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: 75F40119P10689

Assignment DFPG# 22-08, Batch No. 03022022 (Batch #2)
AMA COC No. 634598

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: 634598
Client: US Food & Drug Administration
Address: Office of Cosmetics & Colors
4300 River Road
College Park, MD 20740
Attention: John Gasper

Job Name: Assignment DFPG #22-08
Job Location: Batch 2 (No. 03022022)
Job Number: CLIN 1001
PO Number: 75F40119P10689

Date Submitted: 3/22/2022
Date Analyzed: 4/5/2022 - 4/28/2022
Report Date: 8/4/2022
Date Sampled: Not Provided
Person Submitting: Martha Schwartz
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
634598-1A	03022022-1	0.00000294%	0.00001176%	ND	ND	< 0.00001%	ND	17.42%	5.82%	76.76%	
634598-1B	03022022-1	0.00000241%	0.00000965%	ND	ND	< 0.00001%	ND	17.41%	7.12%	75.47%	
634598-1C	03022022-1	0.00000281%	0.00001122%	ND	ND	< 0.00001%	ND	17.36%	7.14%	75.51%	
634598-2A	03022022-2	0.00000181%	0.00000726%	ND	ND	< 0.00001%	ND	51.18%	7.23%	41.59%	
634598-2B	03022022-2	0.00000189%	0.00000756%	ND	ND	< 0.00001%	ND	51.15%	6.02%	42.83%	
634598-2C	03022022-2	0.00000259%	0.00001036%	ND	ND	< 0.00001%	ND	51.20%	6.54%	42.26%	
634598-3A	03022022-3	0.00000201%	0.00000803%	ND	ND	< 0.00001%	ND	9.77%	4.92%	85.31%	
634598-3B	03022022-3	0.00000284%	0.00001135%	ND	ND	< 0.00001%	ND	9.81%	4.23%	85.96%	
634598-3C	03022022-3	0.00000298%	0.00001191%	ND	ND	< 0.00001%	ND	9.71%	5.33%	84.97%	
634598-4A	03022022-4	0.00000182%	0.00000728%	ND	ND	< 0.00001%	ND	21.09%	7.88%	71.03%	
634598-4B	03022022-4	0.00000169%	0.00000677%	ND	ND	< 0.00001%	ND	21.10%	7.16%	71.74%	
634598-4C	03022022-4	0.00000189%	0.00000756%	ND	ND	< 0.00001%	ND	21.06%	7.73%	71.21%	
634598-5A	03022022-5	0.00000280%	0.00001121%	ND	ND	< 0.00001%	ND	4.70%	9.05%	86.25%	
634598-5B	03022022-5	0.00000240%	0.00000960%	ND	ND	< 0.00001%	ND	4.62%	9.54%	85.84%	
634598-5C	03022022-5	0.00000277%	0.00001108%	ND	ND	< 0.00001%	ND	4.56%	9.27%	86.17%	
634598-6A	03022022-6	0.00000210%	0.00000840%	ND	ND	< 0.00001%	ND	9.58%	5.84%	84.58%	
634598-6B	03022022-6	0.00000268%	0.00001070%	ND	ND	< 0.00001%	ND	9.62%	5.97%	84.41%	
634598-6C	03022022-6	0.00000243%	0.00000972%	ND	ND	< 0.00001%	ND	9.55%	7.67%	82.78%	
634598-7A	03022022-7	0.00000275%	0.00001100%	ND	ND	< 0.00001%	ND	13.76%	9.45%	76.79%	
634598-7B	03022022-7	0.00000381%	0.00001525%	ND	ND	< 0.00002%	ND	14.04%	10.05%	75.91%	
634598-7C	03022022-7	0.00000248%	0.00000993%	ND	ND	< 0.00001%	ND	14.14%	8.65%	77.21%	
634598-8A	03022022-8	0.00000365%	0.00001458%	ND	ND	< 0.00001%	ND	5.56%	12.45%	81.99%	
634598-8B	03022022-8	0.00000305%	0.00001220%	ND	ND	< 0.00001%	ND	4.98%	12.04%	82.98%	
634598-8C	03022022-8	0.00000244%	0.00000978%	ND	ND	< 0.00001%	ND	4.92%	11.94%	83.14%	
634598-9A	03022022-9	0.00000257%	0.00001026%	ND	ND	< 0.00001%	ND	6.22%	12.31%	81.48%	
634598-9B	03022022-9	0.00000237%	0.00000947%	ND	ND	< 0.00001%	ND	6.21%	12.33%	81.46%	
634598-9C	03022022-9	0.00000313%	0.00001250%	ND	ND	< 0.00001%	ND	6.15%	12.40%	81.45%	
634598-10A	03022022-10	0.00000176%	0.00000706%	ND	ND	< 0.00001%	ND	9.07%	7.47%	83.47%	
634598-10B	03022022-10	0.00000198%	0.00000792%	ND	ND	< 0.00001%	ND	9.04%	6.88%	84.08%	
634598-10C	03022022-10	0.00000230%	0.00000920%	ND	ND	< 0.00001%	ND	9.06%	6.49%	84.45%	
634598-11A	03022022-11	0.00000302%	0.00001208%	ND	ND	< 0.00001%	ND	36.71%	6.95%	56.34%	
634598-11B	03022022-11	0.00000188%	0.00000754%	ND	ND	< 0.00001%	ND	36.74%	6.97%	56.29%	
634598-11C	03022022-11	0.00000270%	0.00001081%	ND	ND	< 0.00002%	ND	36.79%	9.44%	53.77%	

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

AMA Analytical Services, Inc.

Focused On Results. **CERTIFICATE OF ANALYSIS**

Chain of Custody: 634598
Client: US Food & Drug Administration
Address: Office of Cosmetics & Colors
4300 River Road
College Park, MD 20740
Attention: John Gasper

Job Name: Assignment DFPG #22-08
Job Location: Batch 2 (No. 03022022)
Job Number: CLIN 1001
PO Number: 75F40119P10689

Date Submitted: 3/22/2022
Date Analyzed: 4/5/2022 - 4/28/2022
Report Date: 8/4/2022
Date Sampled: Not Provided
Person Submitting: Martha Schwartz
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

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 634598

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.) **634598**

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 #22-08
Job Location: Batch 2 (No. 03022022)
Job #: CLIN 1001 P.O. #: 75F40119P10689
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: 4/29/2022 ☑ 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 11 (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 11	3	11 '1-oz glass jars submitted in pink vacuum sealed plastic bags	
		with custody seals intact (sealed by M. Schwartz 3/3/2022-3/14/2022)	
		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)		3/22/2022	09:50	1Z2R3A600101821715

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

March 18, 2022

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

Re: Samples for Asbestos Analysis, Batch #03022022

Dear (b) (6)

Enclosed in box are eleven (11) approx. 5-g samples of commercial talc-containing cosmetic products being submitted for analysis for asbestiform fibers by transmission electron microscope (TEM) per FDA Assignment DFPG #22-08, Contract No. #75F40119P10689. 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.

Note that the original batch size was to be twelve (12) samples. Due to some collection issues, one sample was delayed. That sample is going to be held for the next batch which we will send to you sometime in April.

The eleven (11) samples in this shipment constitute Batch 2 (No. 03022022) of the 50 samples that will be submitted to AMA for analysis in 2022.

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

Best regards,

Martha H. Schwartz
Chemist

Chemistry Branch
Denver Laboratory
Office of Regulatory Affairs
U.S. Food and Drug Administration
T: 303-236-9653
martha.schwartz@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: ____03022022_____

Submitter: ___Martha H. Schwartz_____

Assignment No./ Contract No.:___DFPG #22-08 / #75F40119P10689_____

AMA COC No.: _____

Date Sealed: ___3/18/2021_____ Sample Type: ___Official Samples_____

Description of Evidence		
Item #	**Quantity**	**Description of Item** (Lab#, Lot #, Condition)
03022022-1	1	Approx. 5 g of prepared talc-containing cosmetic sample
03022022-2	1	
03022022-3	1	
03022022-4	1	
03022022-5	1	
03022022-6	1	
03022022-7	1	
03022022-8	1	
03022022-9	1	
03022022-10	1	
03022022-11	1	

Martha H. Schwartz 3/18/22

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.

Chain of Custody				
Item #	**Date**	**Released by** (Print Name)	**Released by** (Signature)	**Comments/Location**
03022022-1-11	3/18/22	Martha H. Schwartz	Martha H. Schwartz	ORS DENL

Chain of Custody				
Item #	**Date/Time**	**Received by**	**Received by**	**Comments/Location**
1-11	3/22/2022	(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.

Witness to Destruction of Evidence

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

Release to Lawful Owner

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

Signature: _____ Date: _____

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

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

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

UPS Delivery Confirmation

DRU MORRISON
1-303-236-3065
FDA-ORA-LAB-COLORADO
6TH AVENUE & KIPLING STREET
DENVER CO 80225

3 LBS

1 OF 1

SHIP TO:
(b) (6)
301-459-2640
AMA ANALYTICAL SERVICED, INC.
4475 FORBES BLVD.
LANHAM MD 20706-4354

MD 201 9-17

UPS NEXT DAY AIR

1

TRACKING #: 1Z 2R3 A60 01 0182 1715

BILLING: P/P

Test Don: ORA HQ
Center/Office: DEN DO

CS 22.0.18. WNTNV50 13.0A 03/2022*

TM

Proof of Delivery

Dear Customer,

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

Tracking Number
1Z2R3A600101821715

Weight
3.00 LBS

Service
UPS Next Day Air®

Shipped / Billed On
03/21/2022

Delivered On
03/22/2022 9:50 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: 03/30/2022 1:53 P.M. EST

From: UPS
To: (b) (6)
Subject: UPS Status Notification, Tracking Number 1Z2R3A600101821715
Date: Wednesday, March 30, 2022 1:27:59 PM

Please see below for package information and current transit status.

Scheduled Delivery Date: Tuesday, 03/22/2022

UPS My Choice for home

Shipment Details

Tracking Detail

Your package is on time with a scheduled delivery date of 03/22/2022

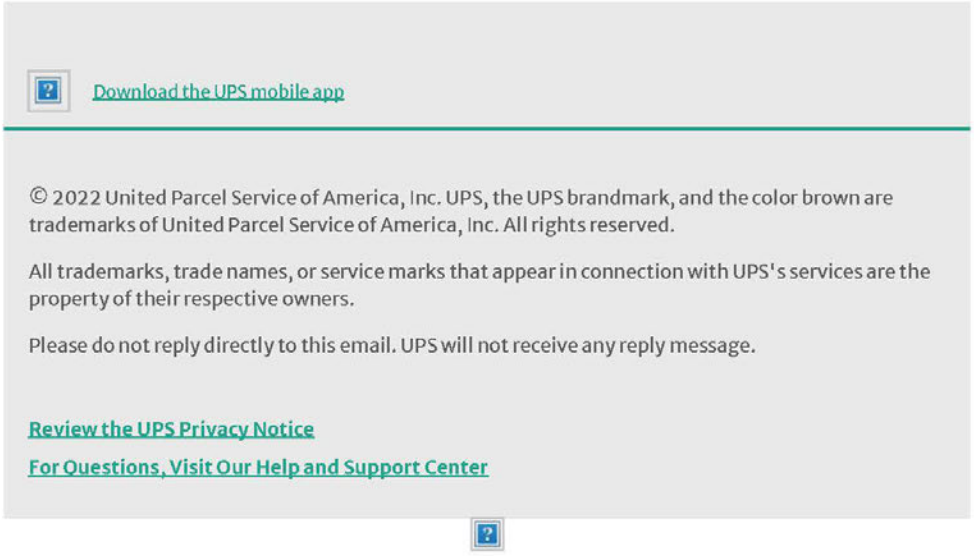
Tracking Number:	1Z2R3A600101821715
Status:	Delivered
Scheduled Delivery:	03/22/2022
Shipped To:	LANHAM, MD, US
UPS Service:	UPS Next Day Air®
Number of Packages:	1
Weight:	3.0 LBS

Package Progress

Location	Date	Local Time	Description
LANHAM, MD, US	03/22/2022	9:50 AM	DELIVERED
Landover, MD, United States	03/22/2022	9:02 AM	Out For Delivery Today
Landover, MD, United States	03/22/2022	7:35 AM	Loaded on Delivery Vehicle

Landover, MD, United States	03/22/2022	7:09 AM	Processing at UPS Facility
Landover, MD, United States	03/22/2022	6:55 AM	Processing at UPS Facility
Landover, MD, United States	03/22/2022	6:55 AM	Arrived at Facility
Linthicum, MD, United States	03/22/2022	6:15 AM	Departed from Facility
Linthicum, MD, United States	03/22/2022	5:38 AM	Arrived at Facility
Rockford, IL, United States	03/22/2022	3:02 AM	Departed from Facility
Rockford, IL, United States	03/22/2022	12:48 AM	Arrived at Facility
Commerce City, CO, United States	03/21/2022	9:52 PM	Departed from Facility
Commerce City, CO, United States	03/21/2022	8:37 PM	Arrived at Facility
Commerce City, CO, United States	03/21/2022	7:31 PM	Origin Scan
Commerce City, CO, United States	03/21/2022	1:26 PM	Pickup Scan
United States	03/21/2022	8:43 AM	Shipper created a label, UPS has not received the package yet.

Tracking results provided by UPS 03/30/2022 1:27 P.M. Eastern Time



Case Narrative

Client Name: FDA Office of Cosmetics & Colors **Contact:** John Gasper

Contract Number:	75F40119P10689	**Phone:**	(240) 402-1133
Job Name/Location:	Assignment DFPG# 22-08 Batch No. 03022022 (Batch #2)	**Email:**	john.gasper@fda.hhs.gov
AMA COC Number:	634598	**Date Received:**	March 22, 2022

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
634598-1A	03022022-1	Nude colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-1B	03022022-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-1C	03022022-1		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-2A	03022022-2	White colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-2B	03022022-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-2C	03022022-2		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-3A	03022022-3	Cream colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-3B	03022022-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-3C	03022022-3		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-4A	03022022-4	Off-white colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-4B	03022022-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-4C	03022022-4		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-5A	03022022-5	White colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-5B	03022022-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-5C	03022022-5		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-6A	03022022-6	Cream colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-6B	03022022-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-6C	03022022-6		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-7A	03022022-7	Cream colored, fine powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4

AMA Sample No.	Client Sample No.	Sample Description	Analytical Method
634598-7B	03022022-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-7C	03022022-7		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-8A	03022022-8	Gray colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-8B	03022022-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-8C	03022022-8		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-9A	03022022-9	Nude colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-9B	03022022-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-9C	03022022-9		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-10A	03022022-10	Off-white colored, slightly clumpy powder with a matte appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-10B	03022022-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-10C	03022022-10		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-11A	03022022-11	Very pale pink colored, fine powder with a pearlescent appearance	Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-11B	03022022-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4
634598-11C	03022022-11		Mod. PLM ELAP 198.6/TEM ELAP 198.4

Summary of Samples Received 1

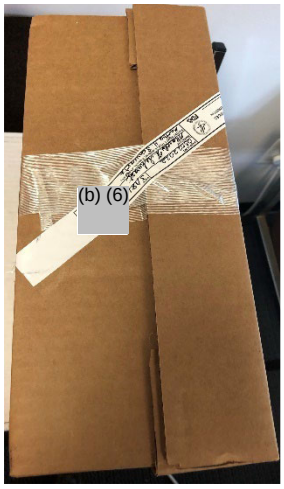
Requested Analyses: PLM Analysis for asbestos fibers conducted by Modified NY ELAP Method 198.6 and TEM Analysis for asbestos fibers conducted by Modified NY ELAP Method 198.4

Sample Receipt Description

The samples were received at AMA Analytical Services, Inc. on March 22, 2022, at 09:50 via UPS Tracking No. 1Z2R3A600101821715 by (b) (6), who assigned them to Chain of Custody (COC) No. 634598. This COC number served as the internal laboratory job number for tracking purposes. The set consisted of eleven (11) powder samples submitted in ~1-oz glass jars; each jar was sealed with parafilm and individually packaged in a 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 March 30, 2022, at 13:43 by (b) (6). The samples were logged in for analysis in triplicate and each sample aliquot was assigned a unique laboratory identification number as shown in the table above. After sample login, the set was transferred to AMA's lockbox for storage.

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

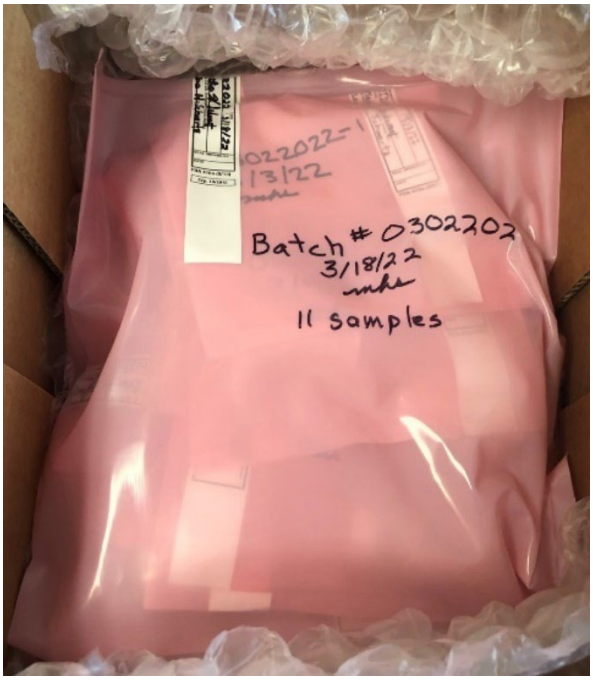

MD 2019-17
UPS NEXT DAY AIR
1

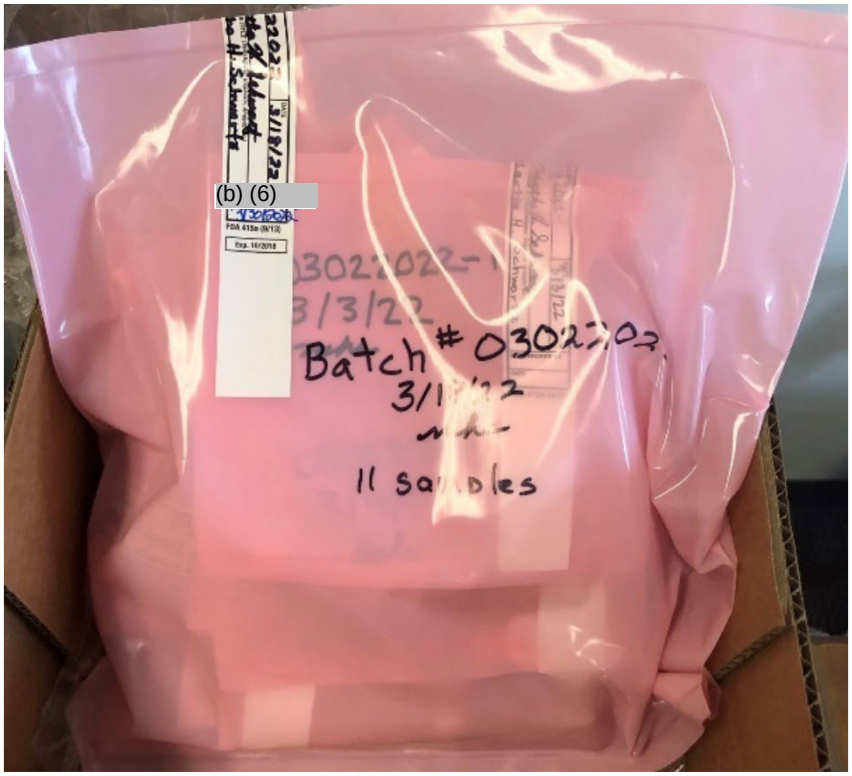

(b) (6)


(b) (6)


(b) (6)

