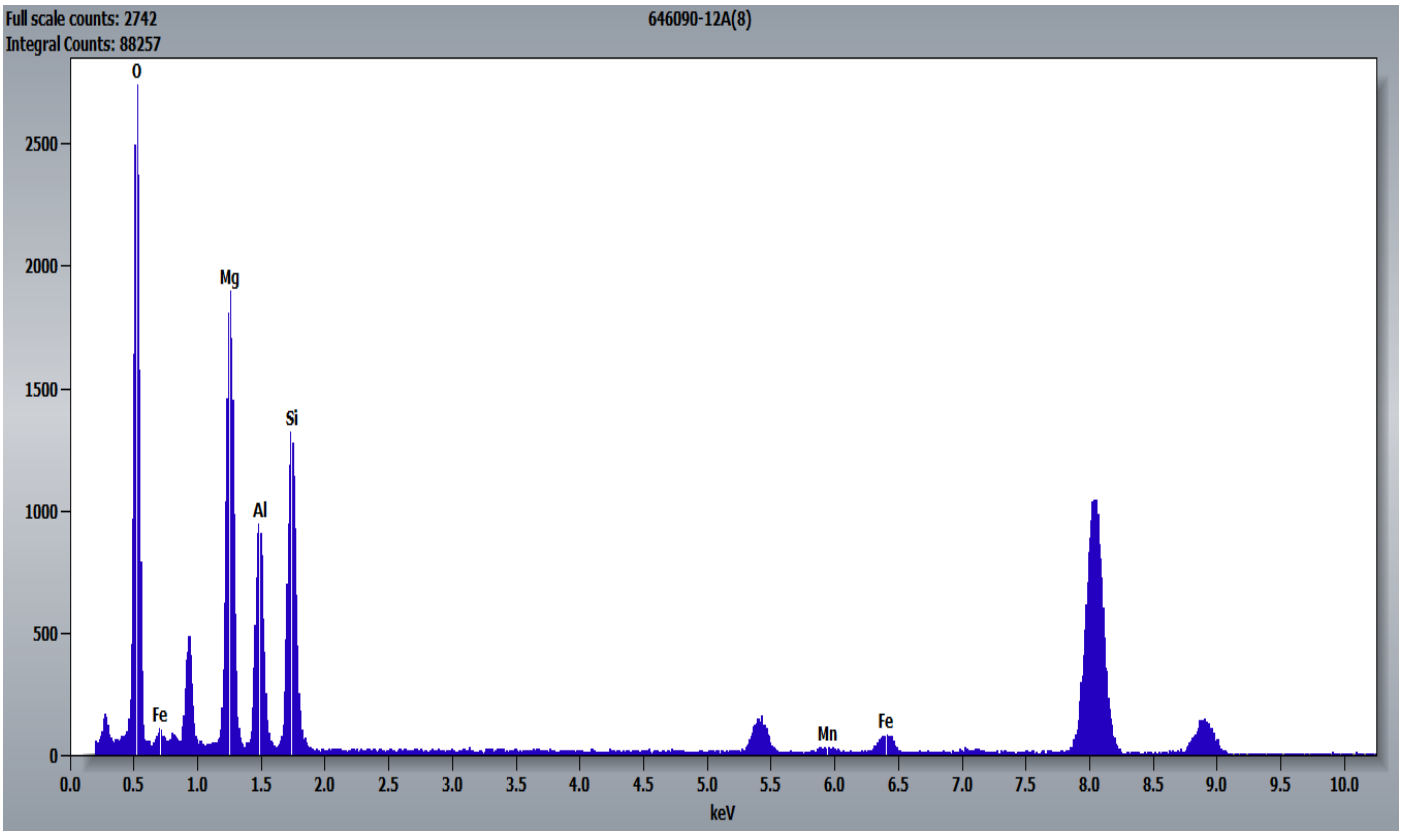


646090 FDA_125.jpg
646090-12a
O,Mg,Al,Si,Fe particle

Cal: 0.007956 µm/pix
12:33 2023-06-16
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 Particle Containing Magnesium, Aluminum, Silicon, and Iron Pictured Above



646090-13A, 13B, 13C/Client Sample: 04032023-13

PLM

All three aliquots of sample 04032023-13 were analyzed by (b) (6) on June 20, 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.

646090-13A	No Asbestos Detected
646090-13B	No Asbestos Detected
646090-13C	No Asbestos Detected

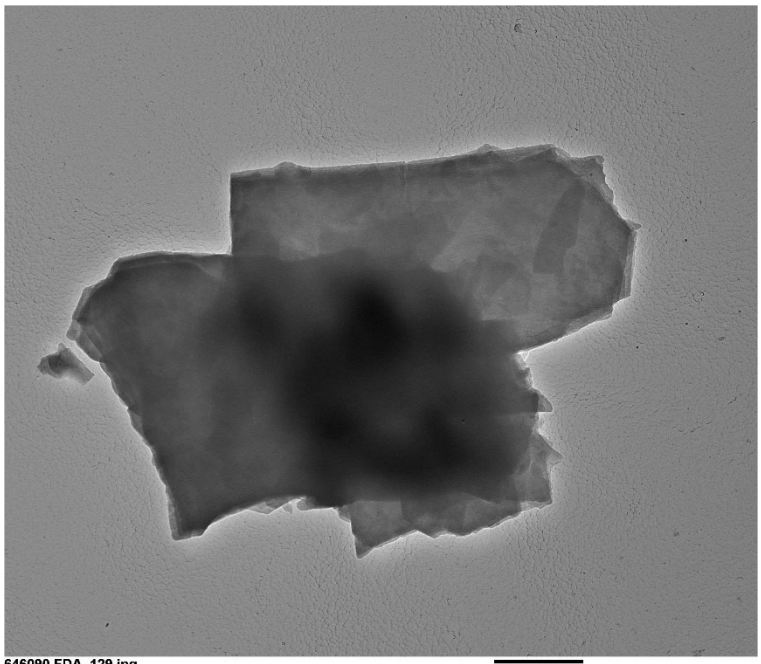
TEM

(b) (6) analyzed aliquot 13A on June 21, 2023. (b) (6) analyzed aliquot 13B on June 22, 2023, and (b) (6) analyzed aliquot 13C on June 22, 2023. The primary particle observed was talc; calcium particles 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.

646090-13A	No Asbestos Detected
646090-13B	No Asbestos Detected
646090-13C	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.

646090-13A, Talc Particle

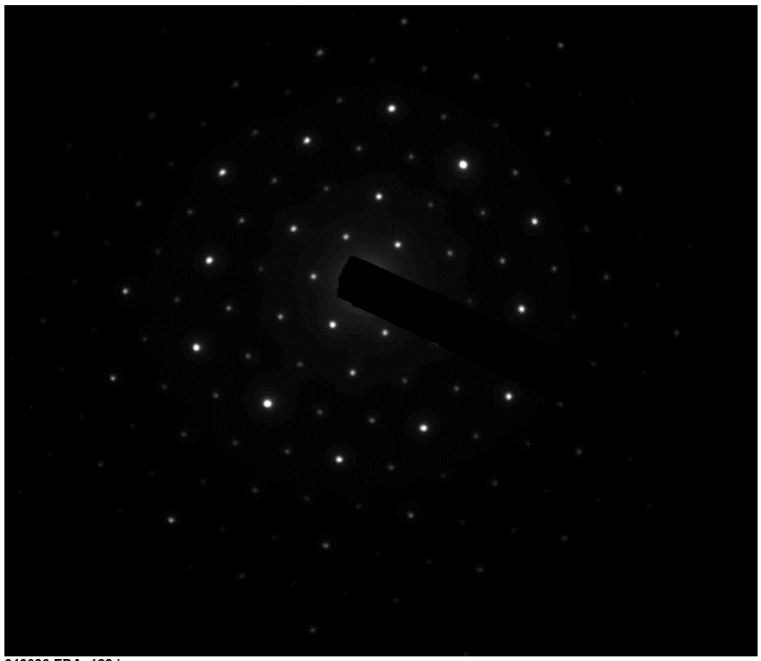


646090 FDA_129.jpg
646090-13a
Talc

Cal: 0.003183 µm/pix
09:54 2023-06-21
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

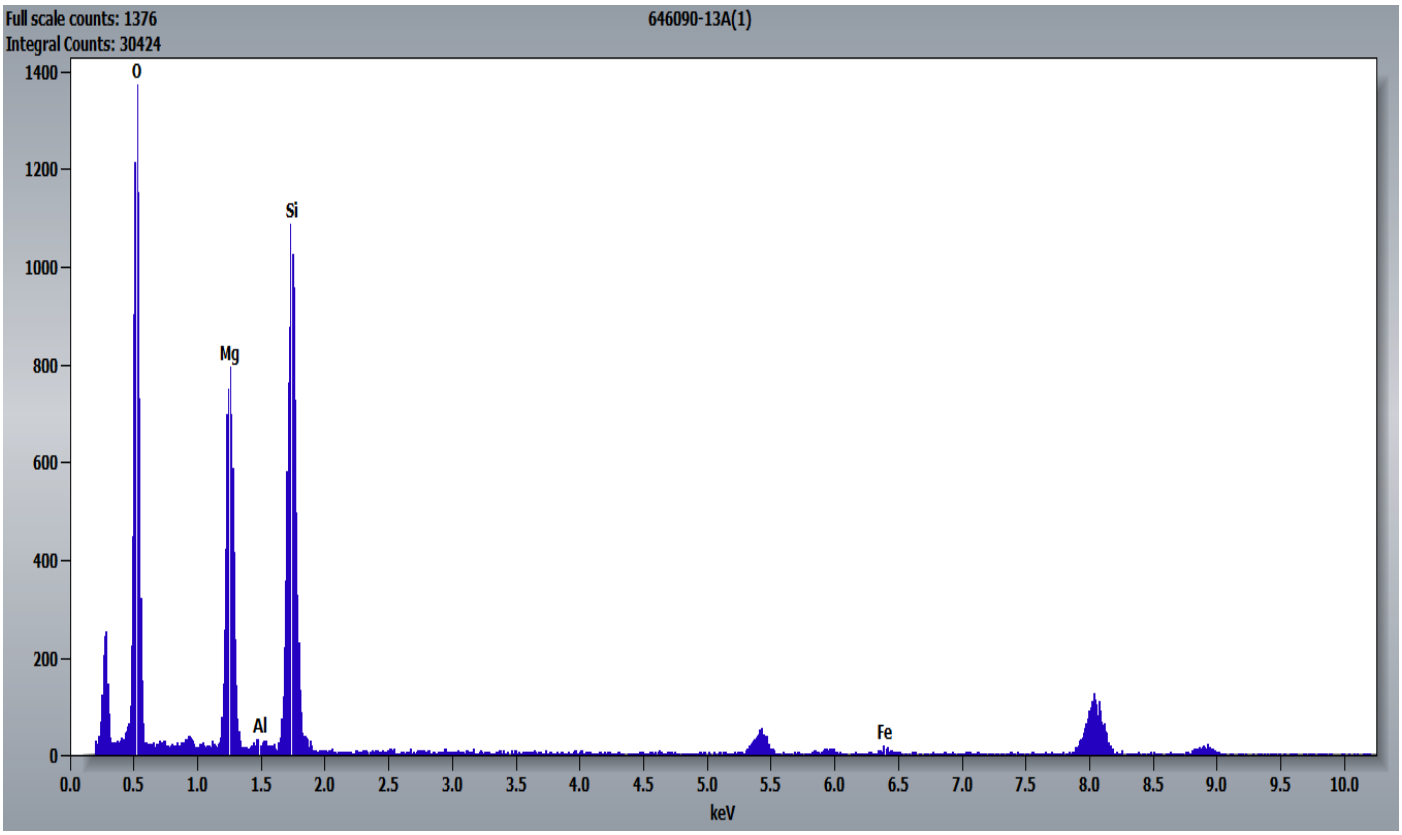


646090 FDA_128.jpg
646090-13a
Talc

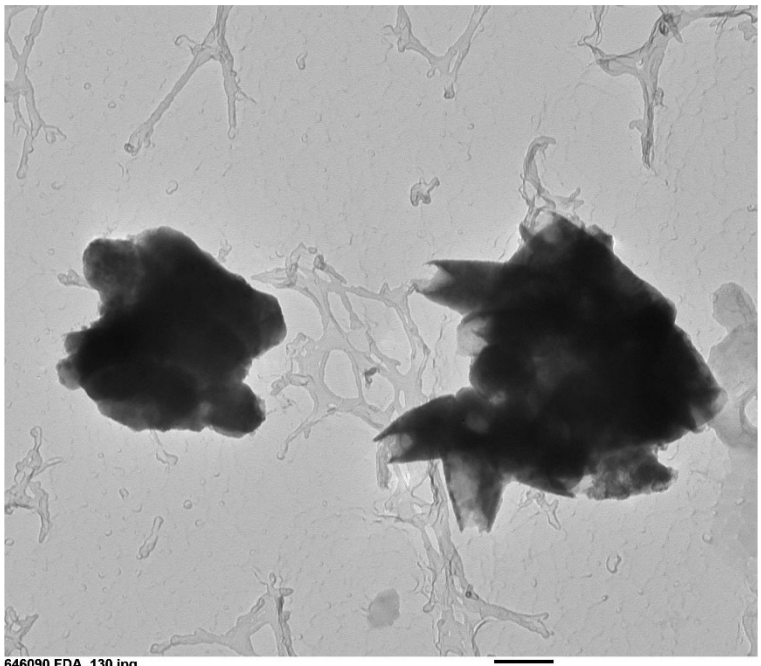
09:50 2023-06-21
TEM Mode: Diffraction
Microscopist: (b) (6)
Camera: NS6, Exposure: 500 (ms) x 3 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

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

Chemistry from the Talc Particle Pictured Above



646090-13A, Calcium Particles



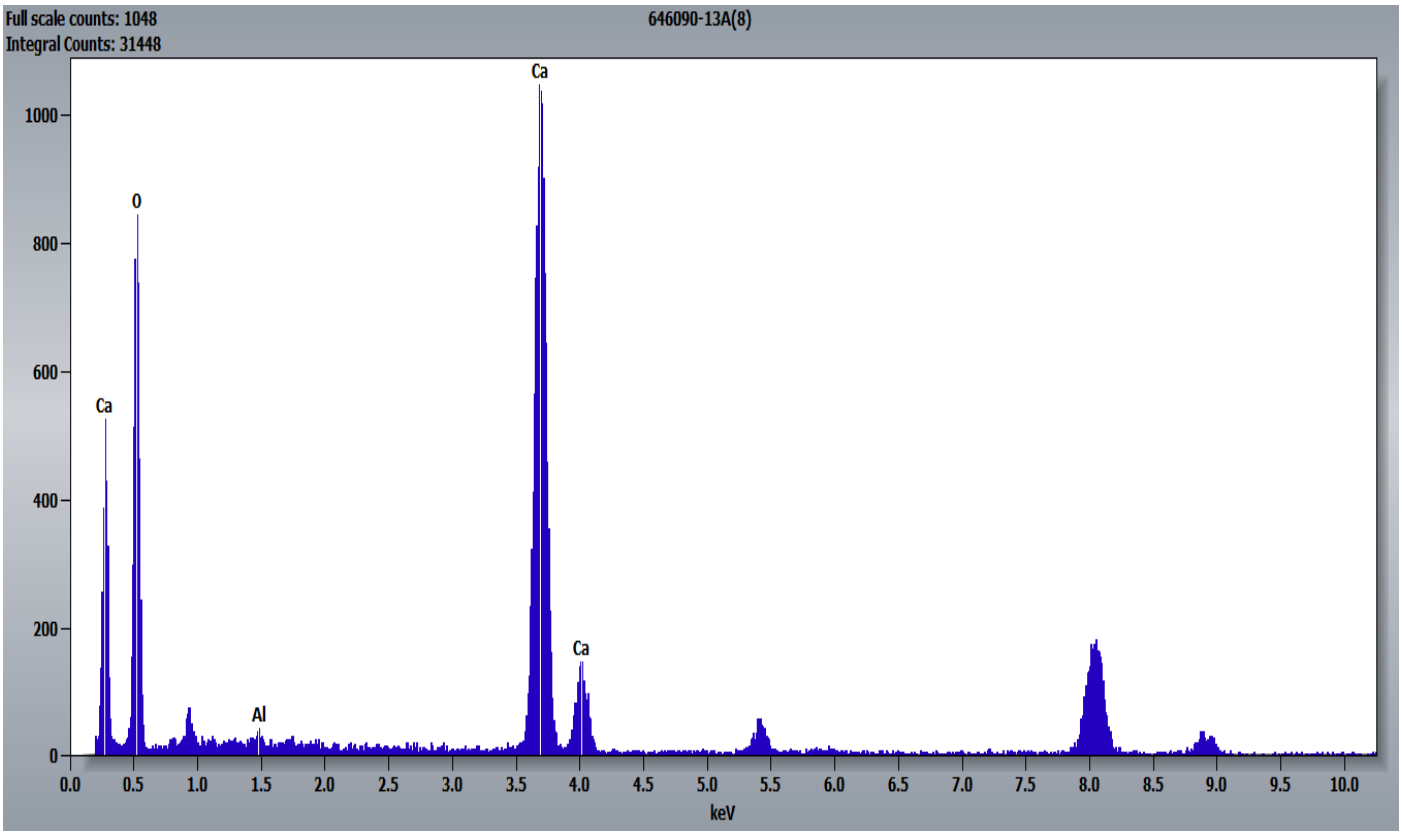
Diffraction Pattern from the Calcium Particles Pictured Above