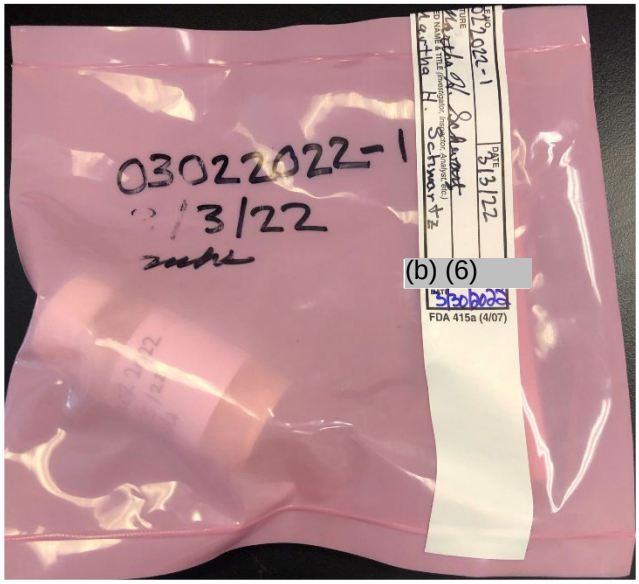

(b) (6)

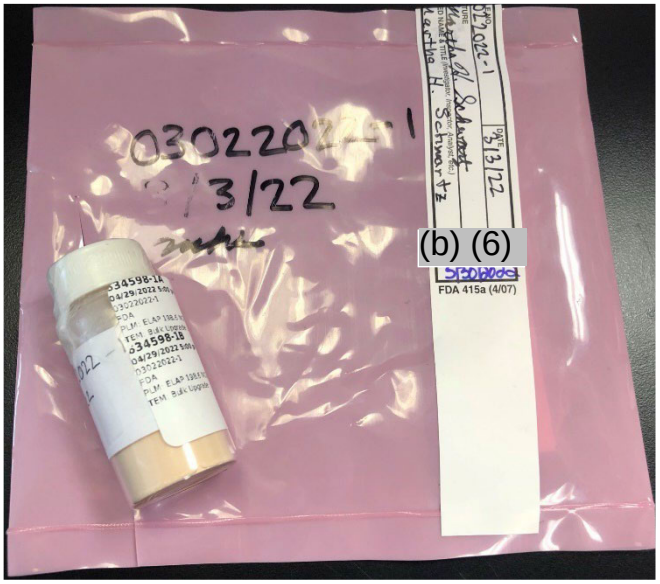

Batch # 0302202
3/18/22
11 samples

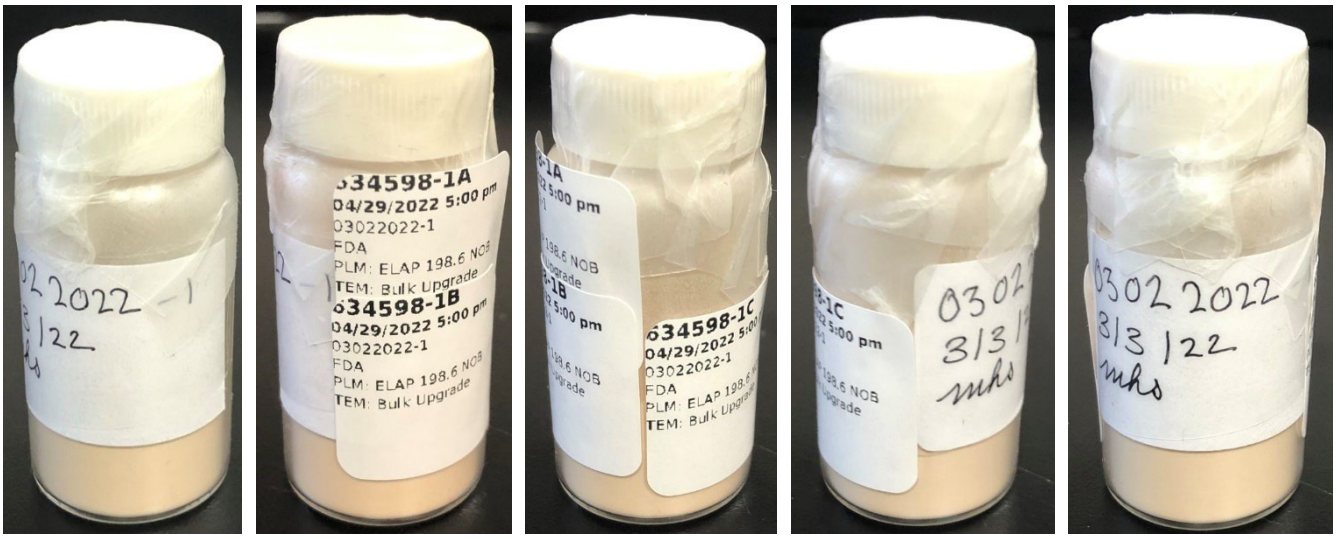

(b) (6)
Batch # 0302202
3/3/22
11 sandles

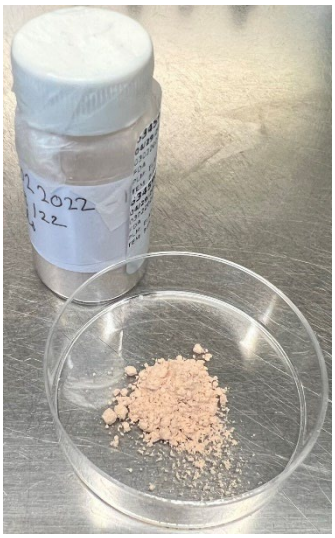

03022022-1
3/3/22
mks
03022022-4
3/7/22
mks
03022022-6
3/9/22
mks
03022022-2
3/4/22
mks
03022022-5
3/8/22
mks
03022022-9
3/11/22
mks
03022022-3
3/4/22
mks
03022022-8
3/8/22
mks
03022022-10
3/11/22
mks
03022022-7
3/8/22
mks
03022022-11
3/14/22
mks
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION
DENL

634598-1A, 1B, 1C/03022022-1

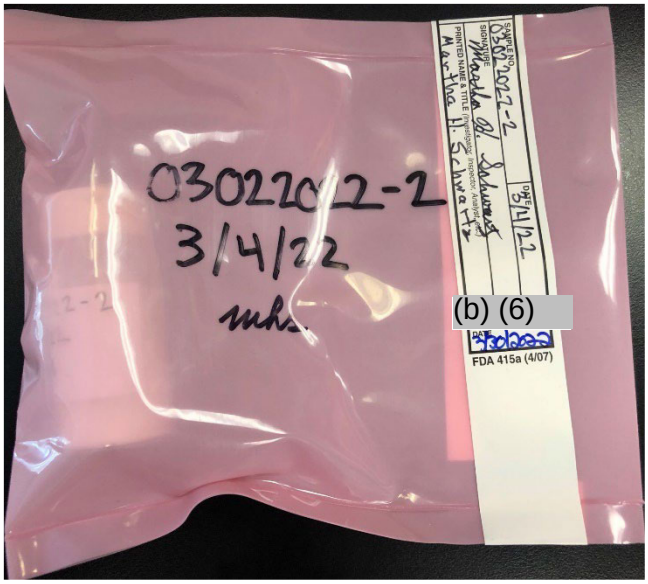


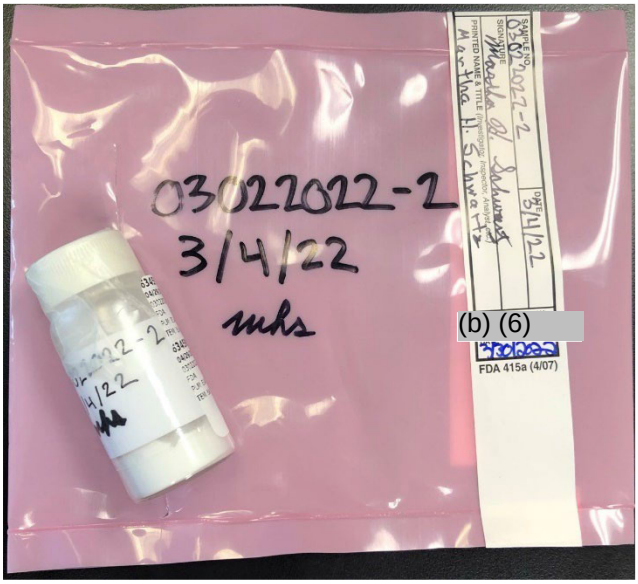


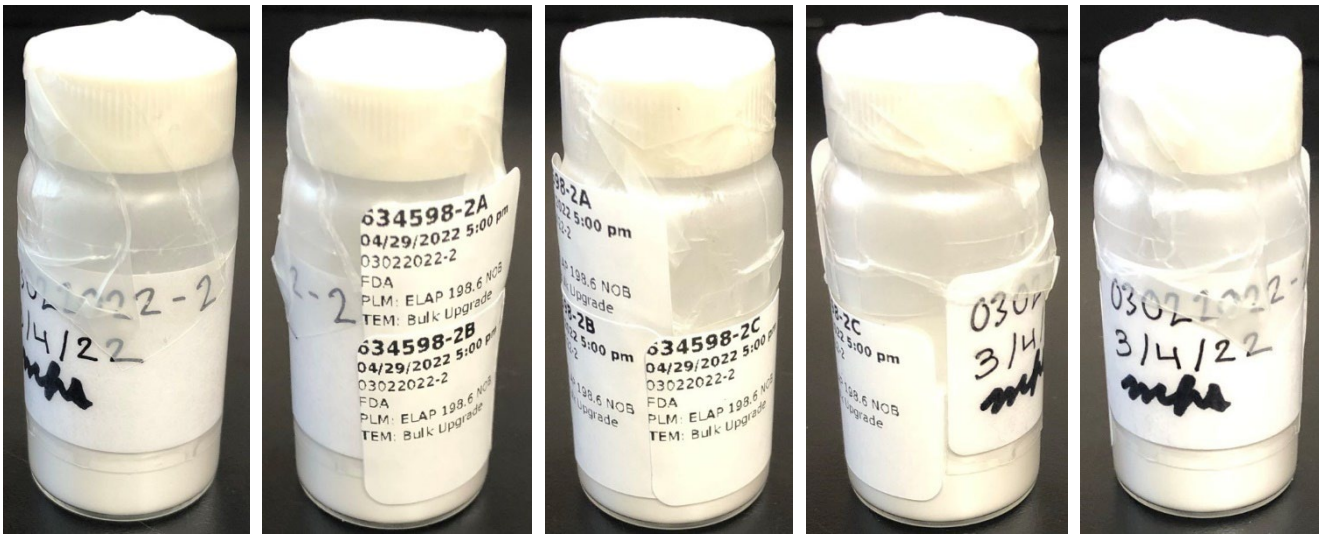


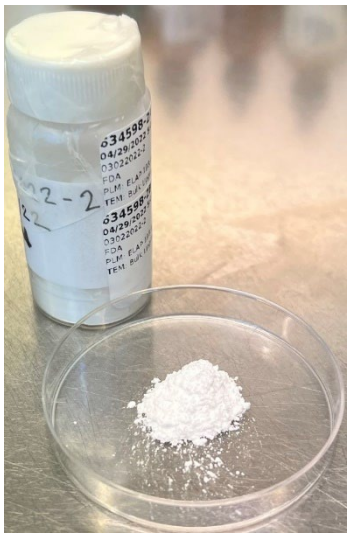


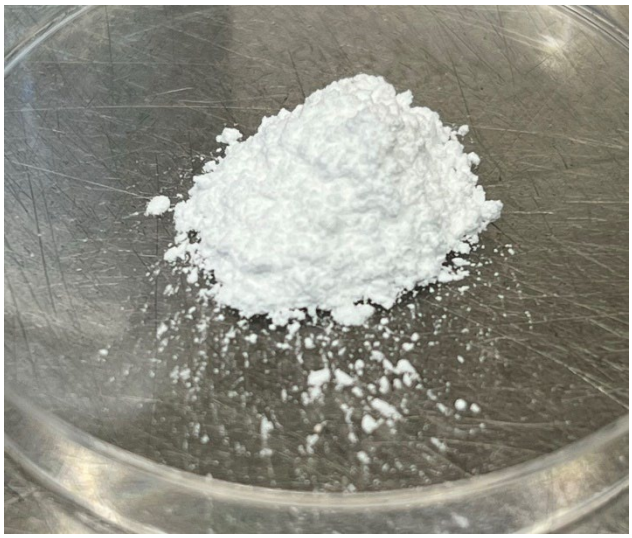
634598-2A, 2B, 2C/03022022-2



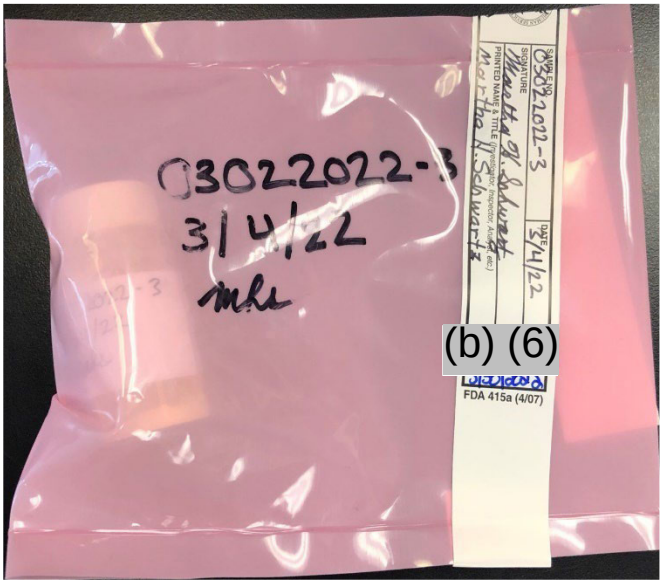


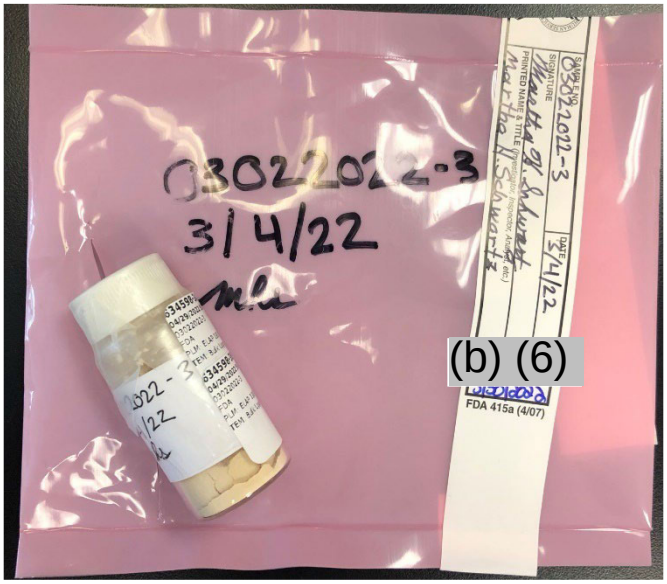


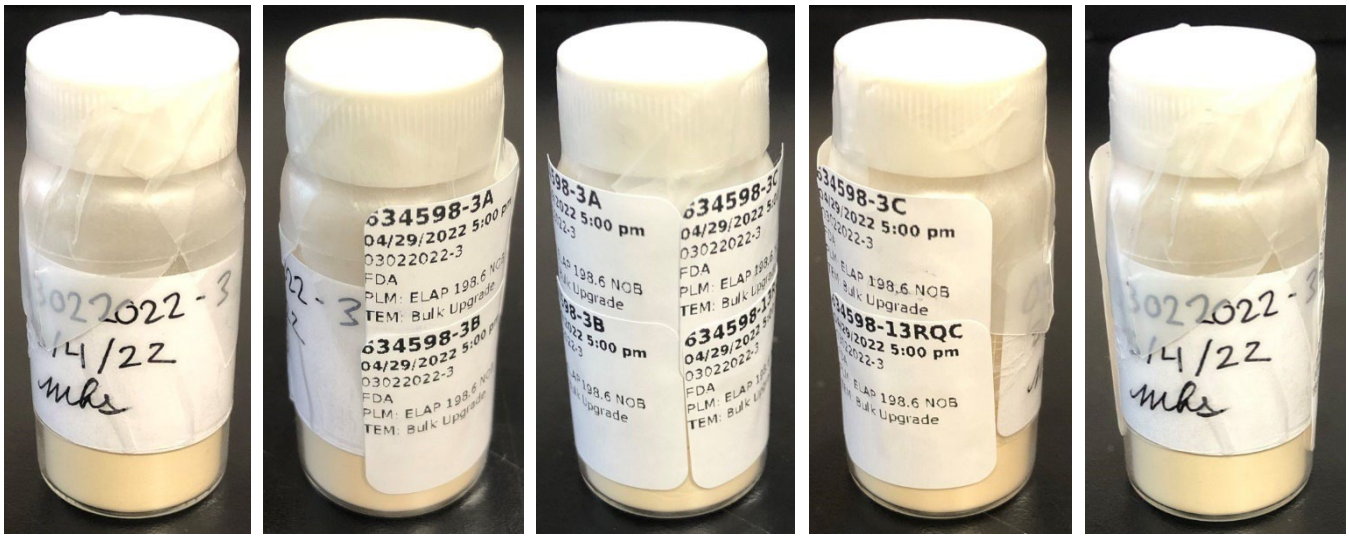


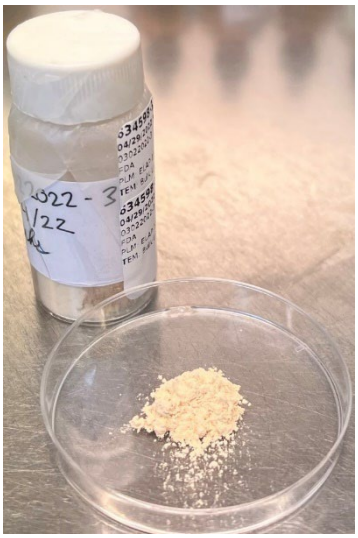


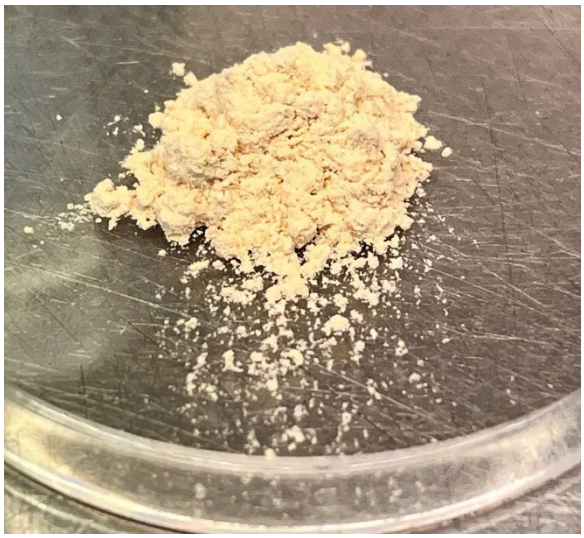
634598-3A, 3B, 3C/02212022-3



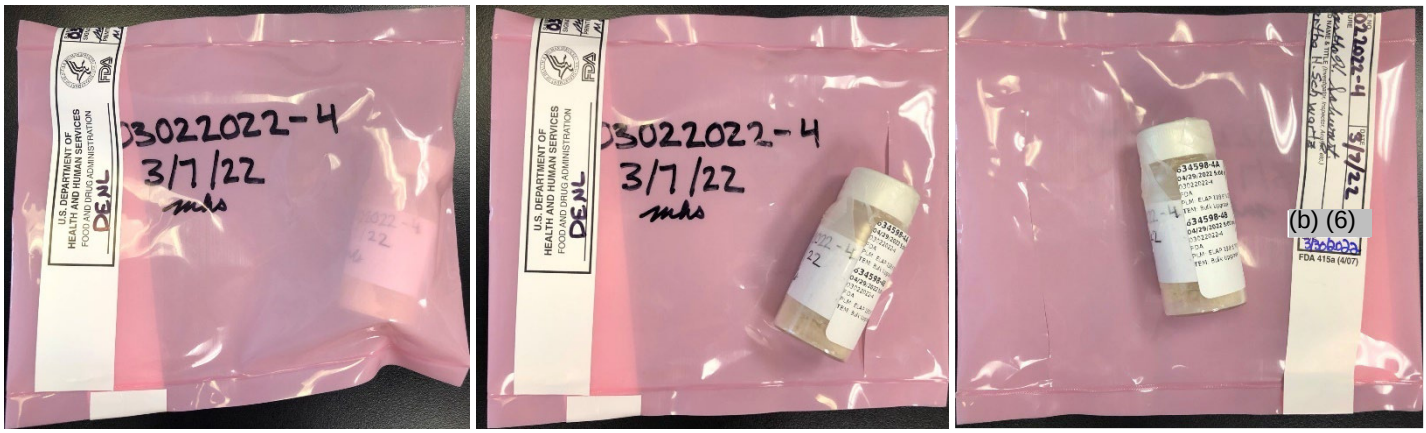


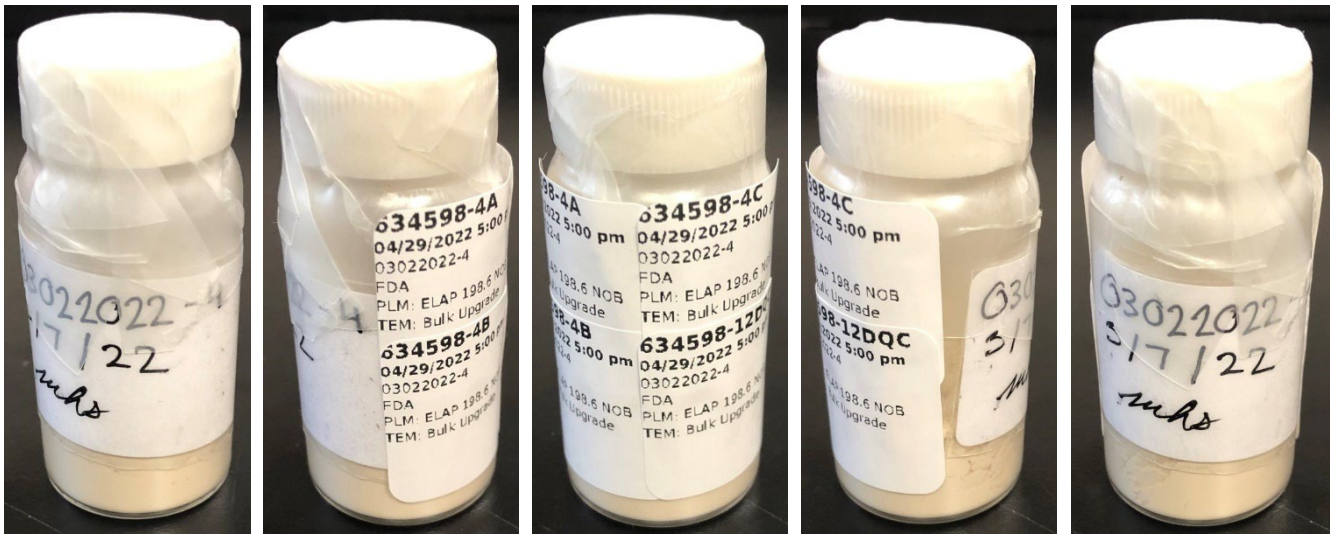


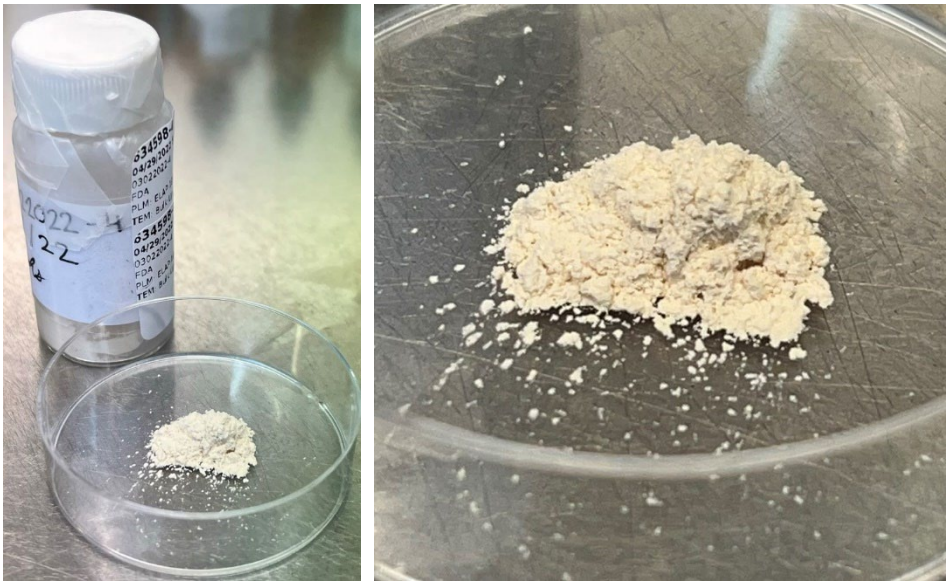




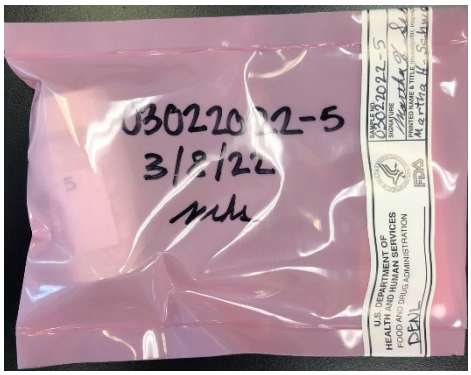
634598-4A, 4B, 4C/02212022-4

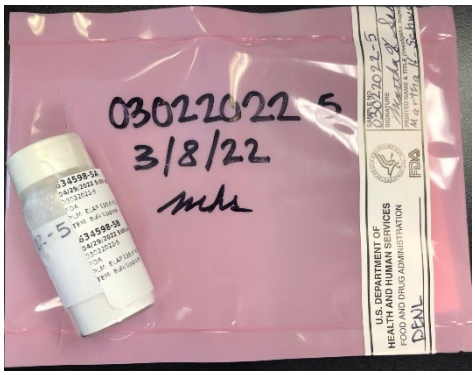


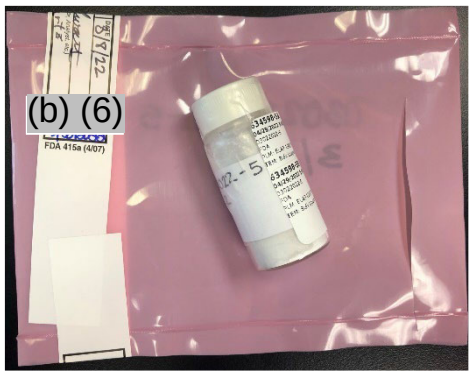


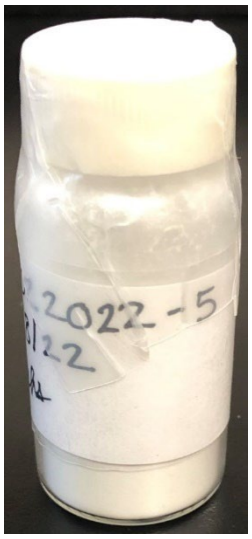


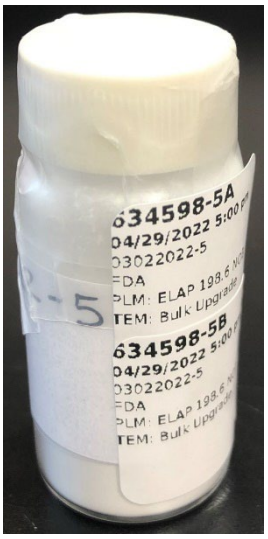
634598-5A, 5B, 5C/03022022-5

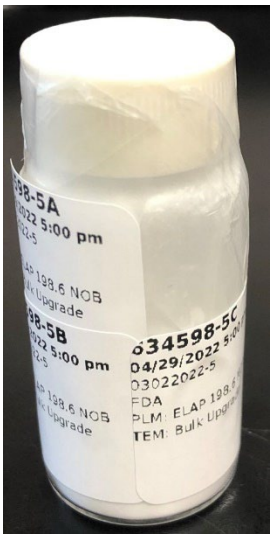


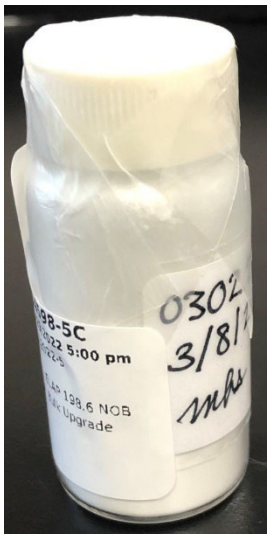


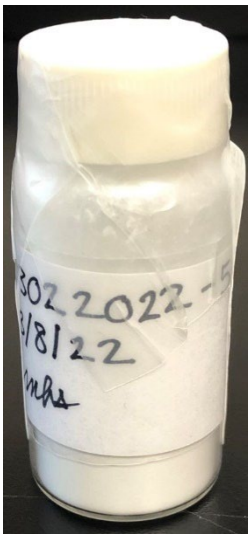


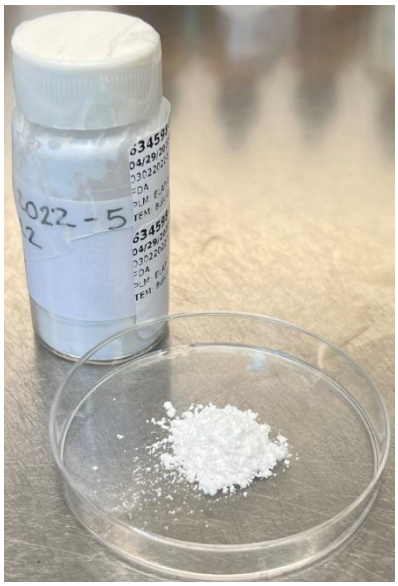


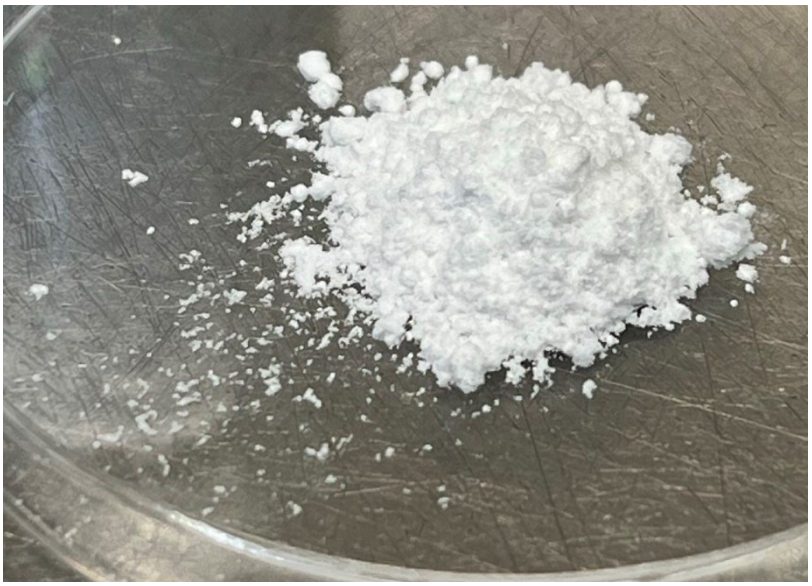




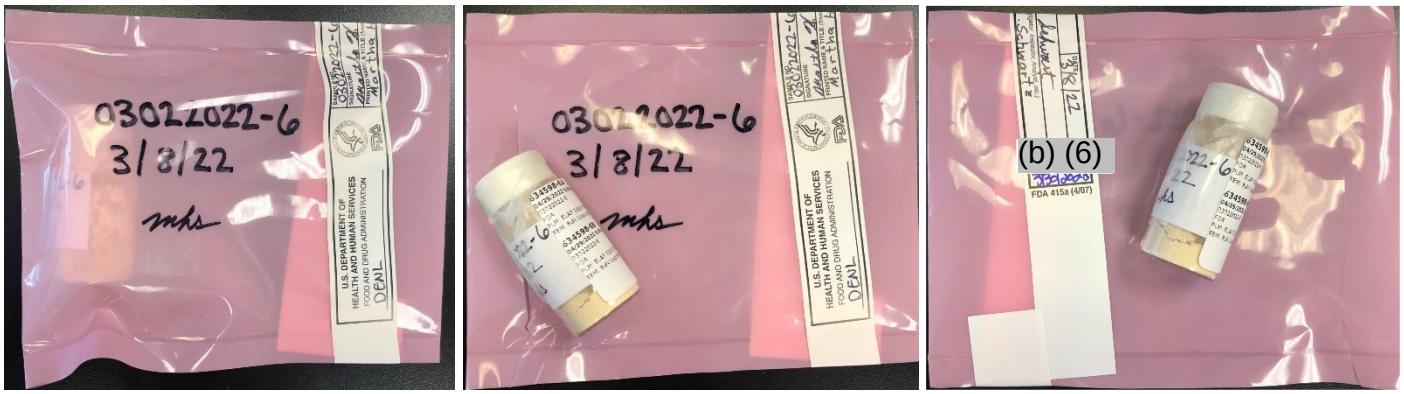


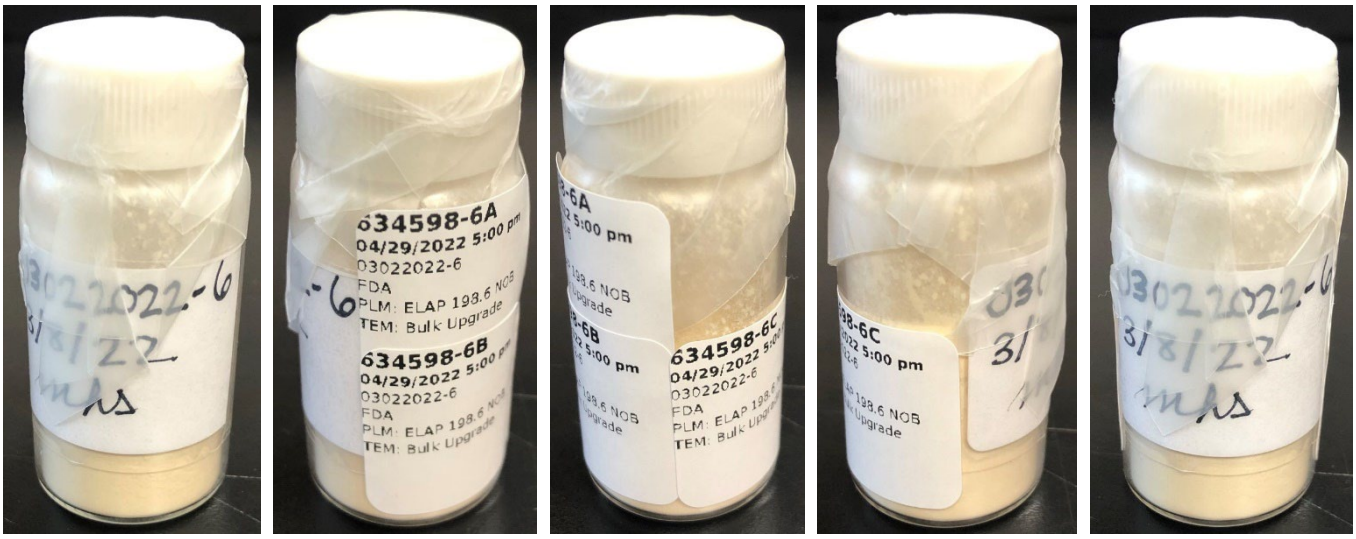


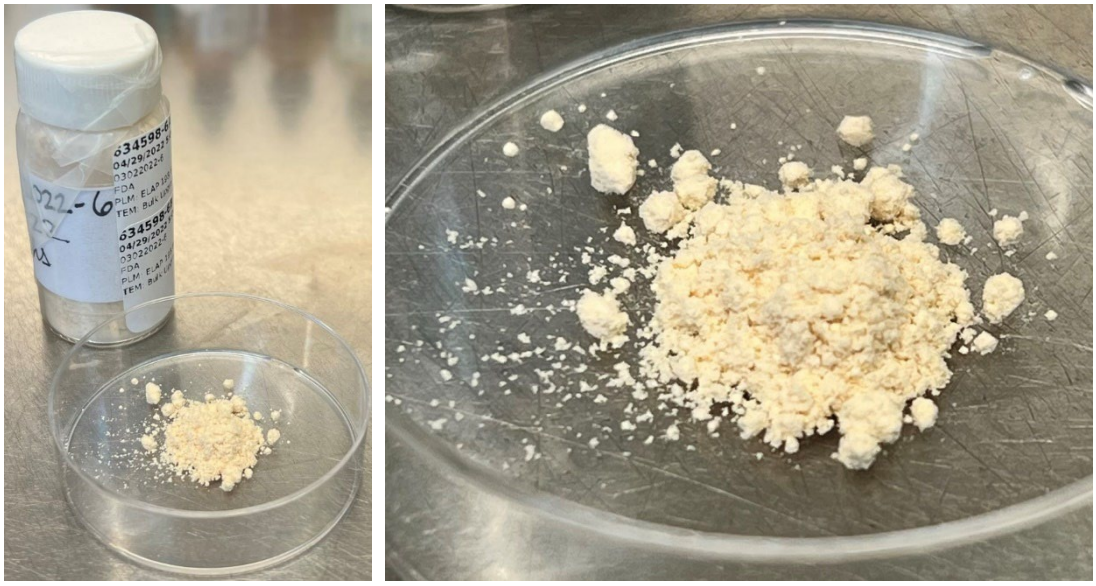




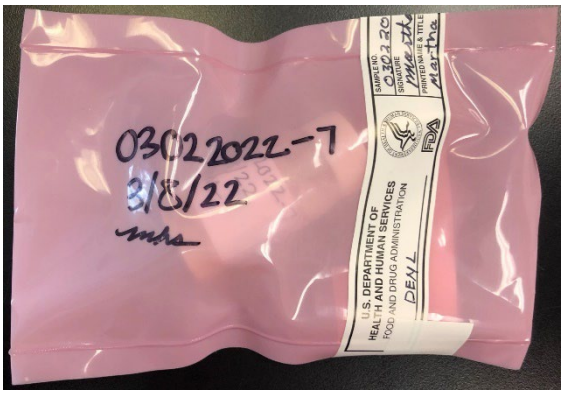
634598-6A, 6B, 6C/03022022-6

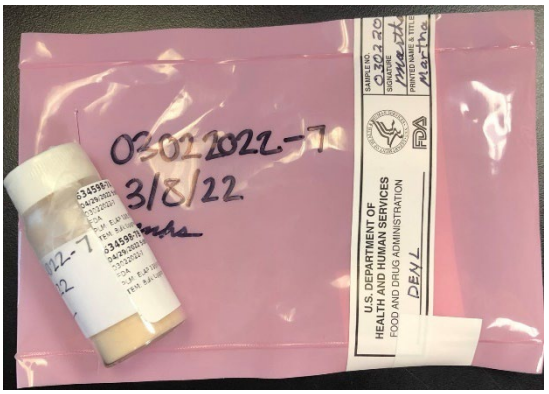


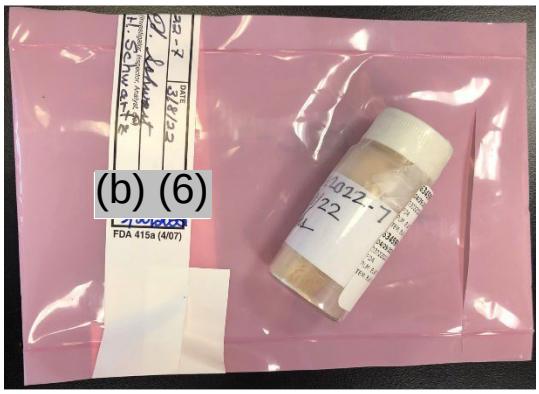


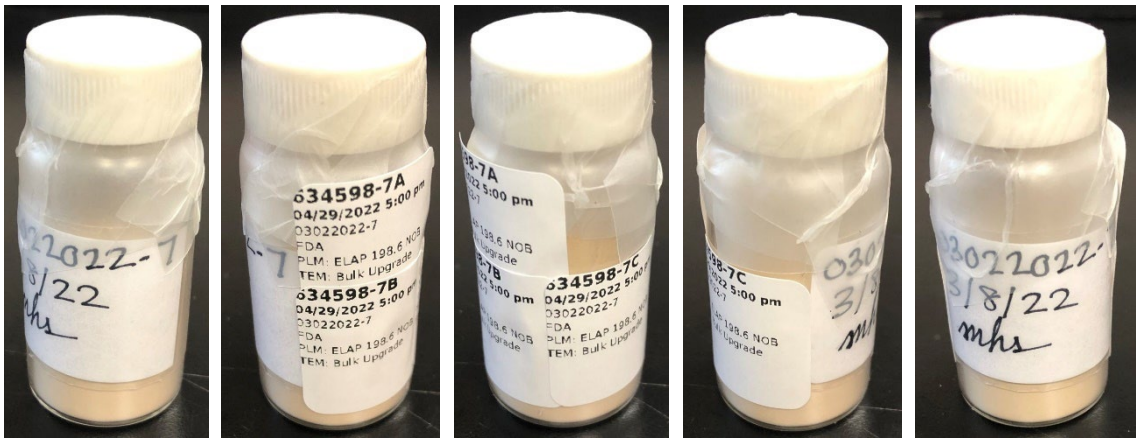


634598-7A, 7B, 7C/03022022-7

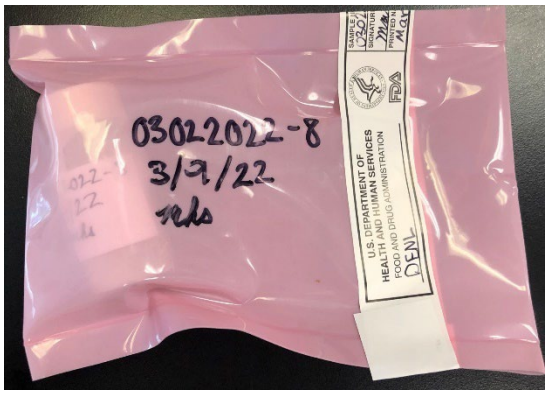


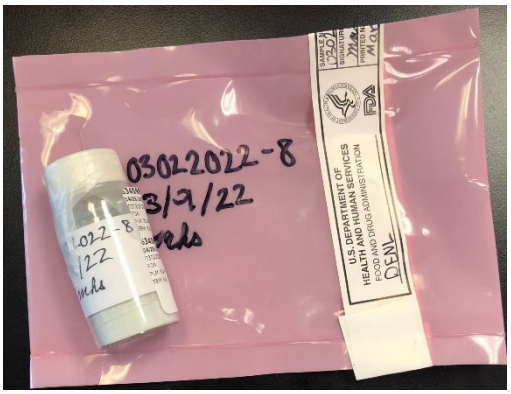


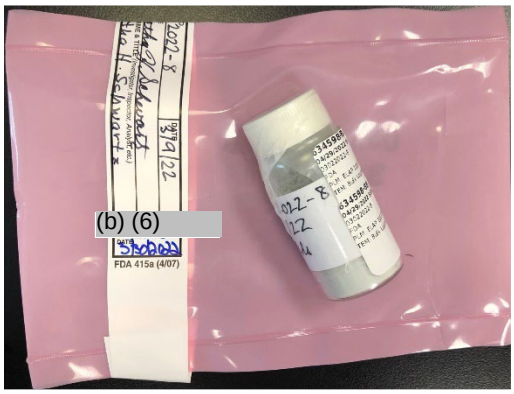


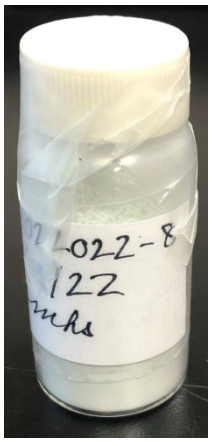


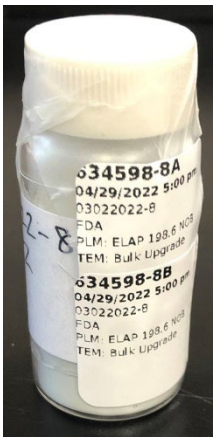
634598-8A, 8B, 8C/03022022-8

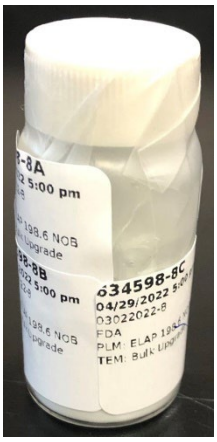


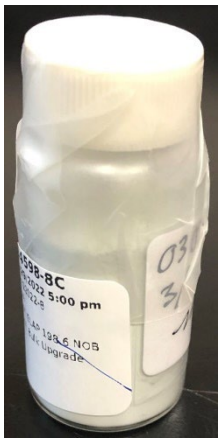


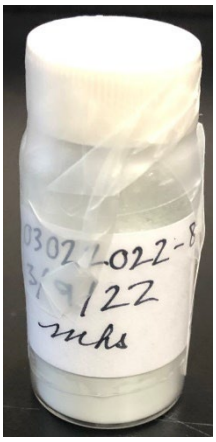


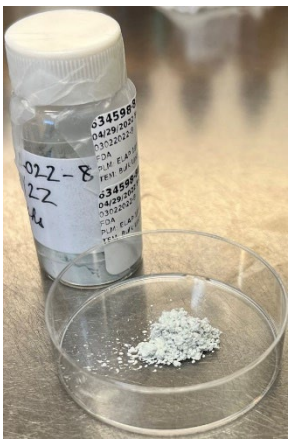




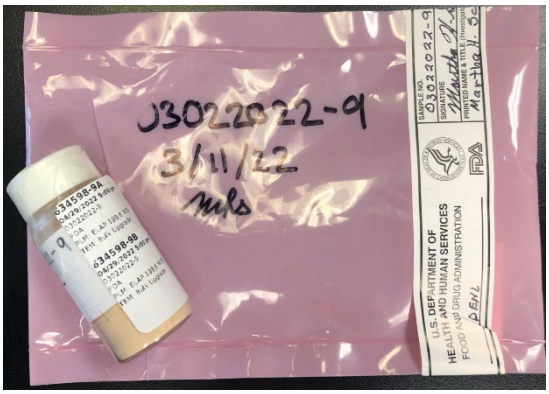


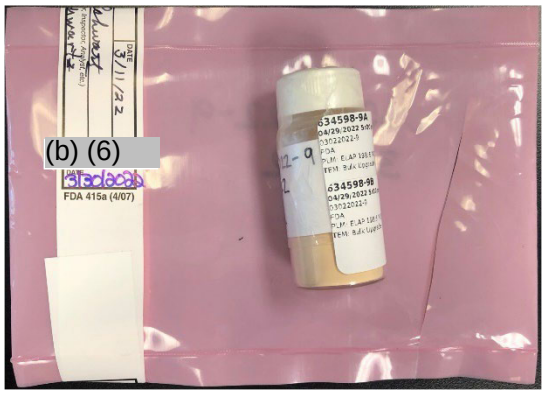


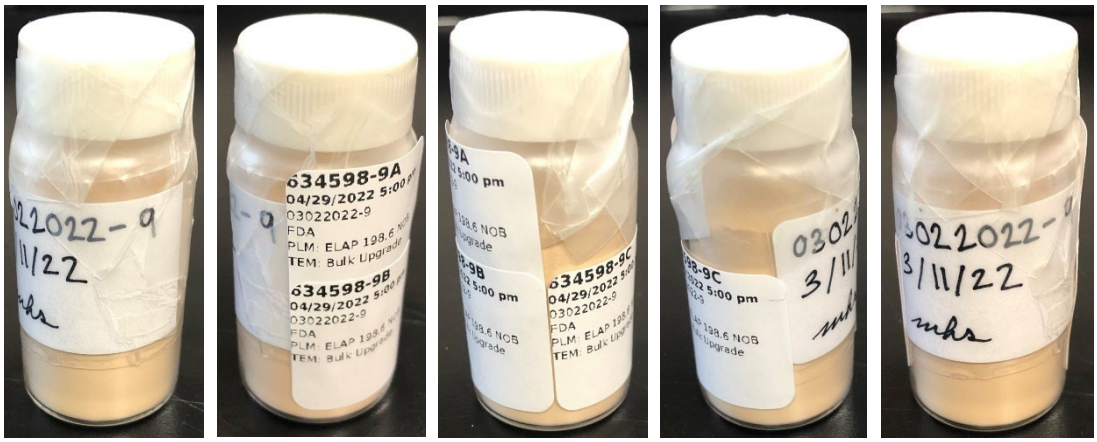


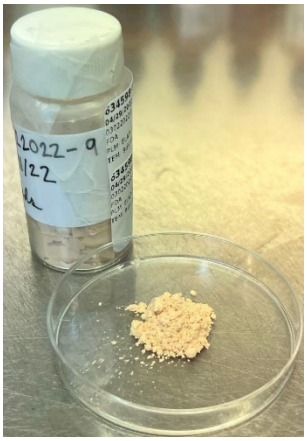


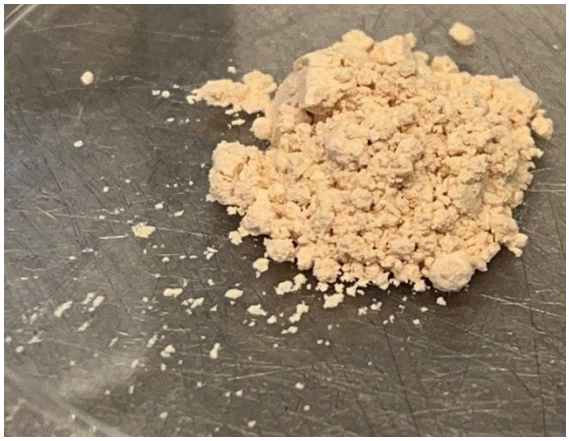
634598-9A, 9B, 9C/03022022-9



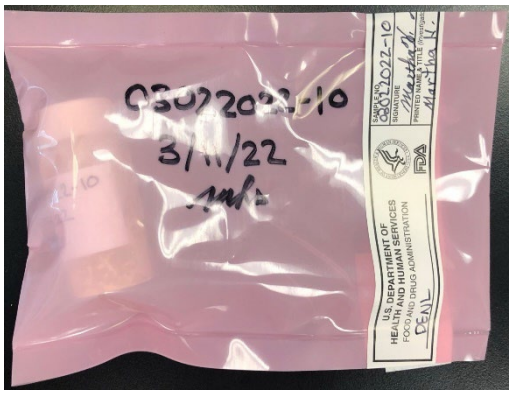


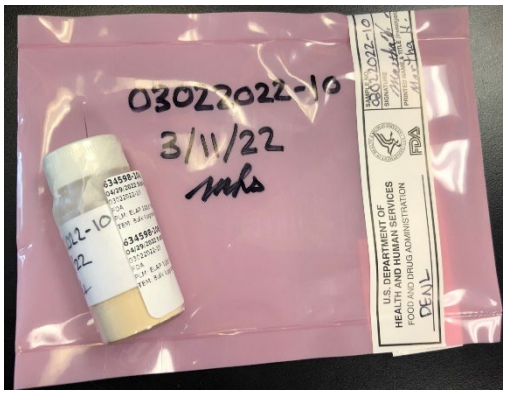


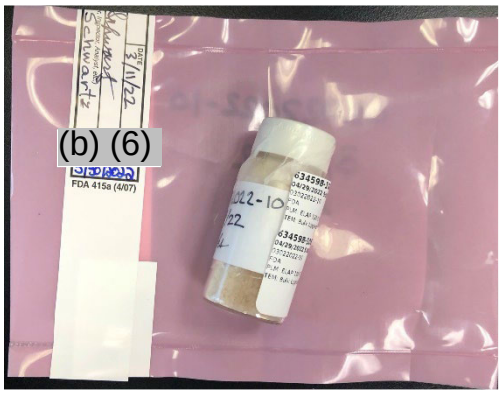