646090 FDA_131.jpg
646090-13a
Calcium particles

Cal: 0.000955 µm/pix
10:21 2023-06-21
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 Calcium Particles Pictured Above



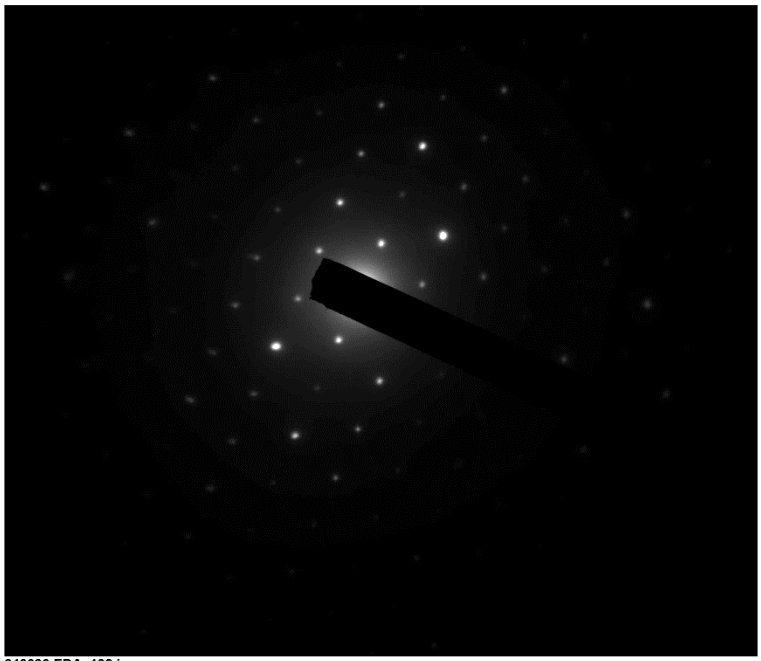
646090-13A, Elongated Talc Particle

646090 FDA_133.jpg
646090-13a
Talc Fiber

Cal: 0.002387 µm/pix
10:43 2023-06-21
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 Elongated Talc Particle Pictured Above

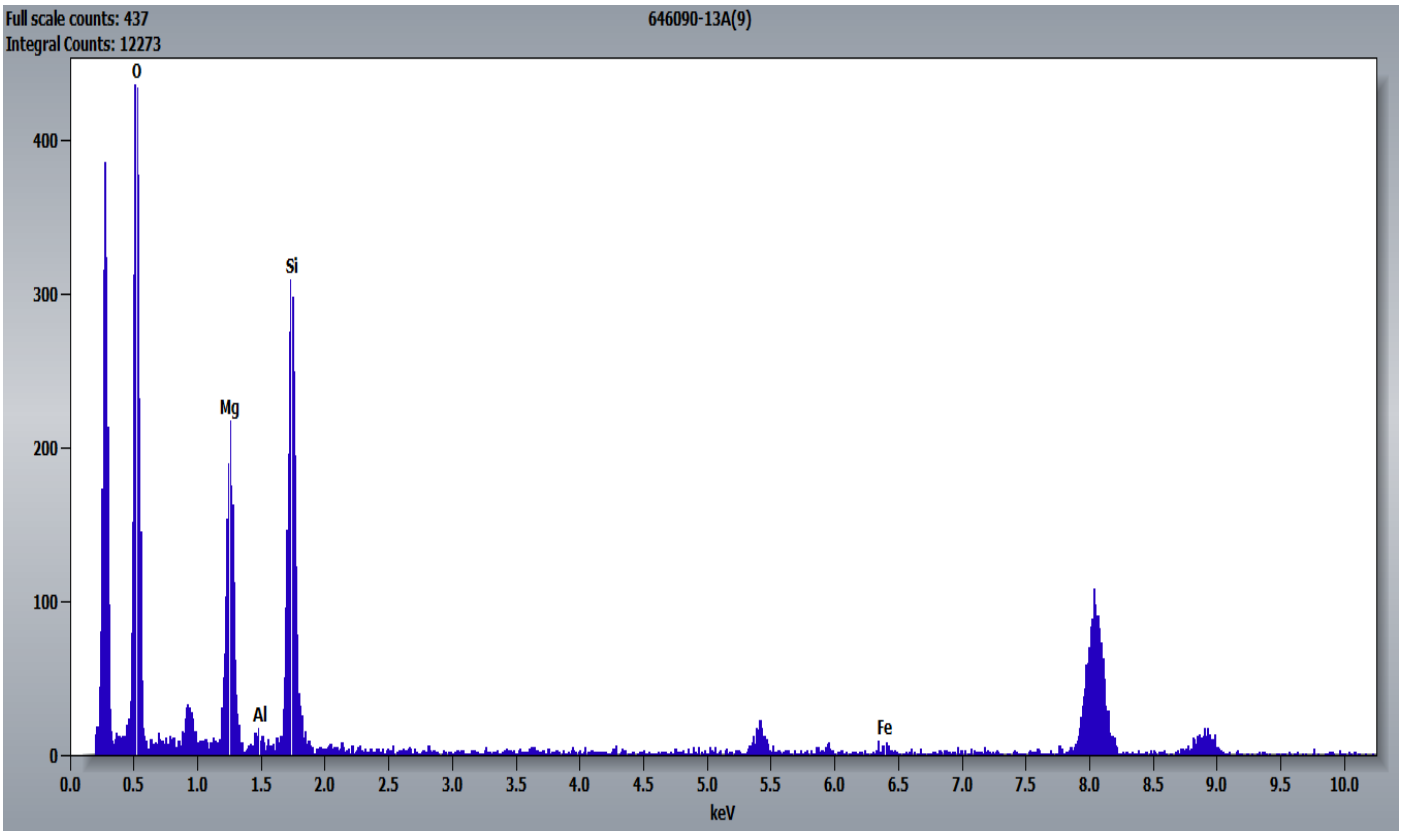


646090 FDA_132.jpg
646090-13a
Talc Fiber

Cal: 0.000955 µm/pix
10:40 2023-06-21
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



646090-14, 15, 16/04032023-14.1, 14.2, 14.3

PLM

Samples 04032023-14.1, 14.2, and 14.3 were analyzed by (b) (6) on June 20, 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.

646090-14	No Asbestos Detected
646090-15	No Asbestos Detected
646090-16	No Asbestos Detected

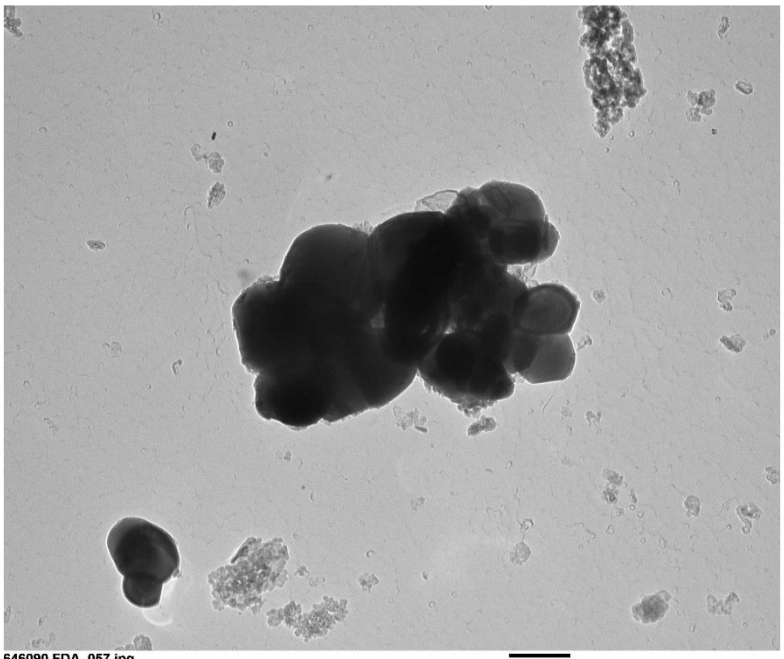
TEM

(b) (6) analyzed sample 14 on June 21, 2023. (b) (6) analyzed sample 15 on June 22, 2023, and (b) (6) analyzed sample 16 on June 22, 2023. The primary particles observed were titanium and particles containing chromium and iron; talc particles 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.