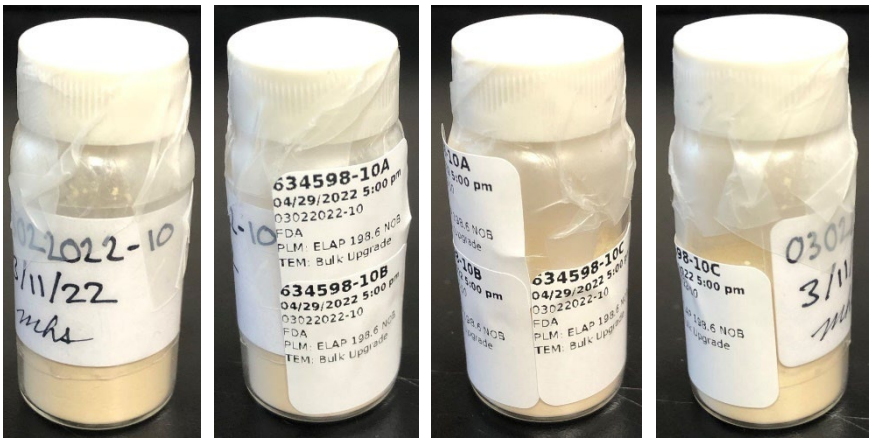


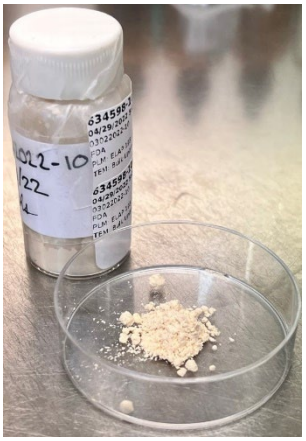
634598-10A, 10B, 10C/03022022-10

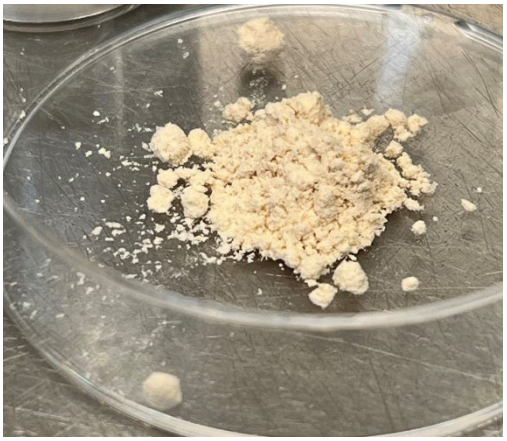




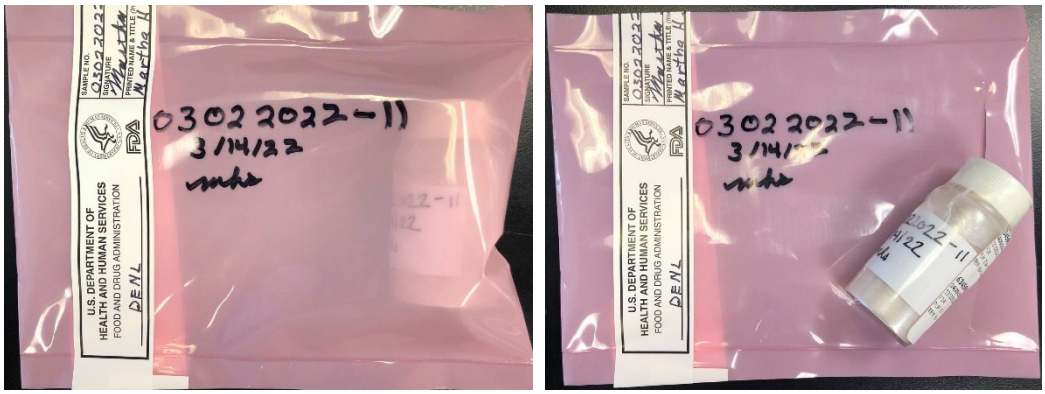


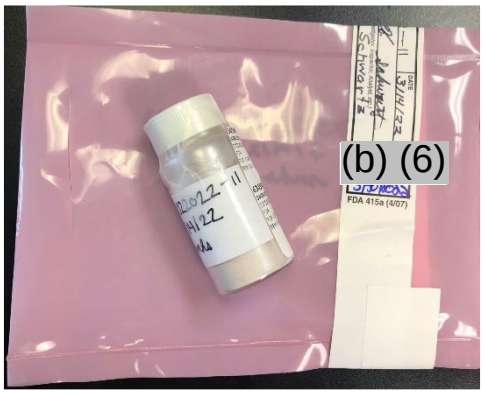


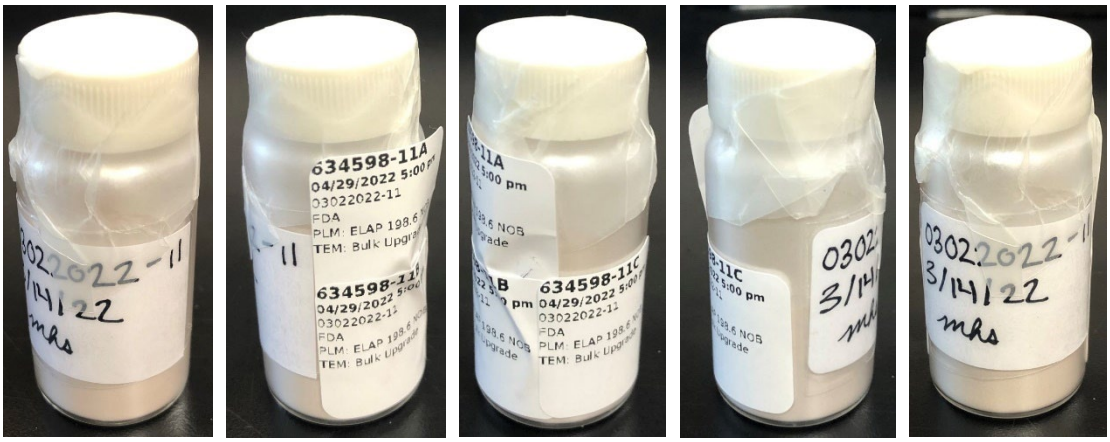


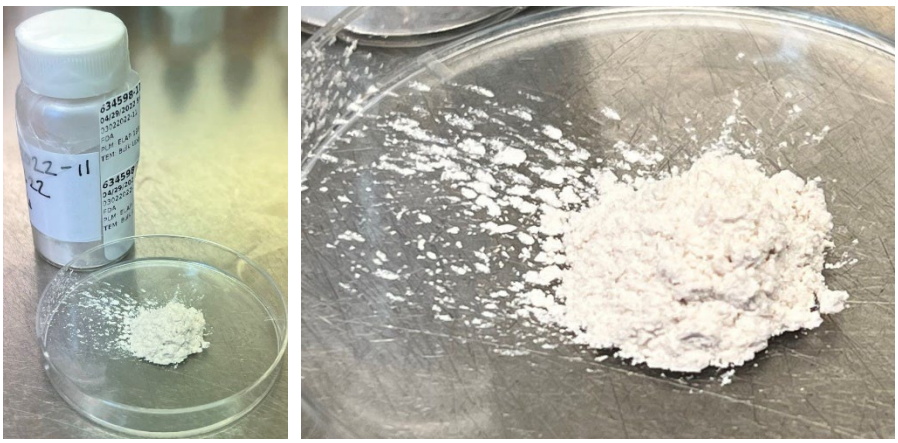


634598-11A, 11B, 11C/03022022-11









Sample Preparation

Samples were gravimetrically reduced and filtered by (b) (6) on: March 30, 2022, through April 1, 2022, for 634598-1A through 634598-3C, 634598-13RQC, and NB22-219/220; on April 4, 2022, through April 7, 2022, for 634598-4A through 634598-7C, 634598-12DQC and NB22-227/228; and on April 12, 2022, through April 14, 2022, for 634598-8A through 634598-11C, and NB22-234/235. PLM slide preparations were made by (b) (6) on: March 31, 2022, for 634598-1A through 634598-3C, and 634598-13RQC; April 6, 2022, for 634598-4A through 634598-7C, and 634598-12DQC; and April 13, 2022, for 634598-8A through 634598-11C. TEM grid preparations were made by: (b) (6) on April 4, 2022, for 634598-1A through 634598-3C, 634598-13RQC, and NB22-219; Ashley Ford on April 7, 2022, for 634598-4A through 634598-7C, 634598-12DQC and NB22-227; and (b) (6) on April 19, 2022, for 6634598-8A through 634598-11C, and NB22-234. Sample preparation consisted of the following steps:

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

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

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

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

PLM Analysis

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

<u>Point Counting</u>
If asbestos was observed on the slide preparations, the amount of asbestos was quantified using point count techniques. Point counting is 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 JEOL JEM-100CX II transmission electron microscopes (TEM) equipped with Thermo Fisher NSS System 7 Energy Dispersive X-Ray Analyzers (EDXA), at magnifications of 19,000x. All TEM scopes are equipped with a Selective Area Electron Diffraction (SAED) setting that allows the operator to view the diffraction pattern of any mineral substance. Twenty (20) grid openings over two (2) grids were examined for each aliquot.

Modifications to the NY ELAP 198.4 Method were:

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

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

Calculations

TEM ASTM D5756 Mass:

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

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

Gravimetric Reduction Percentages:

Organic: ((W1 – W2) * 100/W1
Acid Soluble: ((W2 – W3) * 100/W1
Other* Percent: ((W3/W1) * 100) – Calculated Asbestos %
*Other is defined as the non-asbestos, inorganic, acid insoluble portion of the sample

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

Asbestos Percent Calculation:

TEM

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

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

Where: EFA: Effective filter area
MA: Mass of asbestos
RW: Weight of residue

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

VF: Volume filtered
IW: Initial weight of the sample
AA: Area analyzed
RJ: Weight of residue placed into the jar

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

Limit of Detection and Quantification

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

Discussion and Interpretation of Analytical Findings

634598-1A, 1B, 1C/Client Sample: 03022022-1

PLM

All three aliquots of sample 03022022-1 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-1A	No Asbestos Detected
634598-1B	No Asbestos Detected
634598-1C	No Asbestos Detected

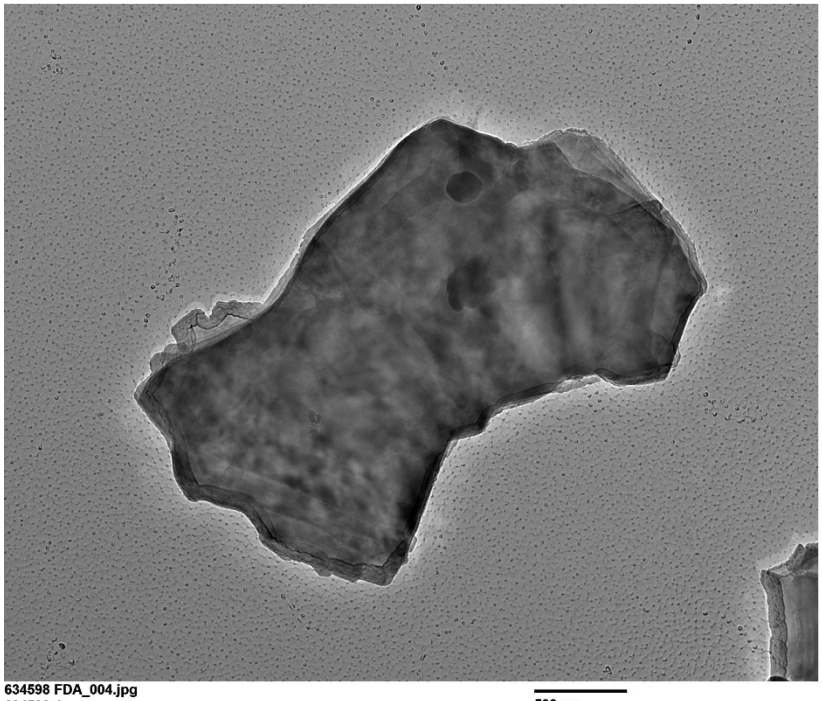
TEM

(b) (6) analyzed aliquots 1A, 1B, and 1C on April 5, 2022. The primary particle observed was talc; titanium particles were also observed along with mica particles, particles containing silicon, aluminum, magnesium and iron, talc ribbons/elongated talc particles, and elongated mica 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.

634598-1A	No Asbestos Detected
634598-1B	No Asbestos Detected
634598-1C	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.

634598-1A, Talc Particle



634598 FDA_004.jpg
634598-1a
Talc Particle
Cal: 0.001775 µm/pix
13:18 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

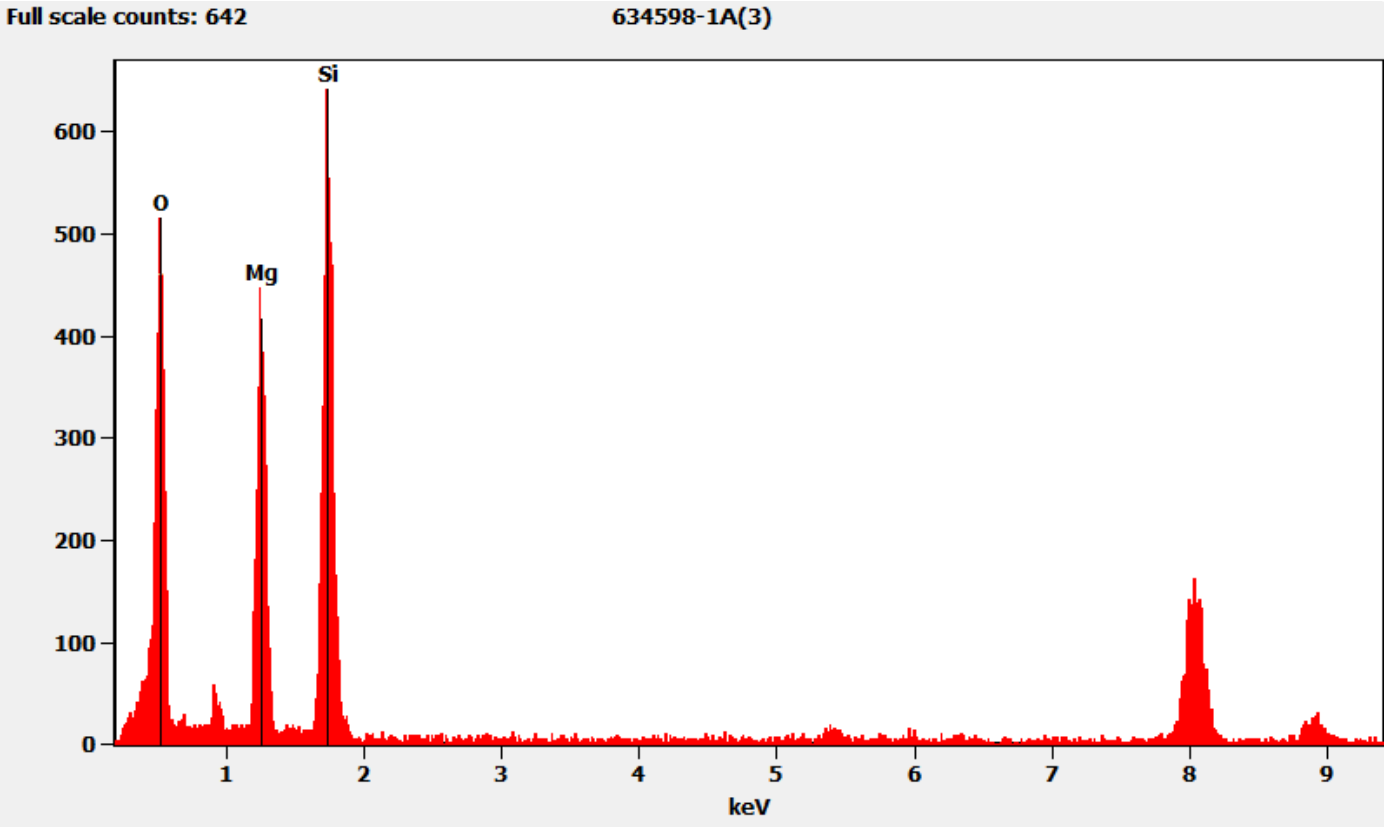
500 nm
HV=100kV
Direct Mag: 5800 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

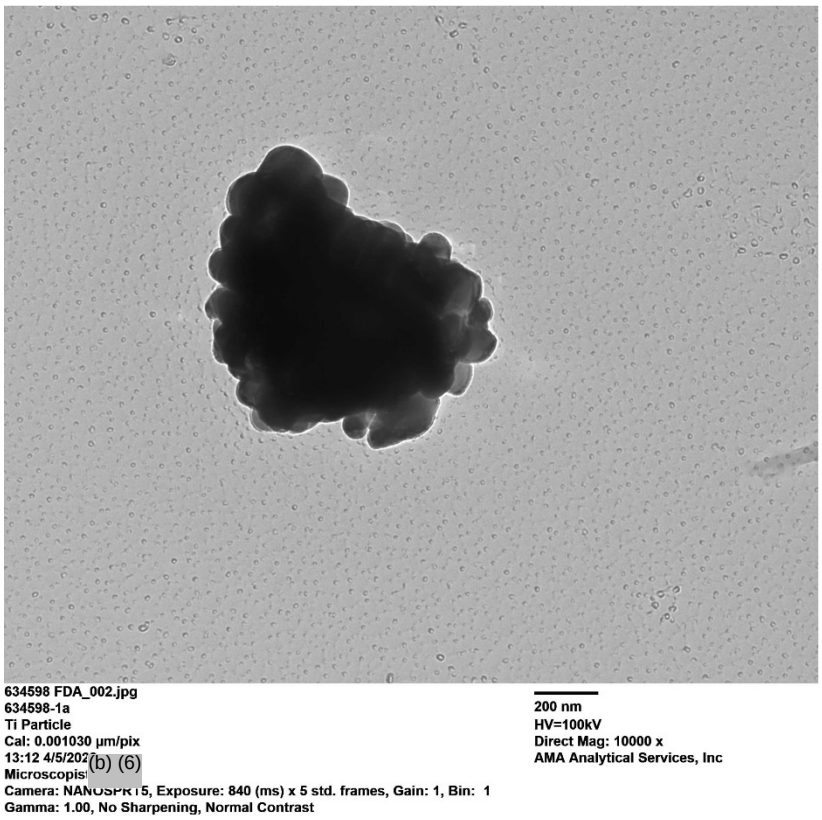
634598 FDA_003.jpg
634598-1a
Talc Particle
13:17 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-1A, Titanium Particle

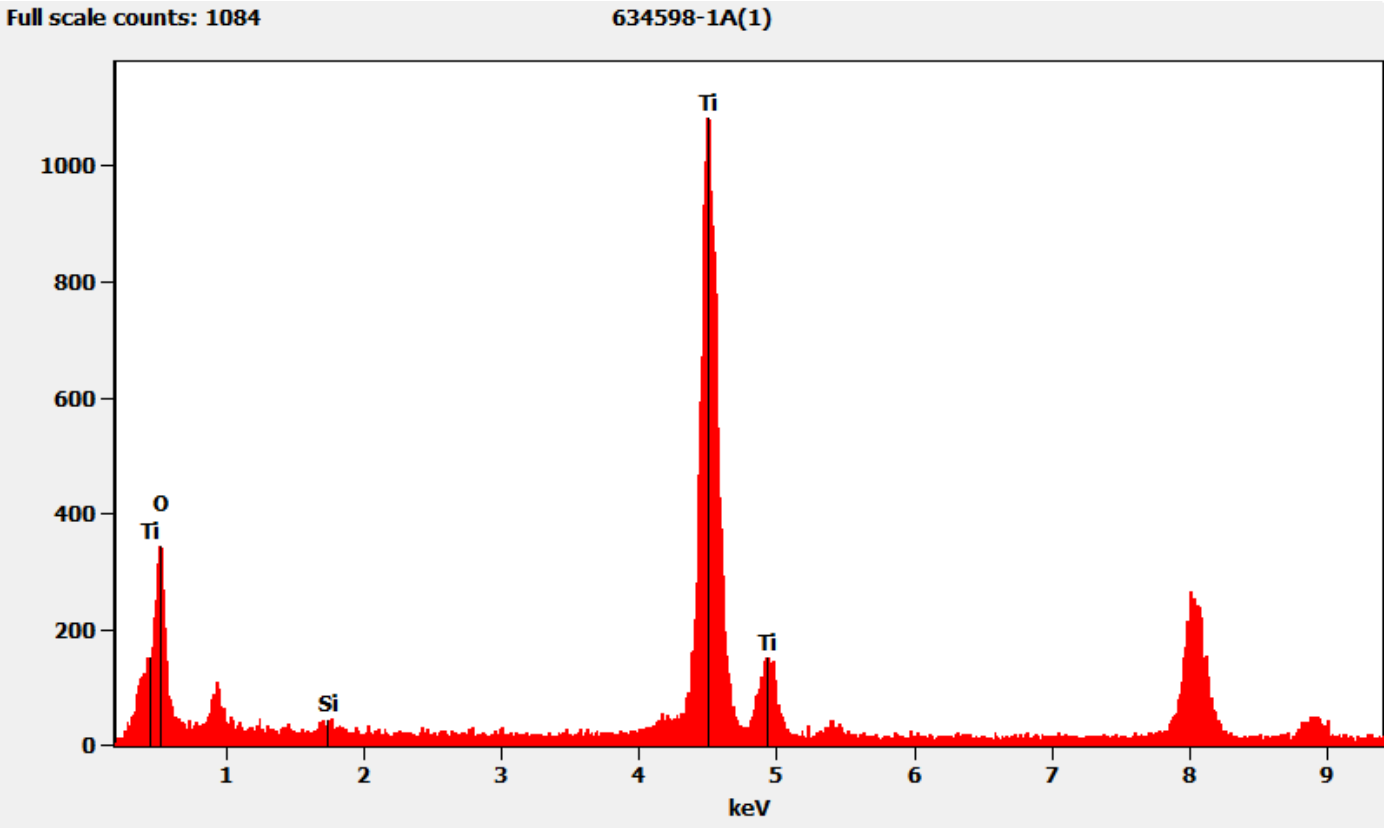


Diffraction Pattern from the Titanium Particle Pictured Above

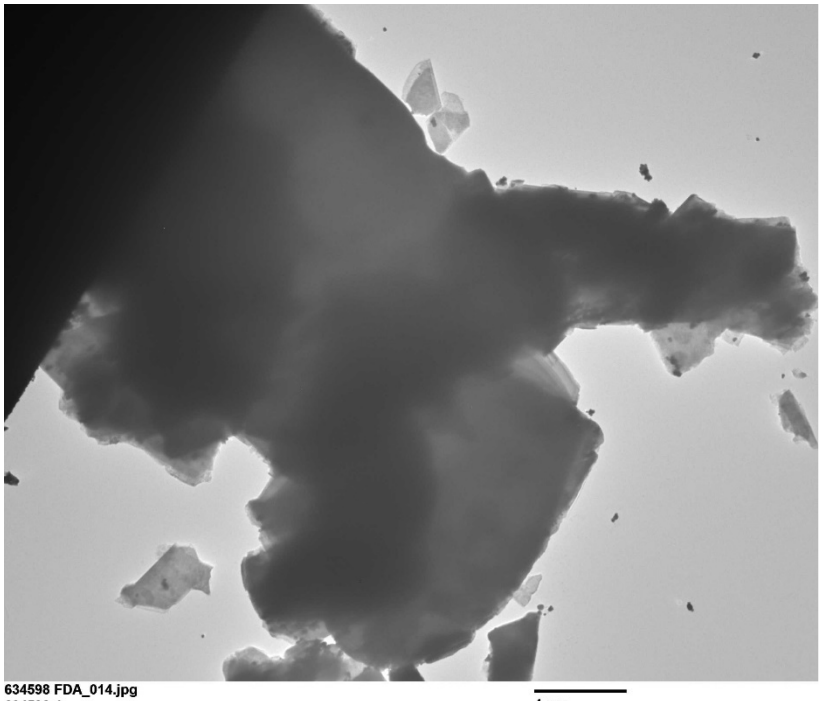
634598 FDA_001.jpg
634598-1a
Ti Particle
13:11 4/5/2022
Microscopist (b) (6)
Camera: NANO[illegible]T5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Titanium Particle Pictured Above



634598-1B, Mica Particle



634598 FDA_014.jpg
634598-1a
Mica Particle
Cal: 0.014300 µm/pix
14:22 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRI5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

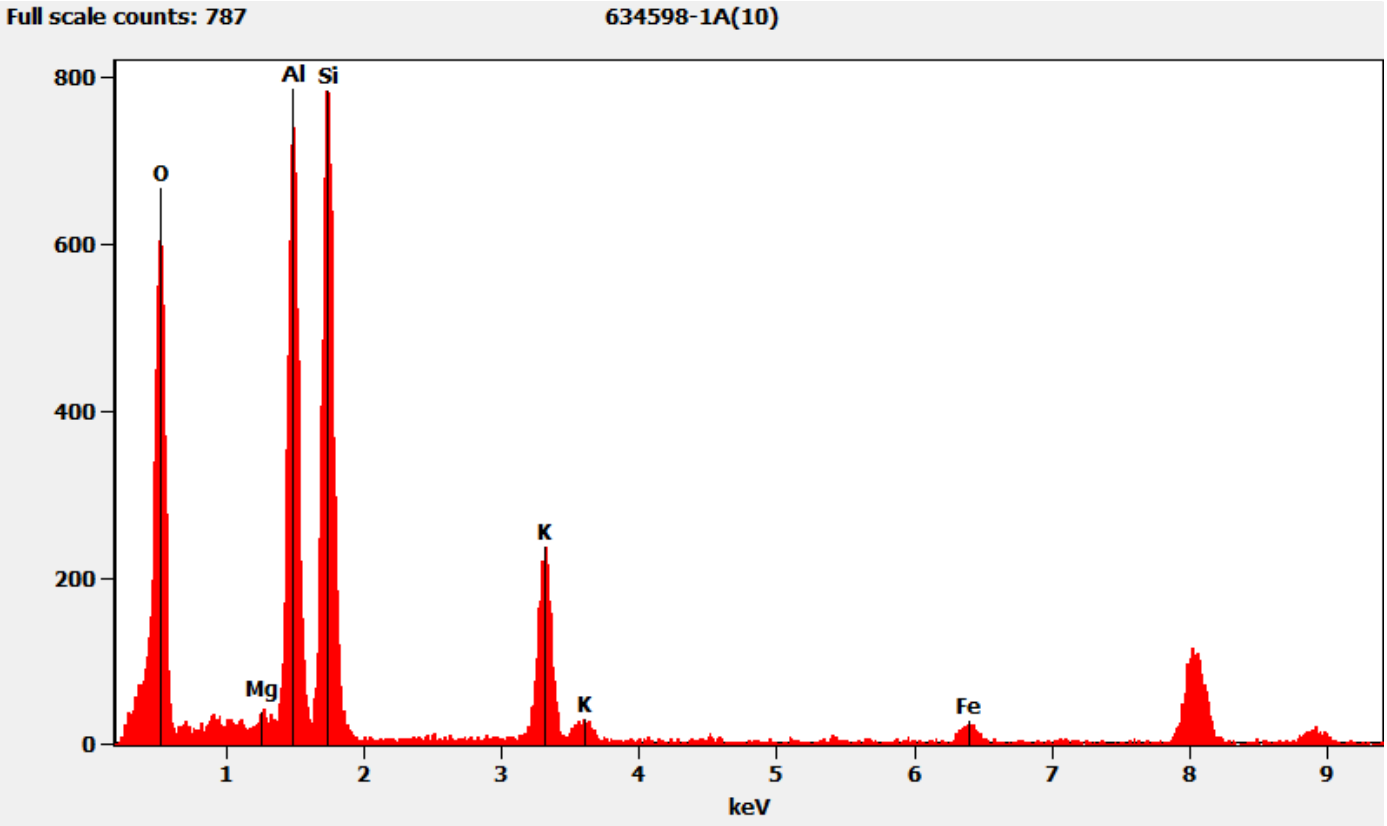
4 µm
HV=100kV
Direct Mag: 720 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

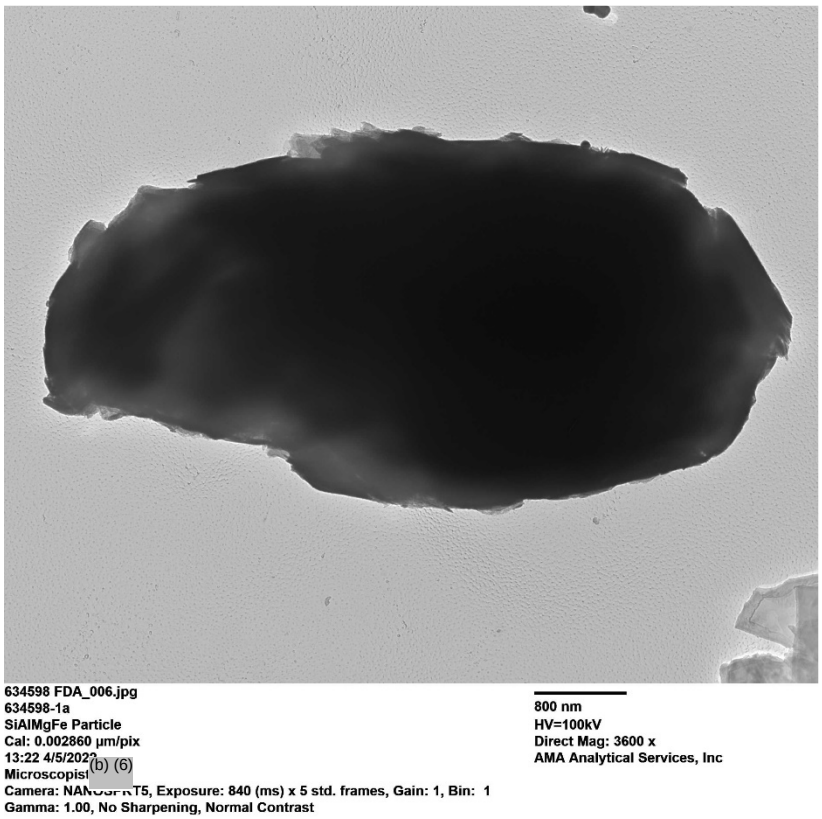
634598 FDA_013.jpg
634598-1a
Mica Particle
14:21 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRI5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle Pictured Above