646090-14	No Asbestos Detected
646090-15	No Asbestos Detected
646090-16	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.

646090-14, Titanium Particles



646090 FDA_057.jpg
646090-14
Ti particles

Cal: 0.001030 µm/pix
12:13 2023-06-21
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=100kV
Direct Mag: 10000 x

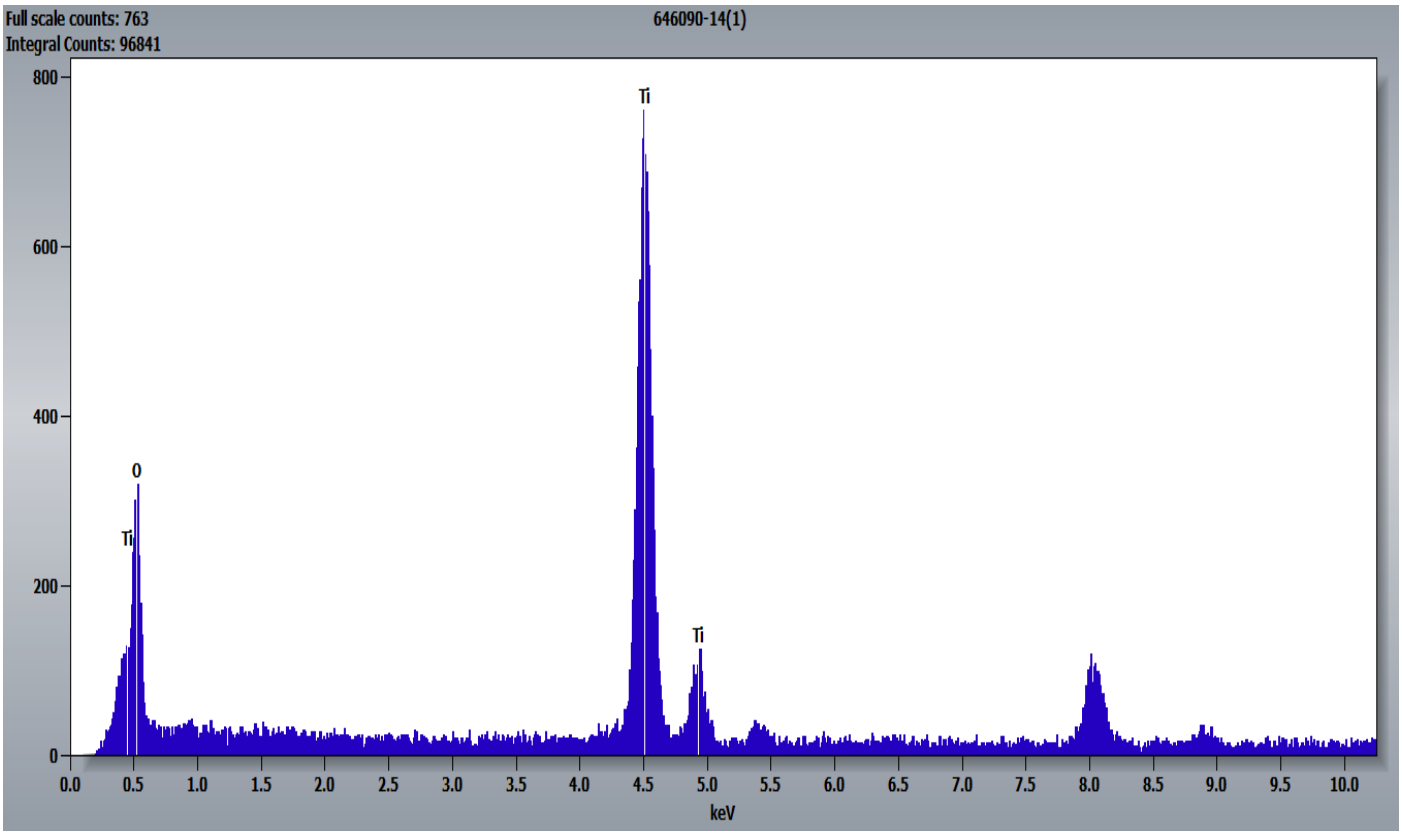
Diffraction Pattern from the Titanium Particles Pictured Above

646090 FDA_056.jpg
646090-14
Ti particles

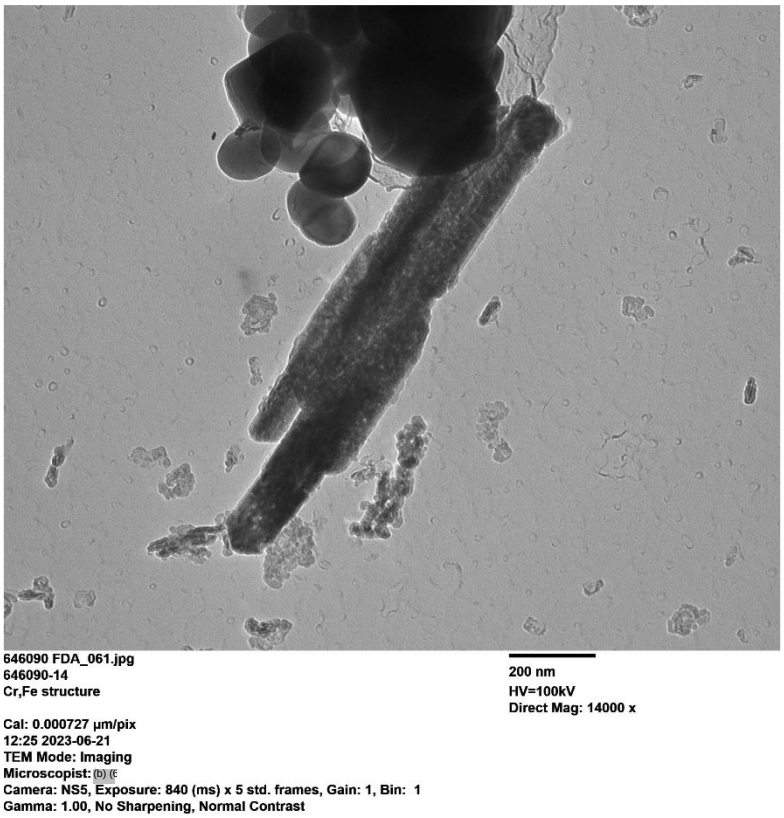
12:12 2023-06-21
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

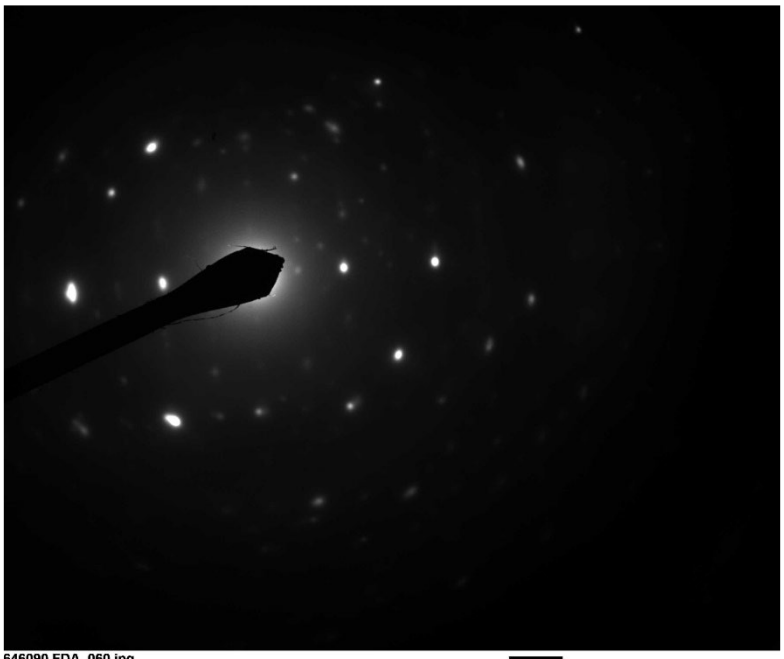
Chemistry from the Titanium Particles Pictured Above