634598-1A, Particle Containing Silicon, Aluminum, Magnesium, and Iron

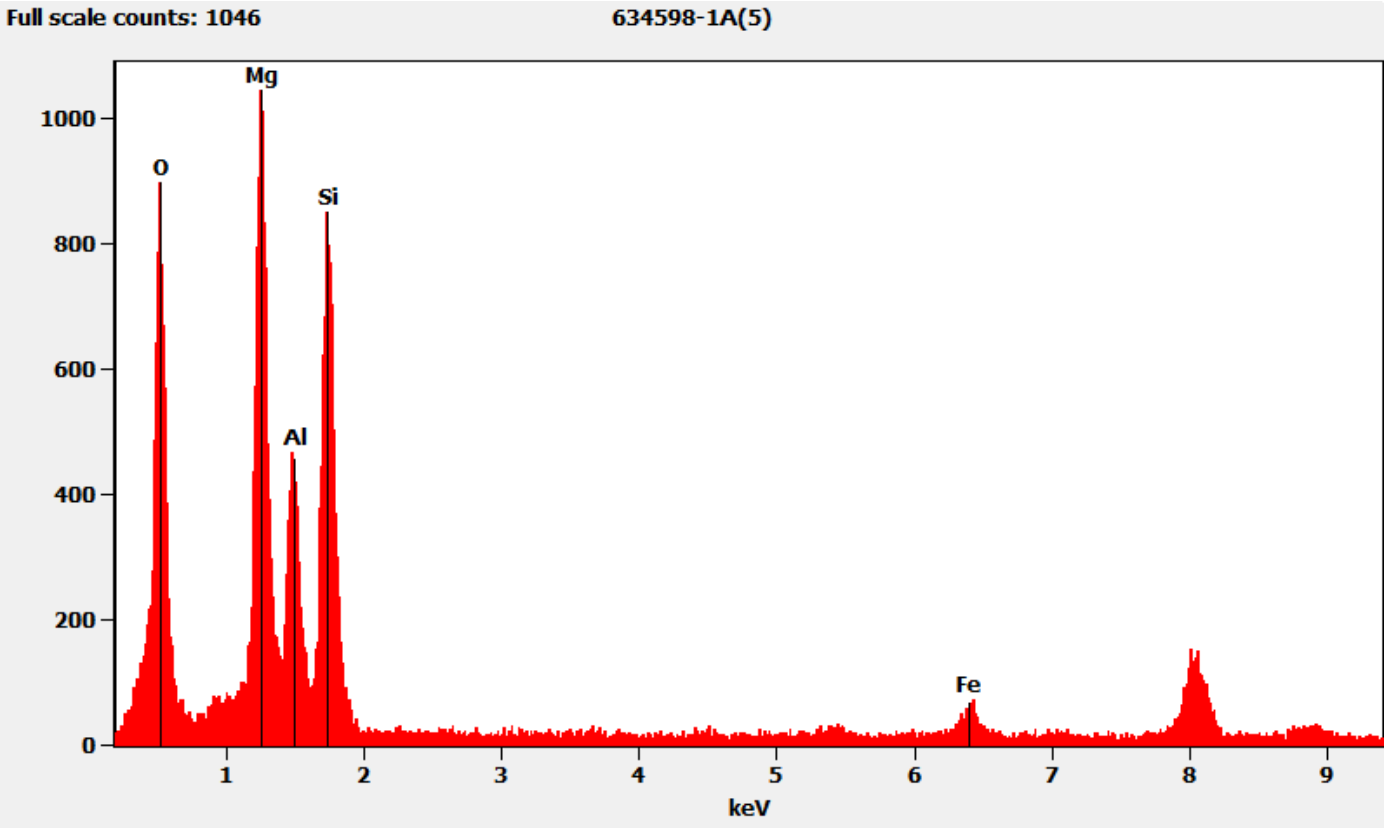


Diffraction Pattern from the Particle Containing Silicon, Aluminum, Magnesium, and Iron Pictured Above

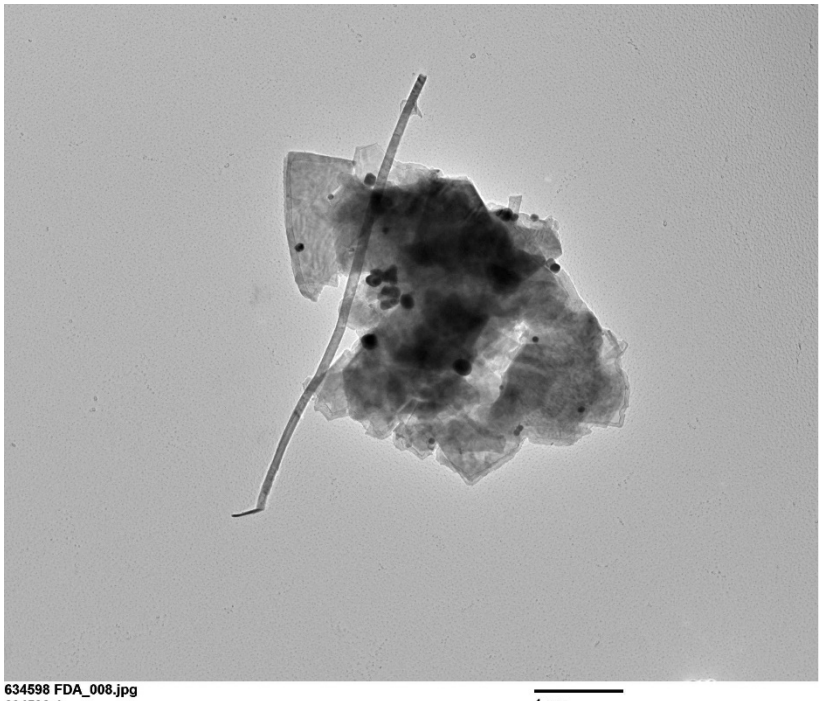
634598 FDA_005.jpg
634598-1a
SiAlMgFe Particle
13:21 4/5/2022 (b) (6)
Microscopist:
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

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



634598-1A, Talc Ribbon



634598 FDA_008.jpg
634598-1a
Talc Ribbon
Cal: 0.003702 µm/pix
13:31 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

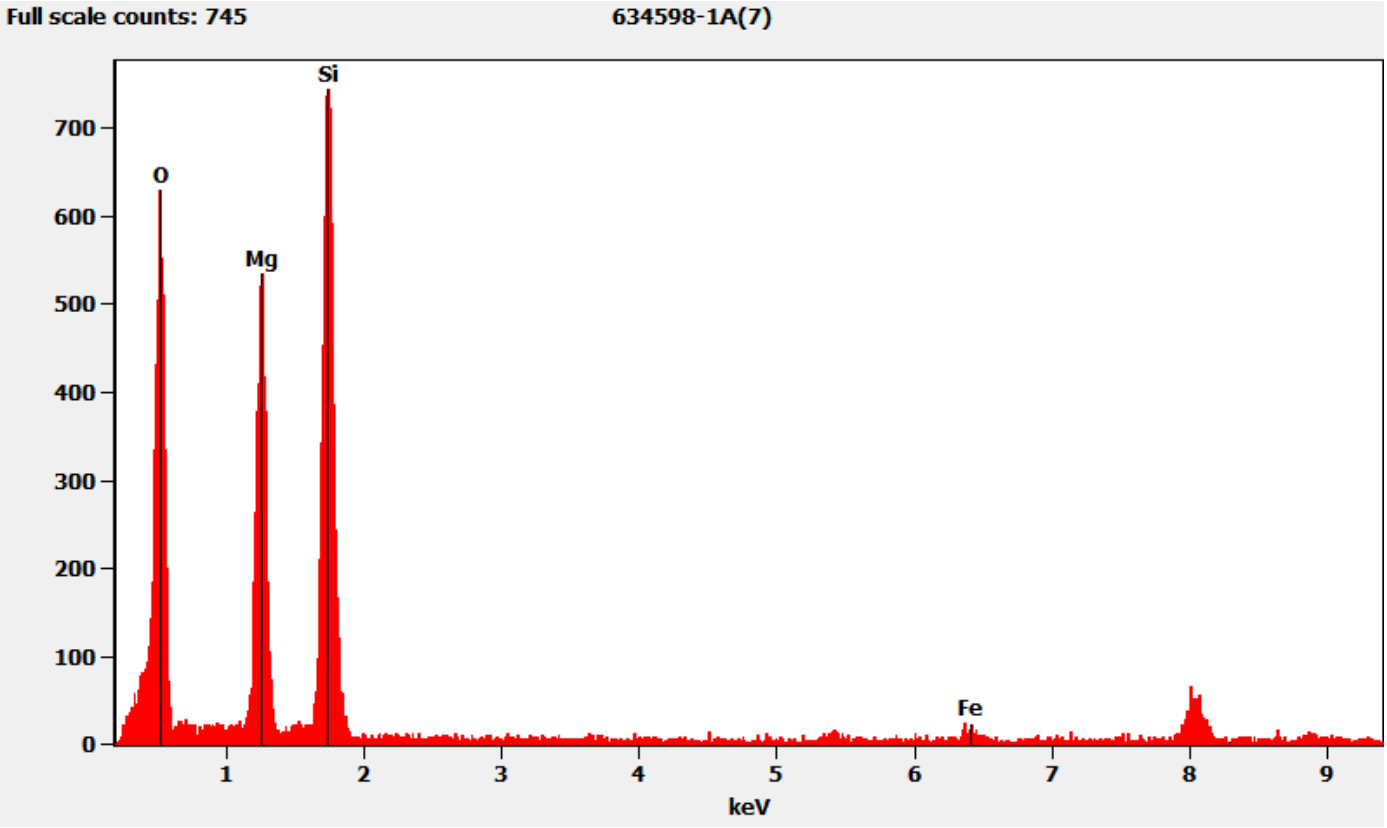
1 µm
HV=100kV
Direct Mag: 2900 x
AMA Analytical Services, Inc

Diffraction Pattern from the Talc Ribbon Pictured Above

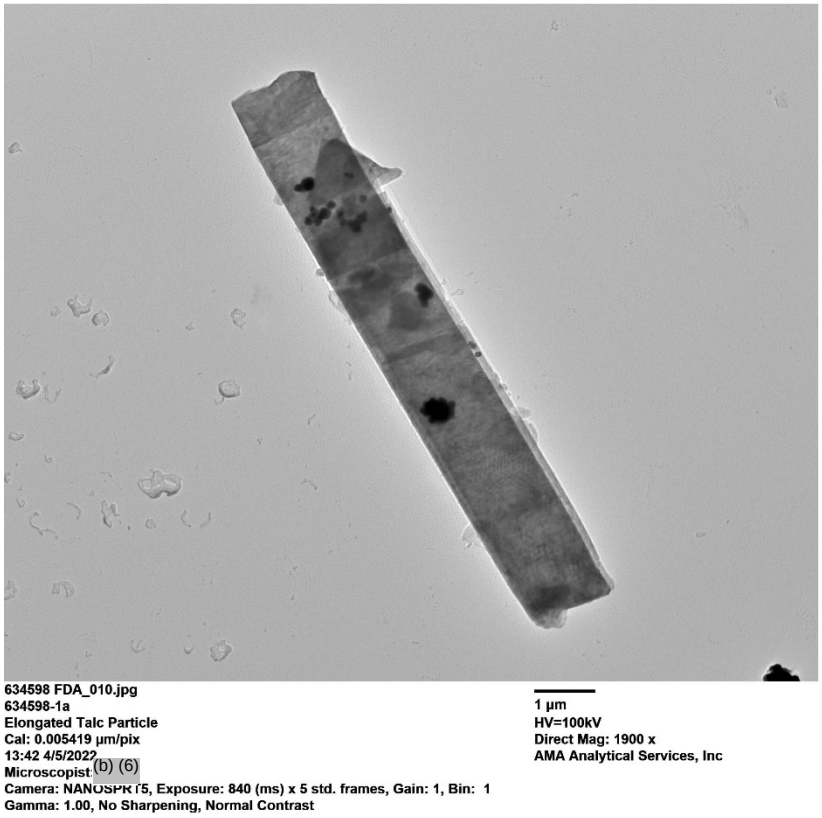
634598 FDA_007.jpg
634598-1a
Talc Ribbon
13:31 4/5/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-1A, Elongated Talc Particle

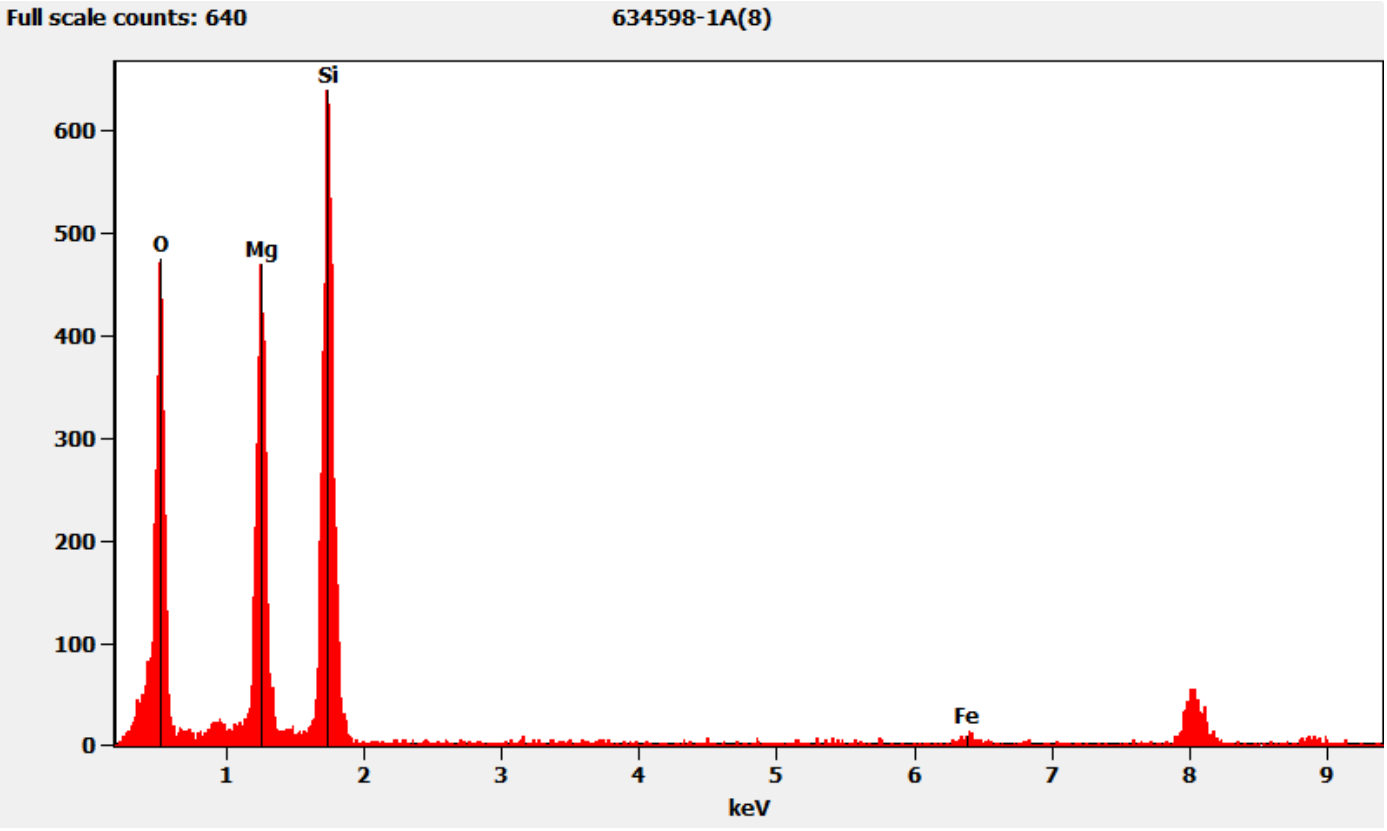


Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

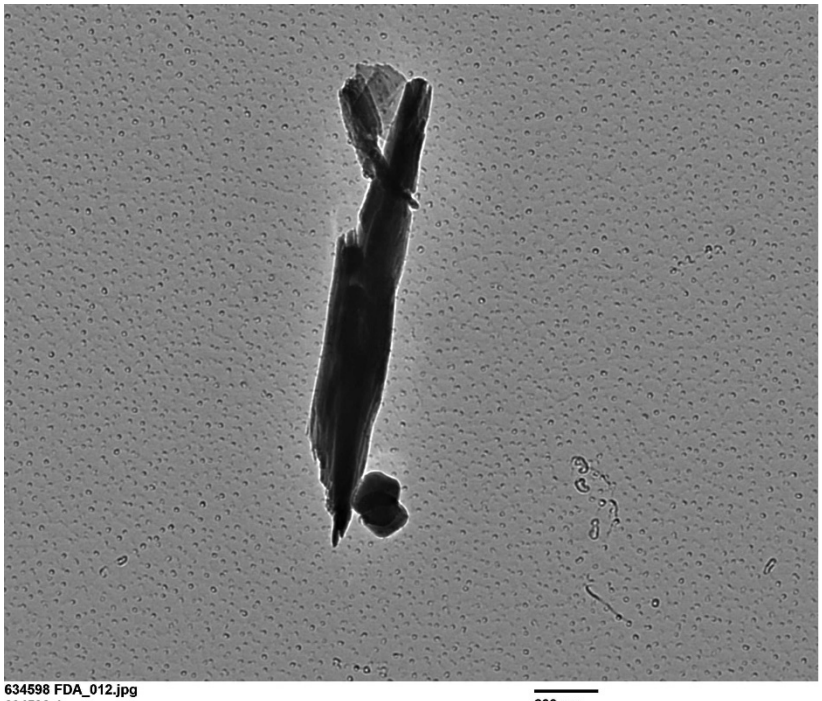
634598 FDA_009.jpg
634598-1a
Elongated Talc Particle
13:41 4/5/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-1A, Elongated Mica Particle



634598 FDA_012.jpg
634598-1a
Elongated Mica Particle
Cal: 0.001030 µm/pix
14:15 4/5/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