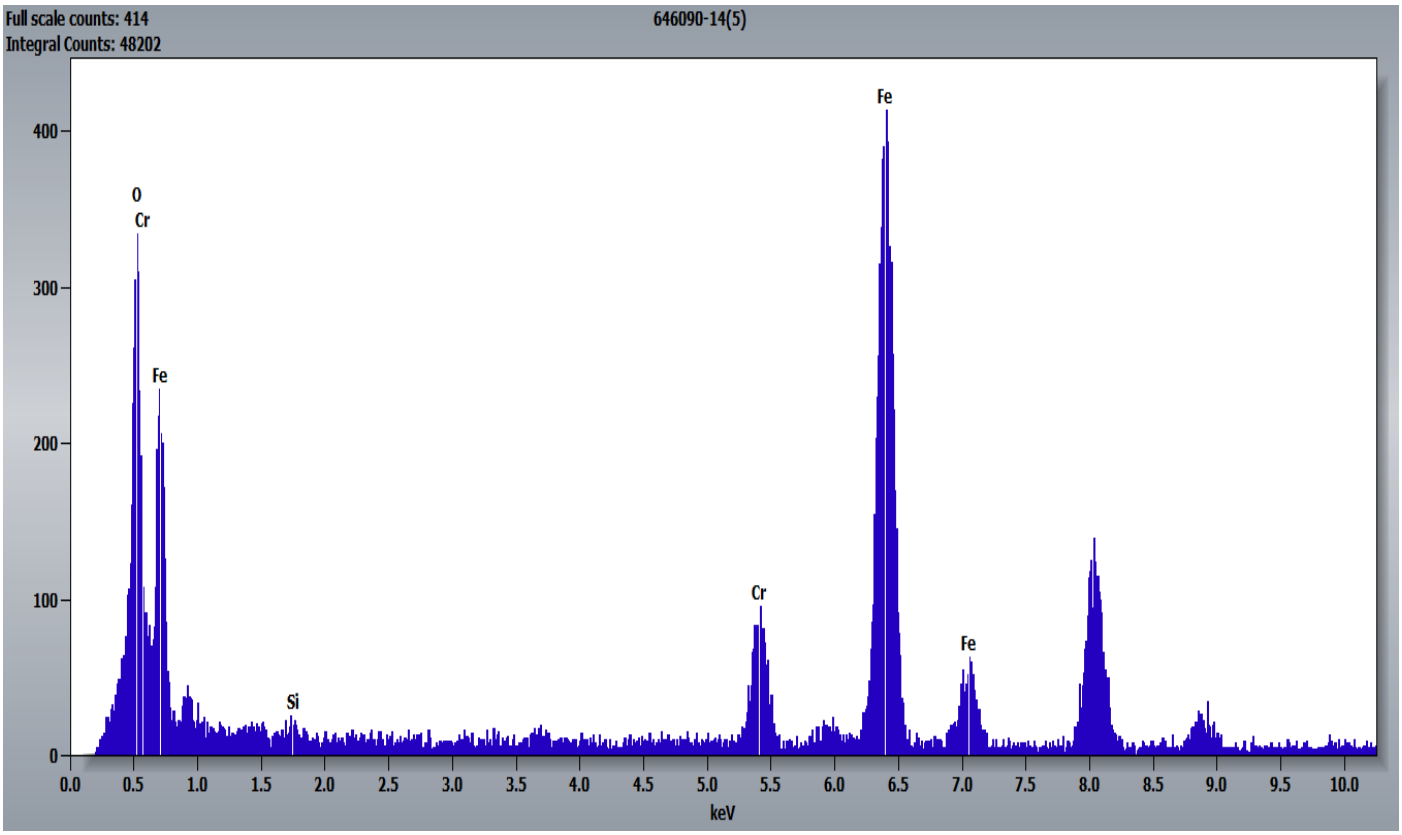
646090-14, Elongated Particle Containing Chromium and Iron



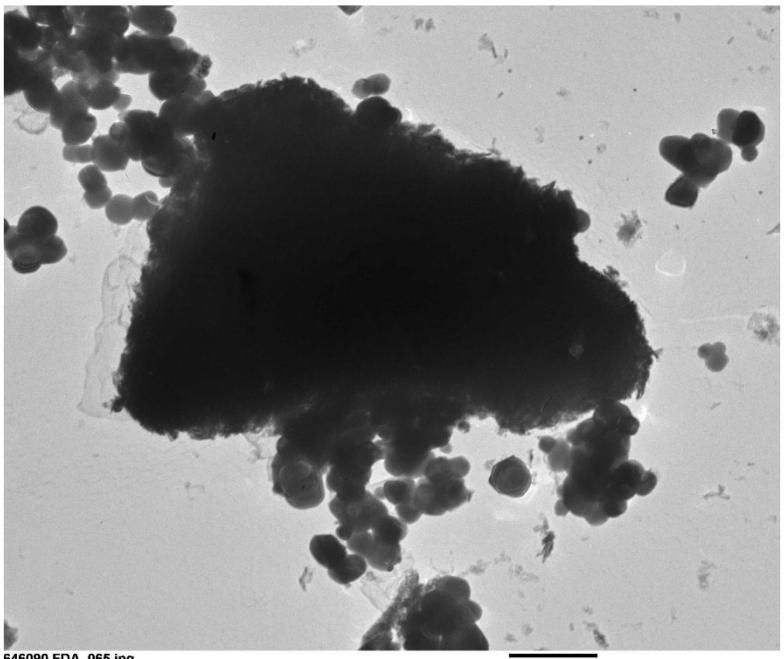
Diffraction Pattern from the Elongated Particle Containing Chromium and Iron Pictured Above



Chemistry from the Elongated Particle Containing Chromium and Iron Pictured Above



646090-14, Particle Containing Chromium and Iron



646090 FDA_065.jpg
646090-14
Cr,Fe particle

Cal: 0.002145 µm/pix
12:54 2023-06-21
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=100kV
Direct Mag: 4800 x

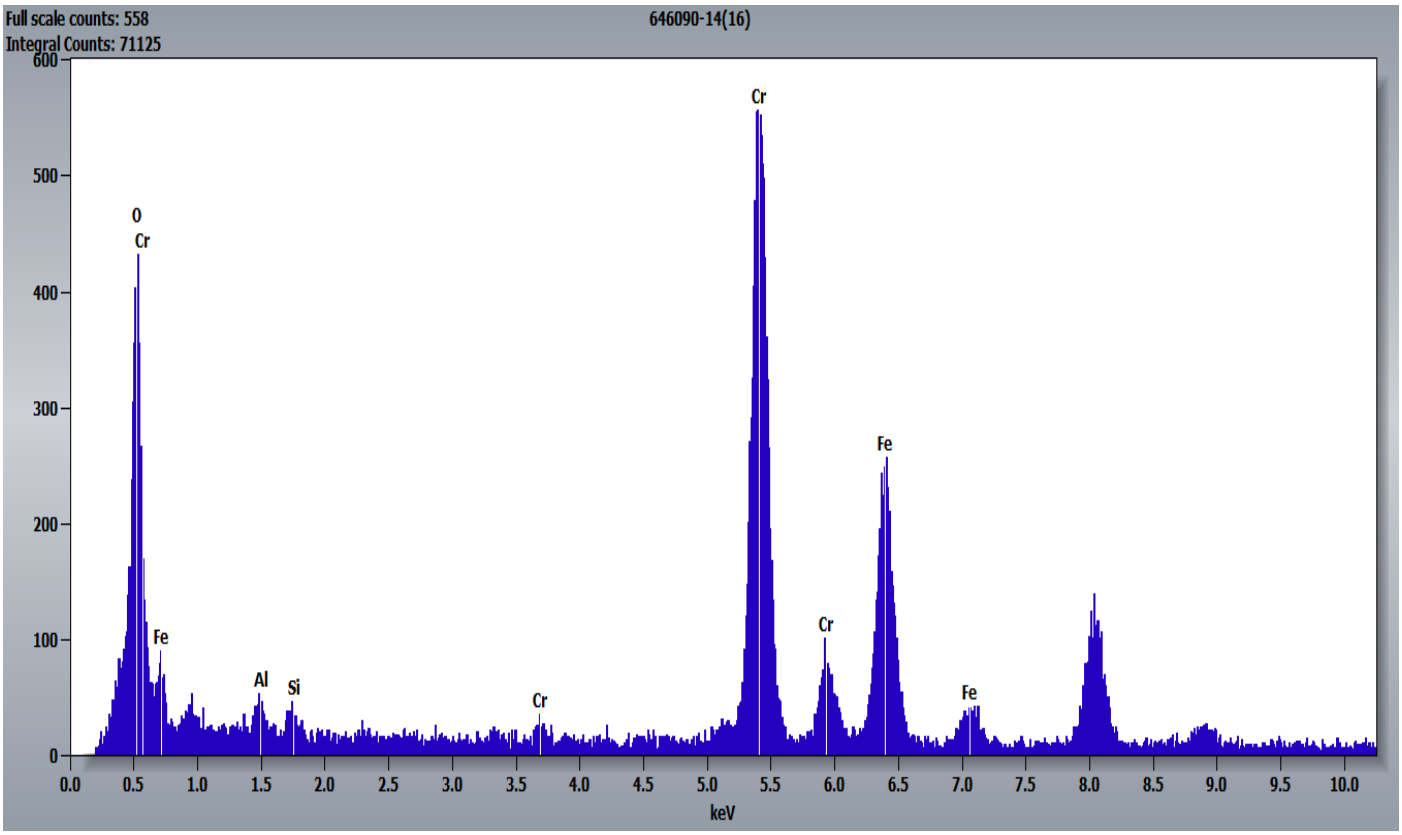
Diffraction Pattern from the Particle Containing Chromium and Iron Pictured Above

646090 FDA_064.jpg
646090-14
Cr,Fe particle

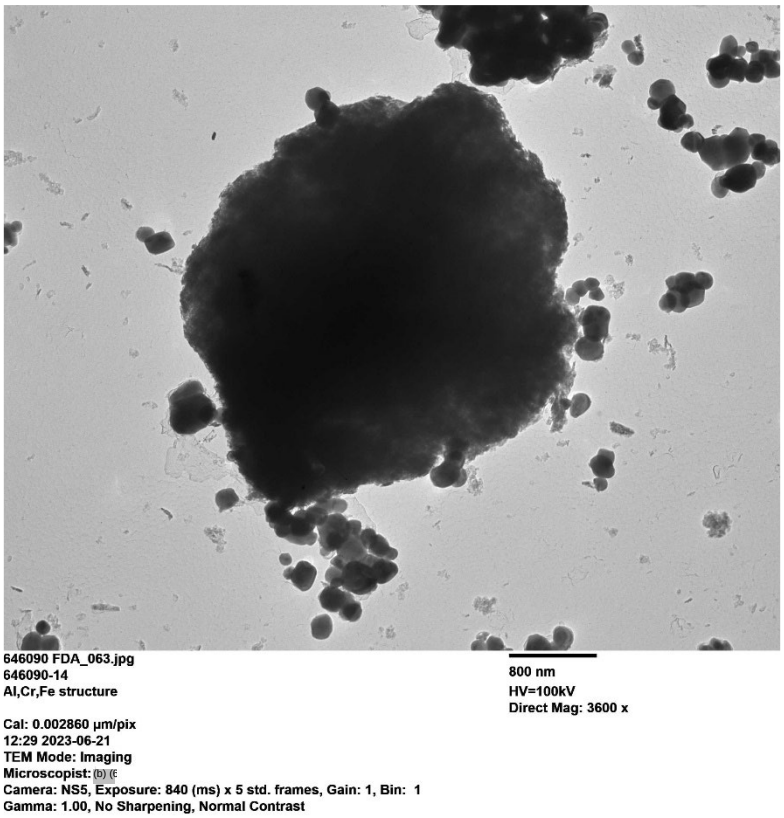
Cal: 0.002860 µm/pix
12:53 2023-06-21
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Particle Containing Chromium and Iron Pictured Above

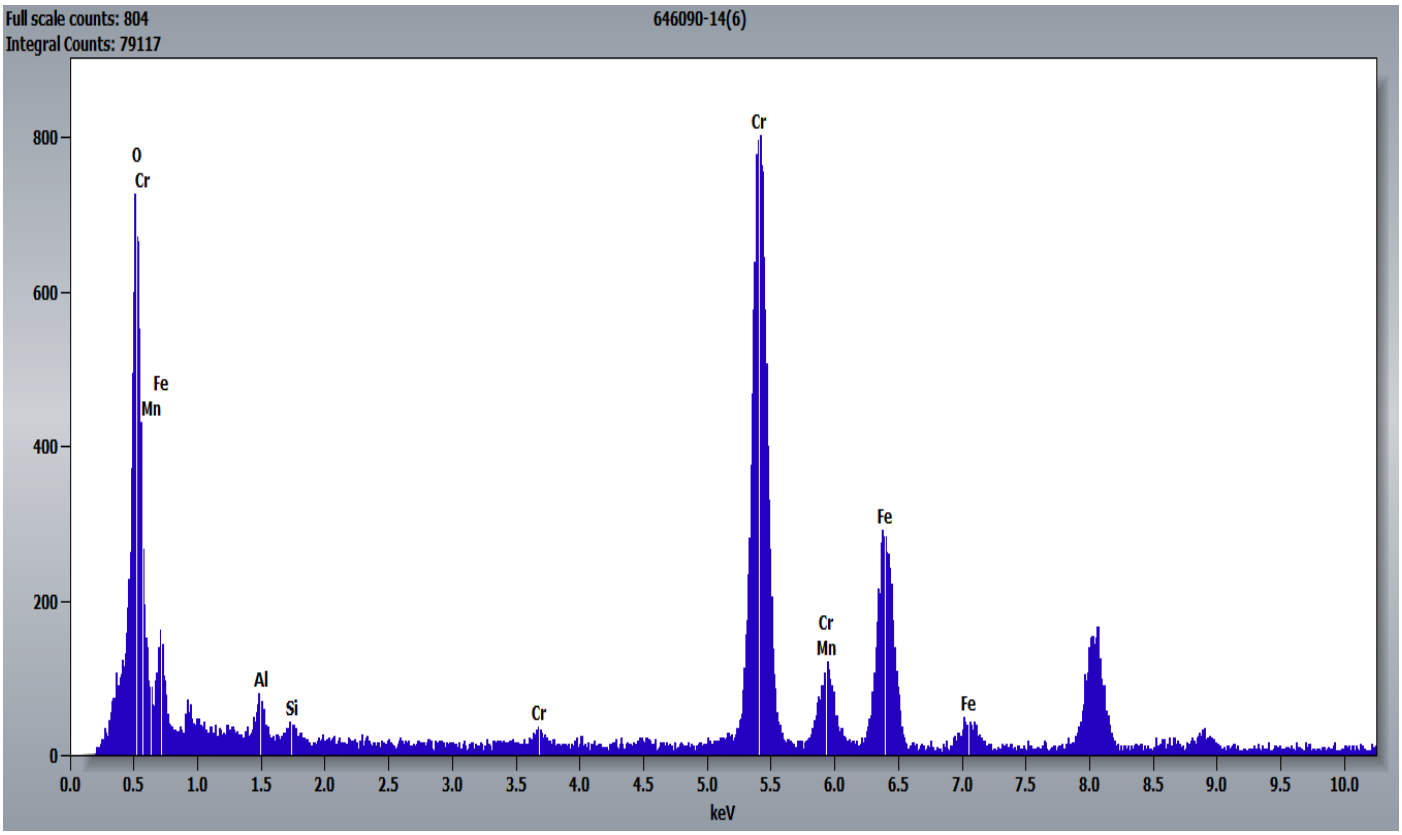


46090-14, Particle Containing Aluminum, Chromium, and Iron

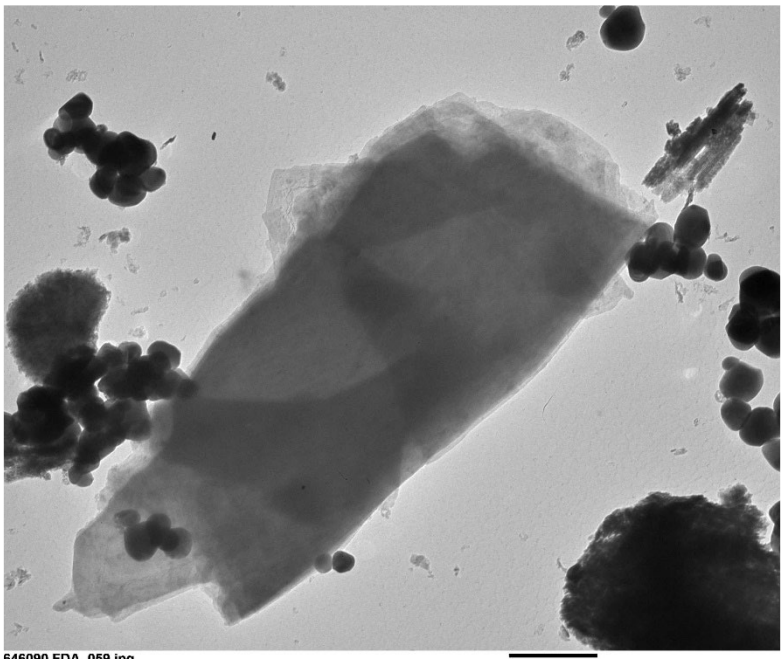


Diffraction Pattern from the Particle Containing Aluminum, Chromium, and Iron Pictured Above