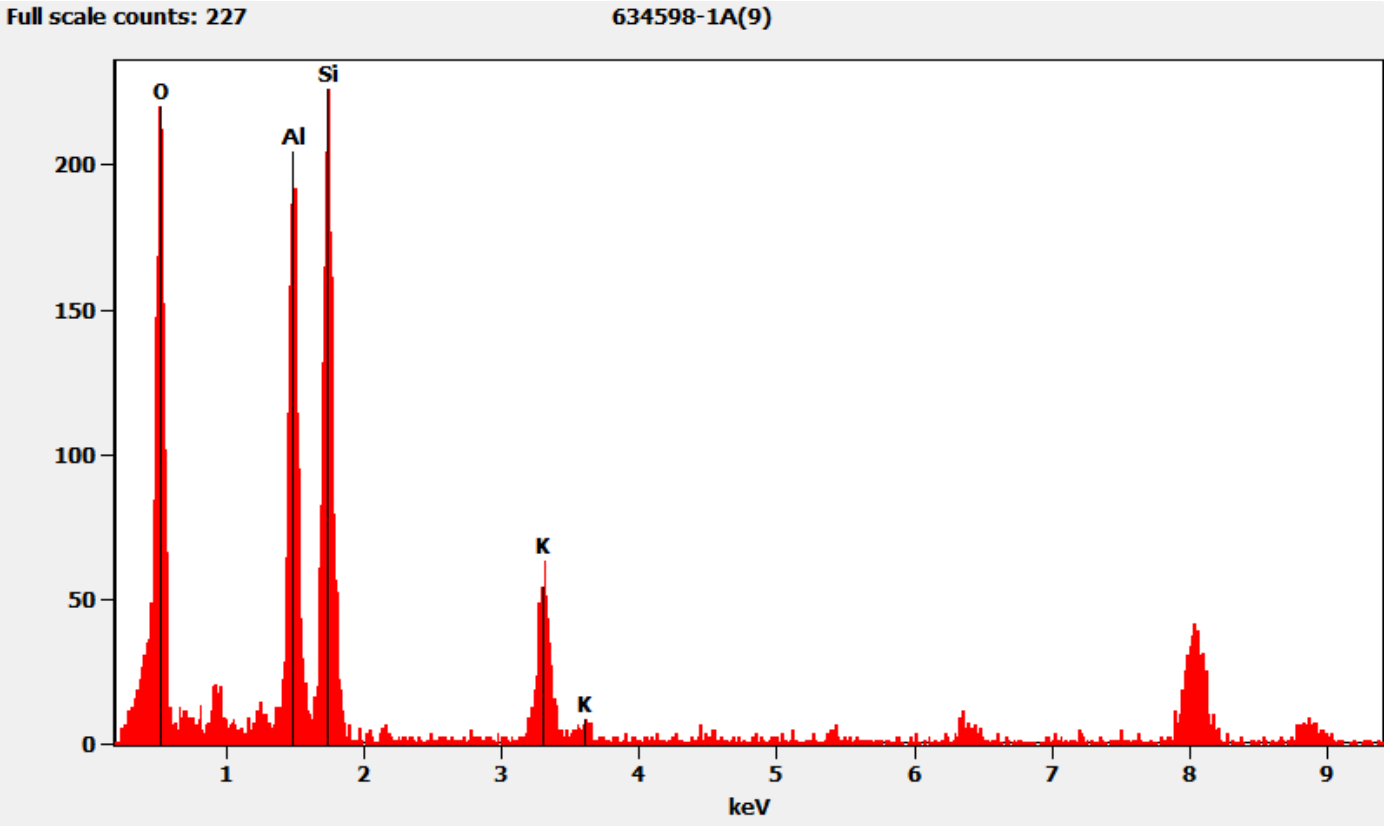
200 nm
HV=100kV
Direct Mag: 10000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Elongated Mica Particle Pictured Above

634598 FDA_011.jpg
634598-1a
Elongated Mica Particle
14:14 4/5/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Mica Particle Pictured Above



634598-2A, 2B, 2C/Client Sample: 03022022-2

PLM

All three aliquots of sample 03022022-2 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-2A	No Asbestos Detected
634598-2B	No Asbestos Detected
634598-2C	No Asbestos Detected

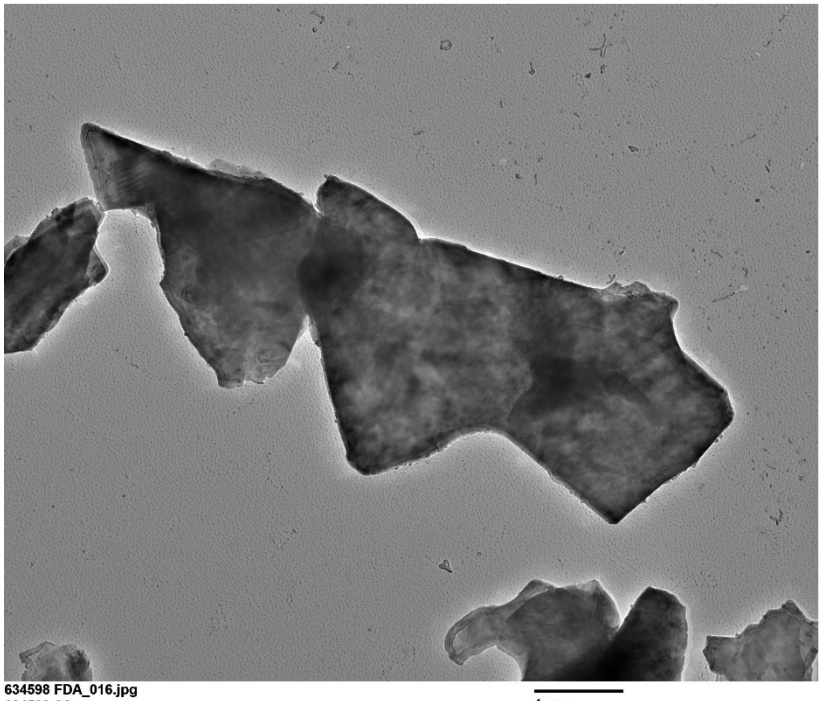
TEM

(b) (6) analyzed aliquots 2A and 2C on April 7, 2022. The primary particle observed was talc; silicon particles were also observed along with particles containing phosphorus and calcium, particles containing barium and sulfur, iron particles, and talc ribbons. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-2A	No Asbestos Detected
634598-2B	No Asbestos Detected
634598-2C	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.

634598-2A, Talc Particle



634598 FDA_016.jpg
634598-2A
Talc Particle
Cal: 0.003702 µm/pix
11:00 4/7/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

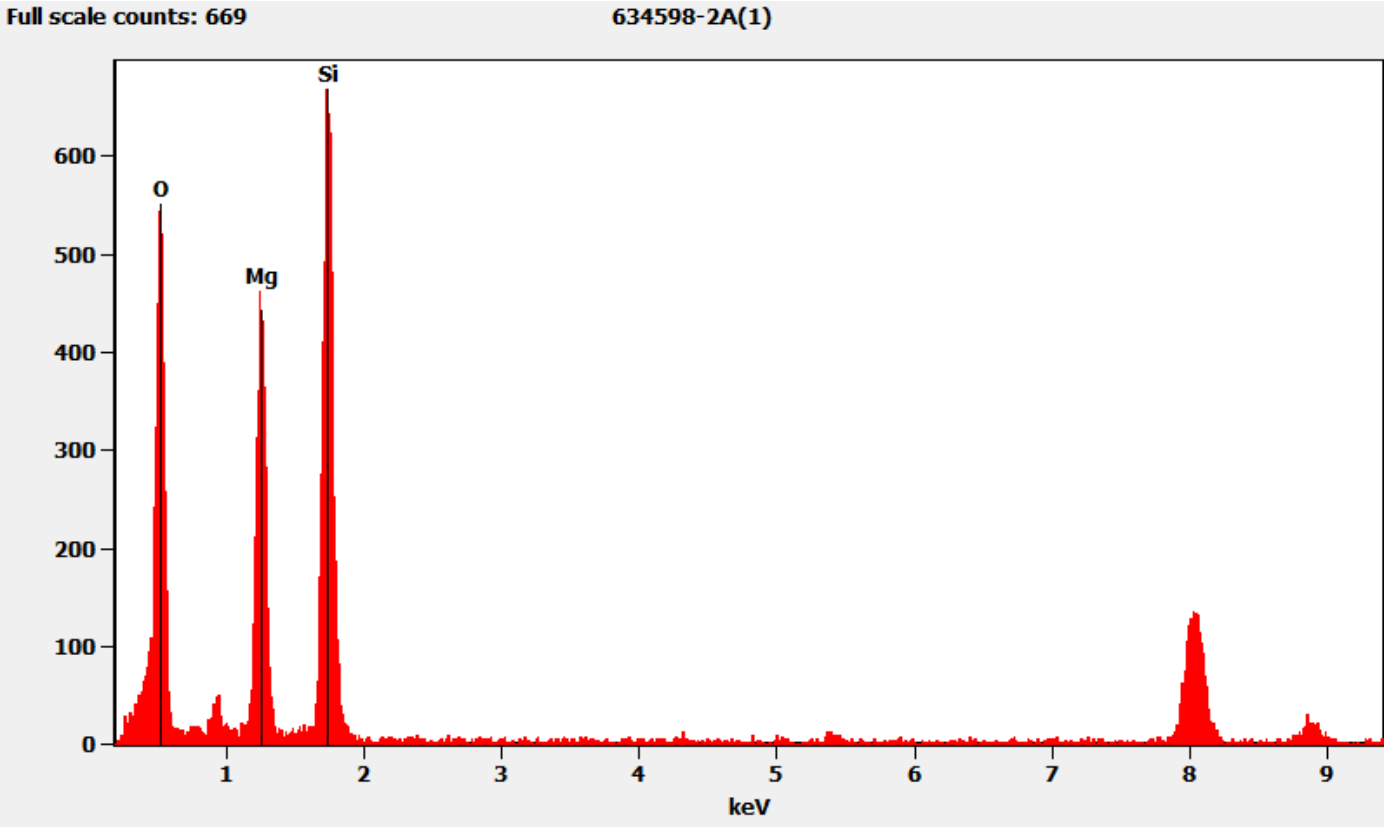
1 µm
HV=100kV
Direct Mag: 2900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

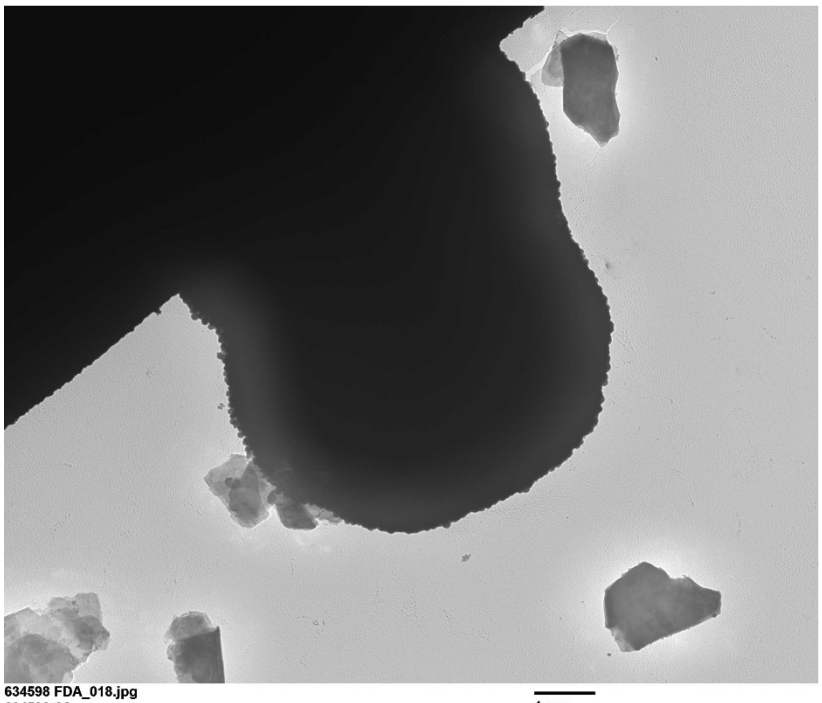
634598 FDA_015.jpg
634598-2A
Talc Particle
10:57 4/7/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-2A, Silicon Particle

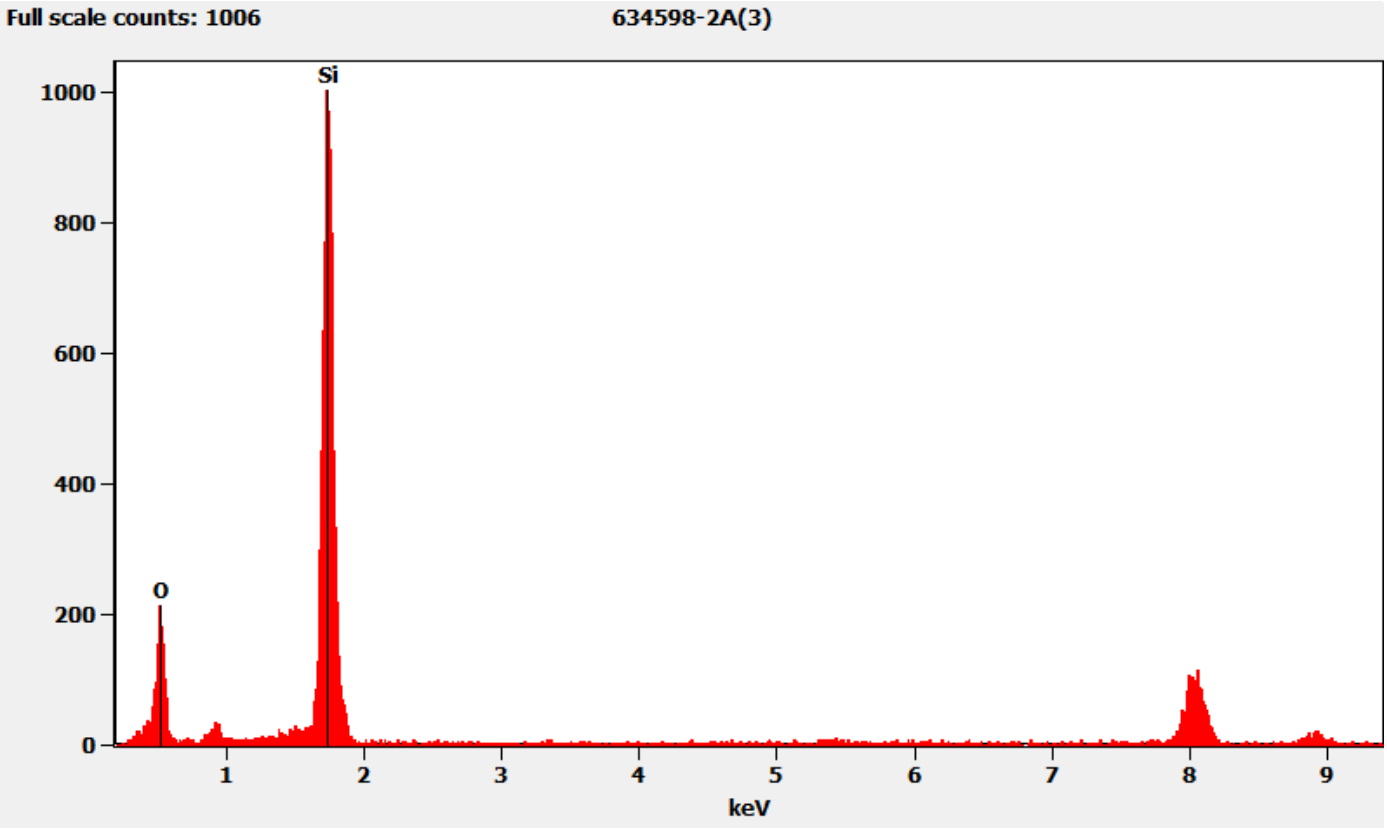


Diffraction Pattern from the Silicon Particle Pictured Above

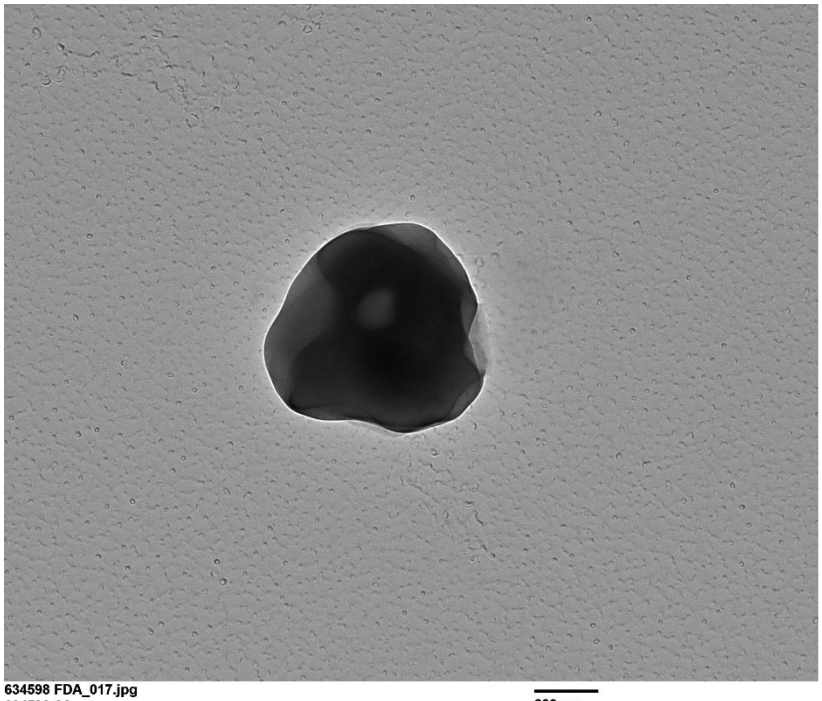
634598 FDA_019.jpg
634598-2A
Fe Particle
11:15 4/7/2022
Microscopis (b) (6)
Camera: NAI[illegible], Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

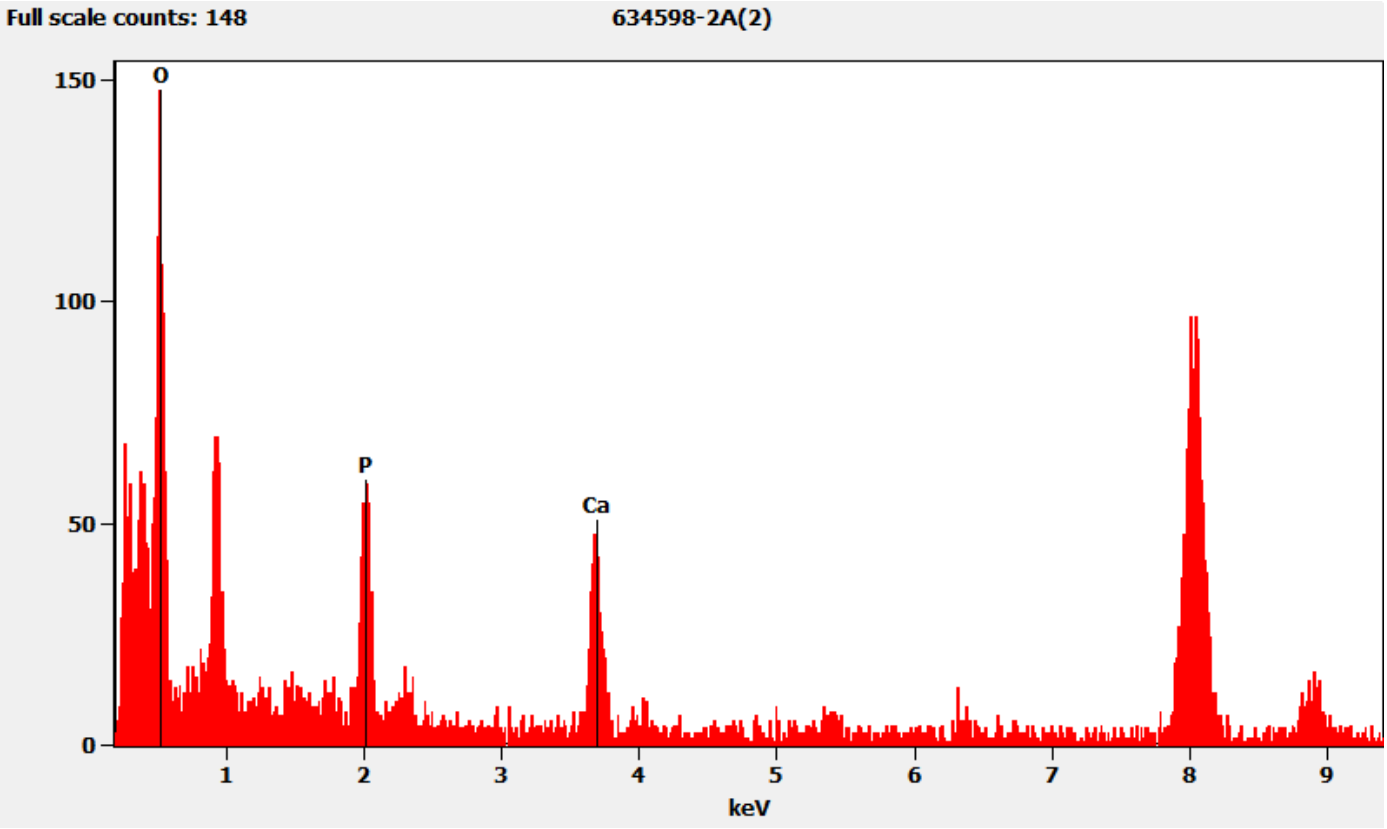
Chemistry from the Silicon Particle Pictured Above