Chemistry from the Particle Containing Aluminum, Chromium, and Iron Pictured Above



646090-14, Talc Particle

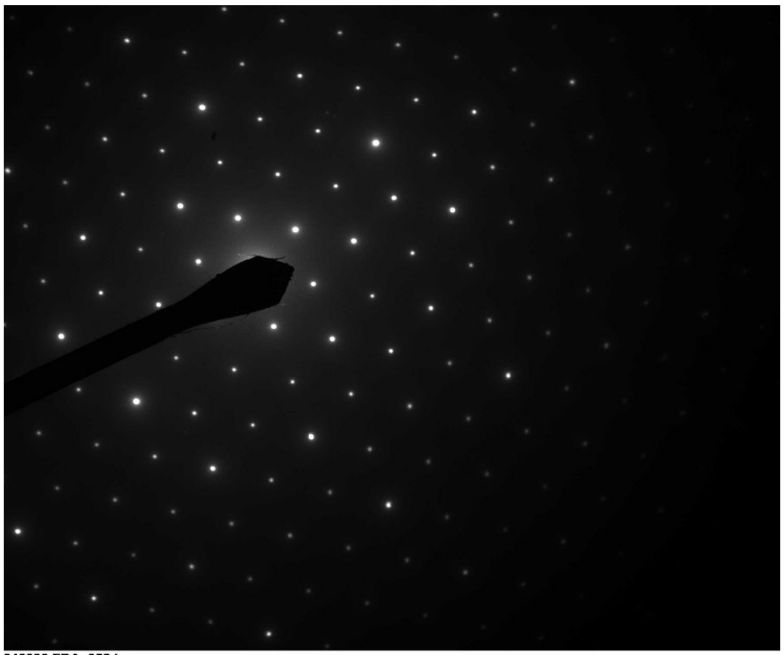


646090 FDA_059.jpg
646090-14
Talc Particle

Cal: 0.002145 µm/pix
12:17 2023-06-21
TEM Mode: Imaging
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

600 nm
HV=100kV
Direct Mag: 4800 x

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

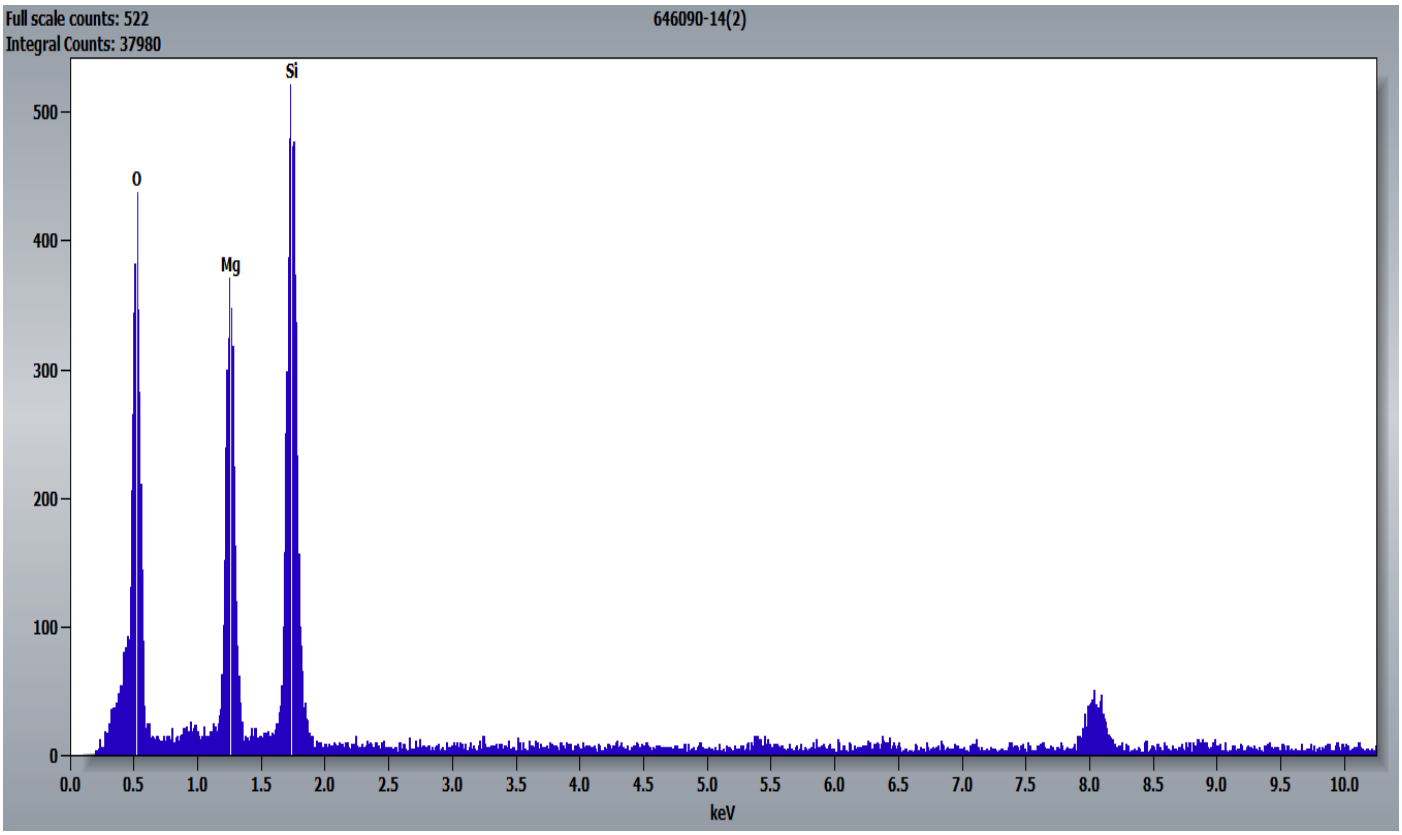


646090 FDA_058.jpg
646090-14
Talc Particle

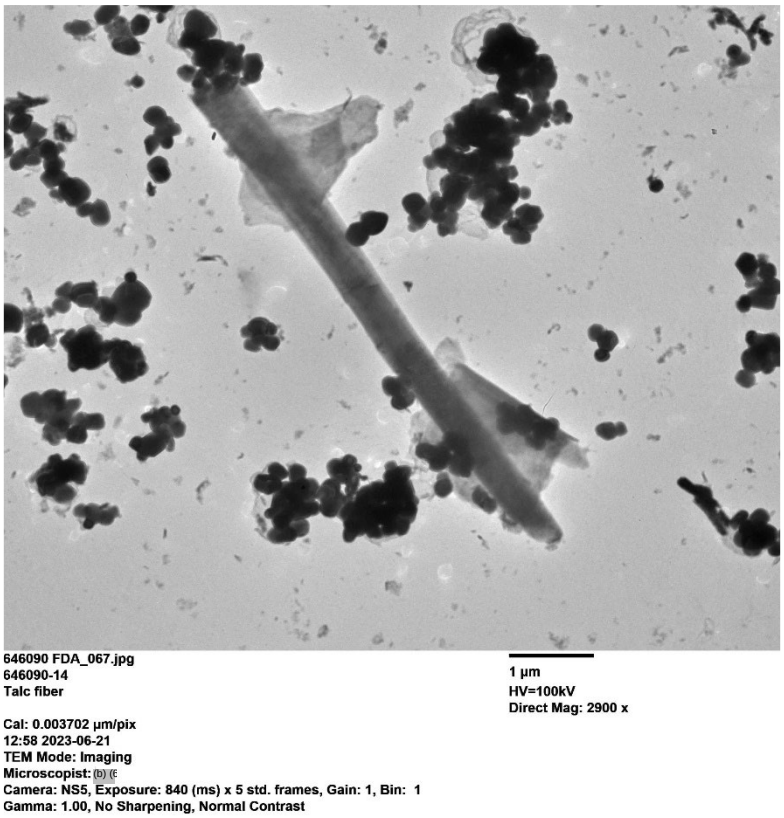
Cal: 0.001030 µm/pix
12:16 2023-06-21
TEM Mode: Diffraction
Microscopist: (b) (6
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

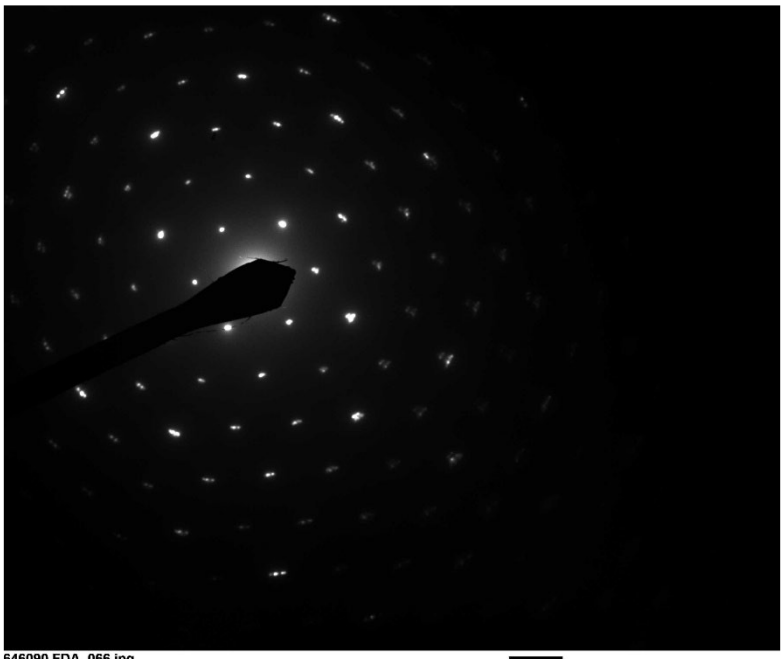
Chemistry from the Talc Particle Pictured Above



646090-14, Elongated Talc Particle



Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

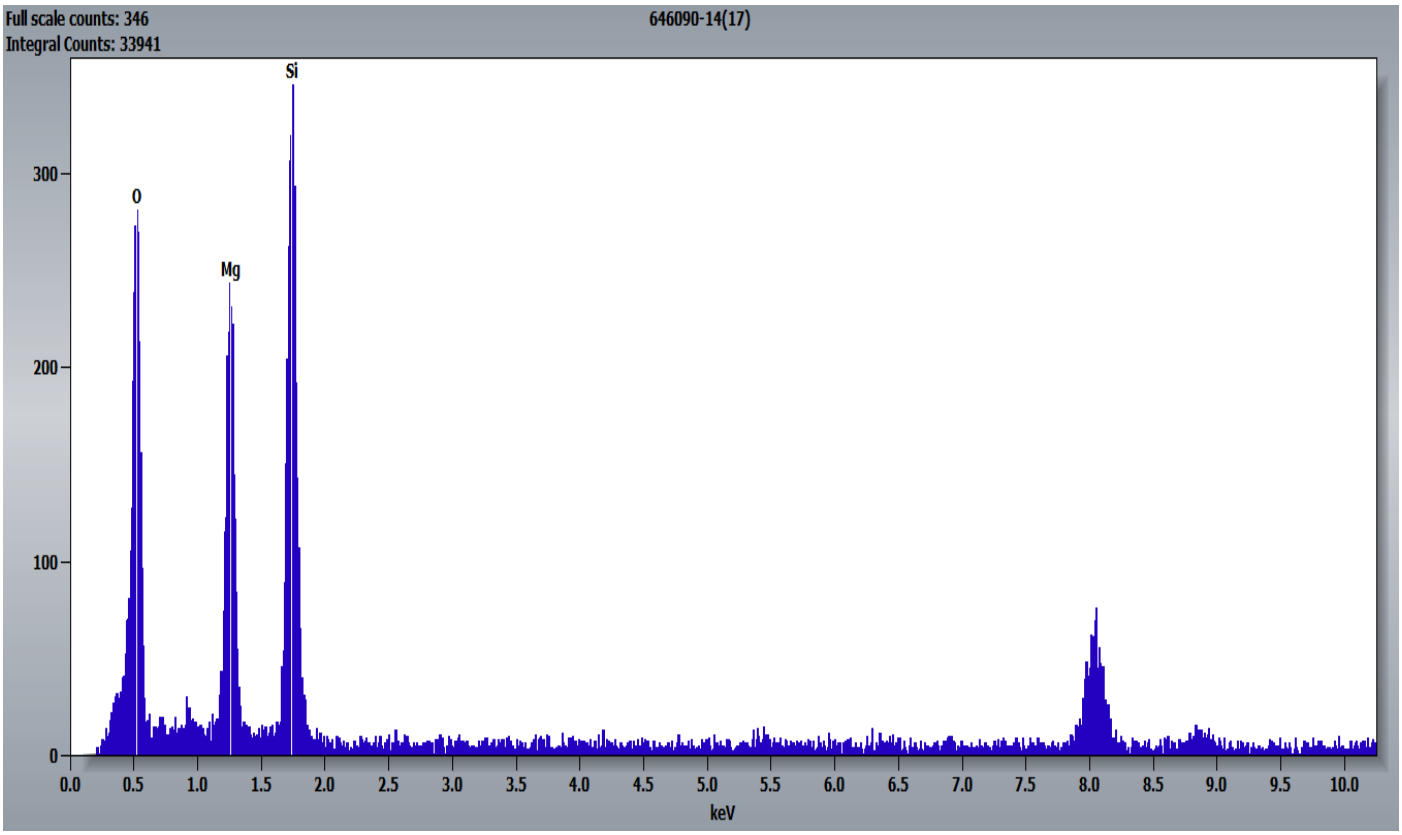


646090 FDA_066.jpg
646090-14
Talc fiber

Cal: 0.002145 µm/pix
12:56 2023-06-21
TEM Mode: Diffraction
Microscopist:
Camera: NS5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

0.2 $Å^{-1}$
HV=100kV
Cam Len: 0.2200 m

Chemistry from the Elongated Talc Particle 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 NB23-285/286, NB23-312, NB23-332/333, NB23-337, NB23-342, and NB23-354 were not analyzed since no asbestos was observed on the associated client samples. Matrix blank sample number NB23-336 was analyzed by Ashley Rose on July 17, 2023. Although it was not required, (b) (6) analyzed matrix blank sample numbers NB23-311, NB23-341, and NB23-353 on July 17, 2023. No asbestos was observed on the matrix blank samples that were analyzed.

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 646090-RB1, was analyzed with this set. It was analyzed by (b) (6) on July 10, 2023, and found to be within acceptable limits.

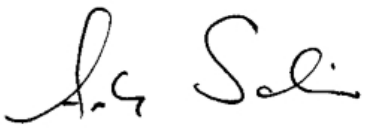
Filtration blank samples were prepared alongside the client samples with each use of the filtration apparatus. Analysis of these samples was only required on those blanks associated with a client sample on which asbestos, or the non-asbestos versions of the regulated minerals, was found unless otherwise noted. Filtration blank sample numbers 646090-DI01 through 646090-DI07 and 646090-DI09 through 646090-DI14 were not analyzed since no asbestos was observed on the associated client samples. Filtration blank sample number 646090-DI08 was analyzed by Michael Greenberg on July 10, 2023; no asbestos was observed on this sample.

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 60355 and 60410 were analyzed by (b) (6) on July 10, 2023. Although it was not required, (b) (6) also analyzed EB Blank ID 60476 on July 10, 2023. No asbestos was detected on the TEM grid preparation blank samples that were analyzed.

Our laboratory information management system (LIMS) randomly selected sample 646090-14/04032023-14.1 (Tube Labeled 14.4) 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 June 20, 2023, for PLM and by (b) (6) on July 18, 2023, for TEM. The QC results were consistent with the original findings.

Our laboratory information management system (LIMS) randomly selected samples 646090-1A/04032023-1 and 646090-12A/04032023-12 for additional replicate QC analysis. Independent preparations were made for the PLM and TEM portions of analysis. The PLM replicate QC analysis was performed by (b) (6) on June 20, 2023. (b) (6) performed TEM analysis on 646090-18RQC on July 17, 2023, and (b) (6) performed TEM analysis on 646090-19RQC on July 18, 2023. 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.



8/22/2023

Andreas Saldivar — Date
President