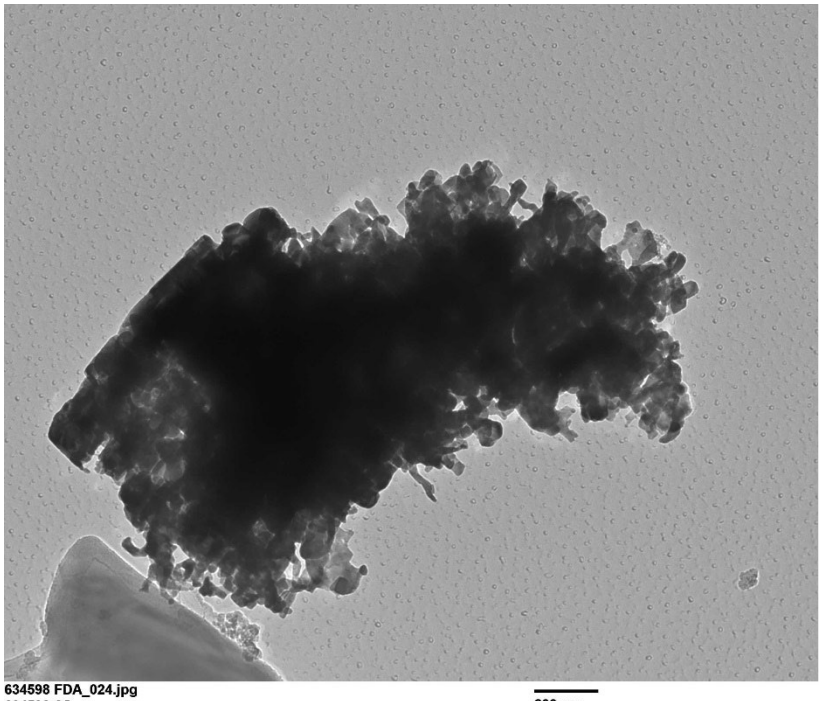
634598-2A, Particle Containing Phosphorus and Calcium



Chemistry from the Particle Containing Phosphorus and Calcium Pictured Above



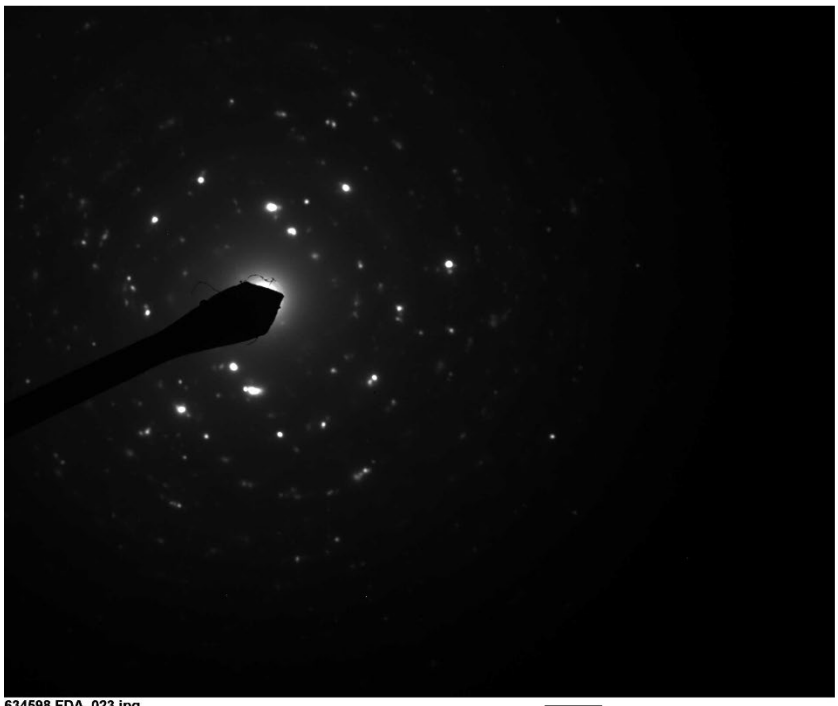
634598-2C, Particle Containing Barium and Sulfur



634598 FDA_024.jpg
634598-2C
BaS Particle
Cal: 0.001030 µm/pix
12:40 4/7/2022
Microscopist (b) (6)
Camera: NANOSPR15, 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
AMA Analytical Services, Inc

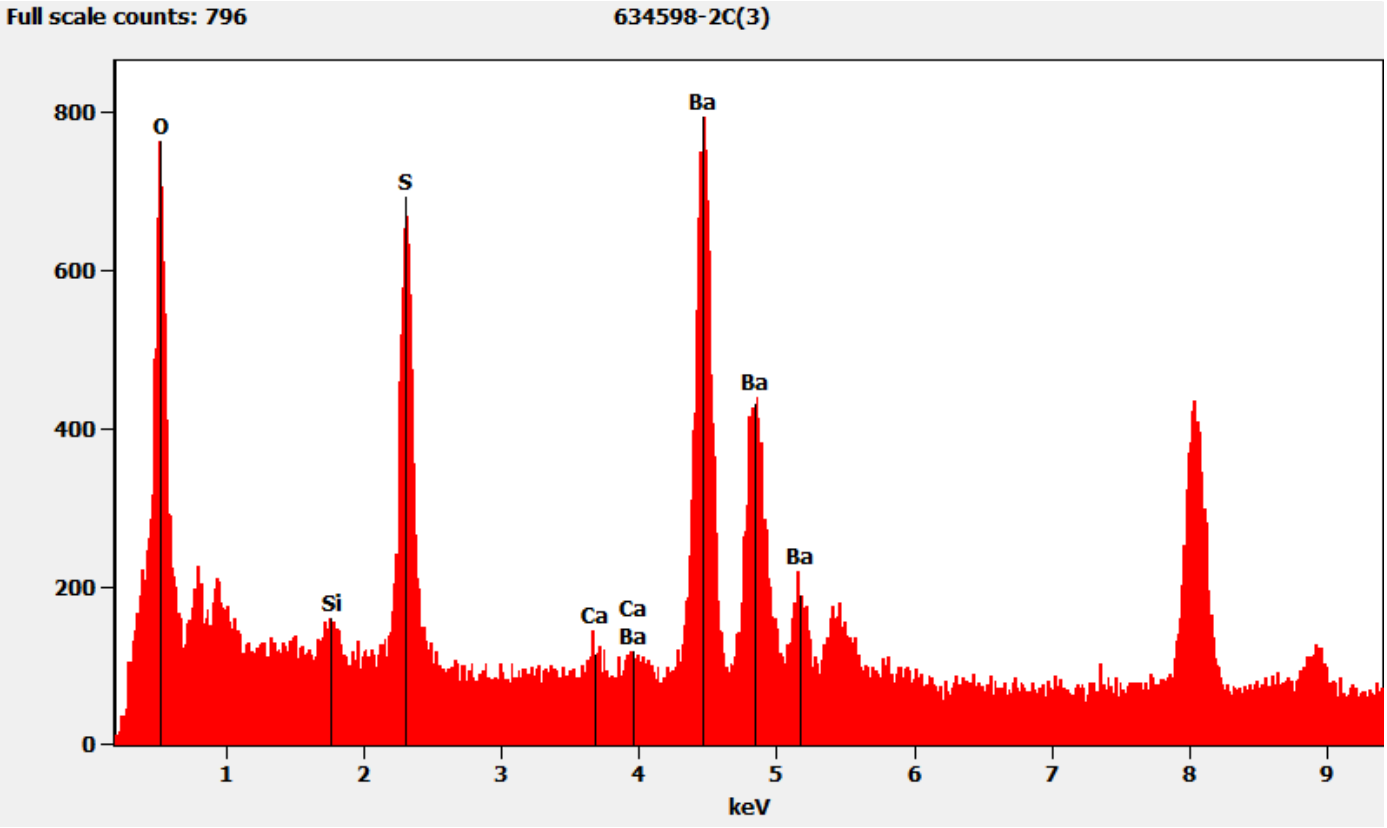
Diffraction Pattern from the Particle Containing Barium and Sulfur Pictured Above



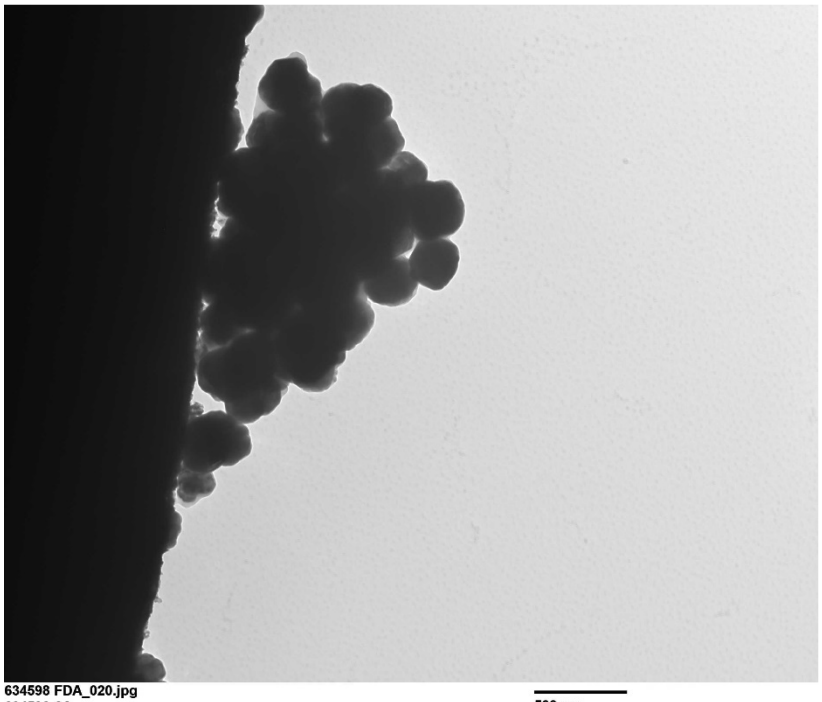
634598 FDA_023.jpg
634598-2C
BaS Particle
12:39 4/7/2022
Microscopist (b) (6)
Camera: NANOSPR15, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Particle containing Barium and Sulfur Pictured Above



634598-2A, Iron Particle



634598 FDA_020.jpg
634598-2A
Fe Particle
Cal: 0.001775 µm/pix
11:16 4/7/2022
Microscopist(b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

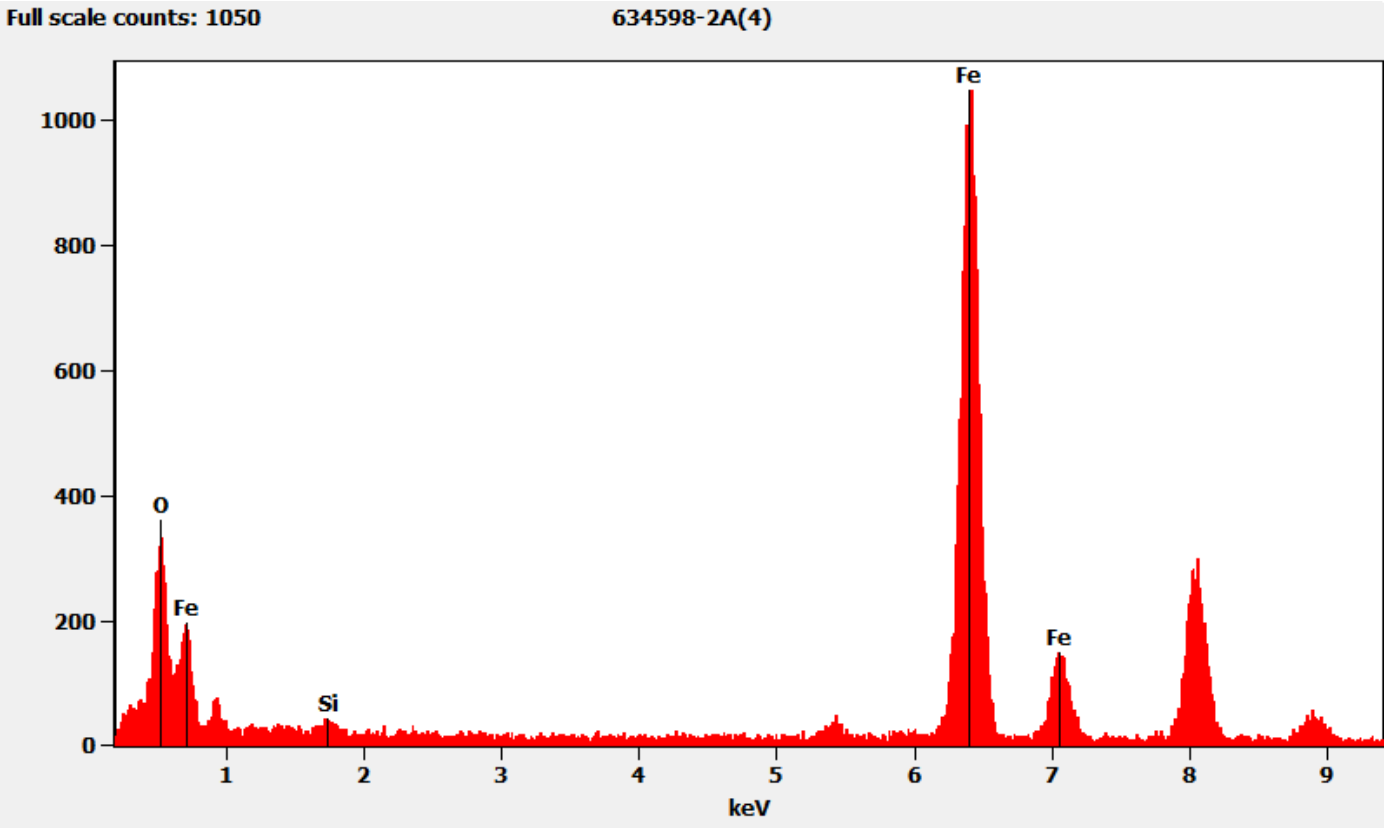
500 nm
HV=100kV
Direct Mag: 5800 x
AMA Analytical Services, Inc

Diffraction Pattern from the Iron Particle Pictured Above

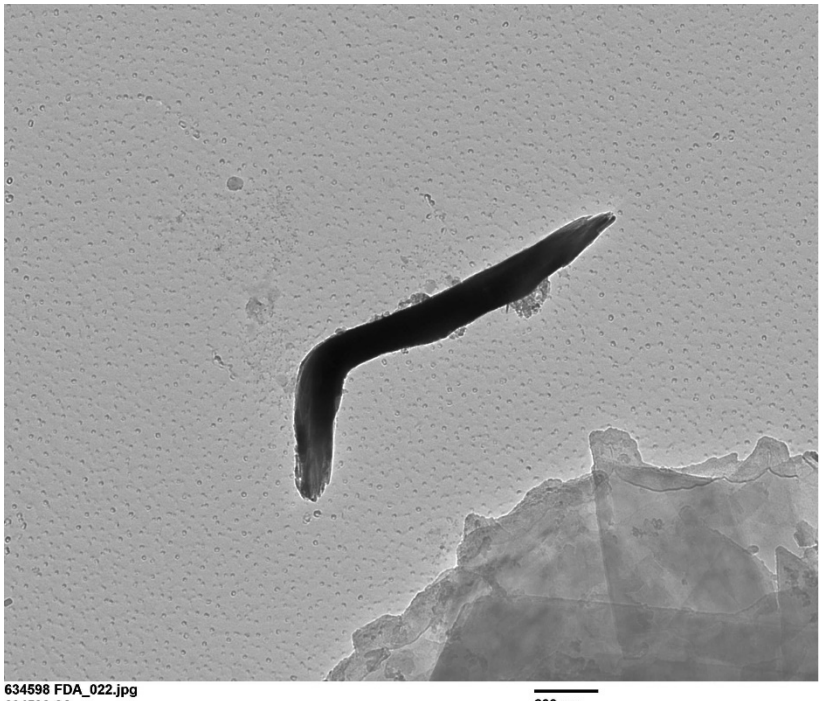
634598 FDA_019.jpg
634598-2A
Fe Particle
11:15 4/7/2022
Microscopis (b) (6)
Camera: NAI[illegible], Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Iron Particle Pictured Above



634598-2A, Talc Ribbon



634598 FDA_022.jpg
634598-2A
Talc Ribbon
Cal: 0.001030 µm/pix
11:20 4/7/2022
Microscopist (b) (6)
Camera: NANO[illegible]RT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

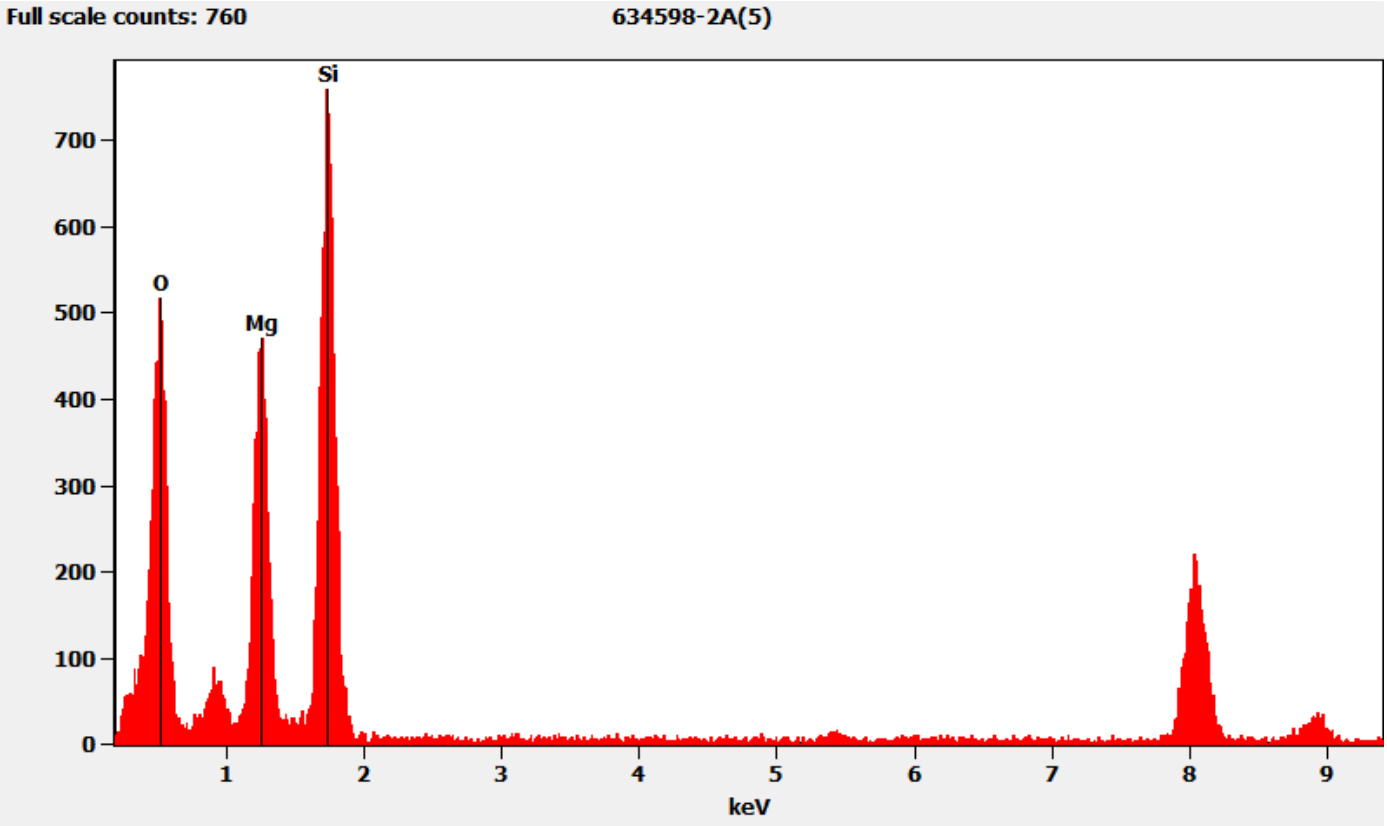
200 nm
HV=100kV
Direct Mag: 10000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Talc Ribbon Pictured Above

634598 FDA_021.jpg
634598-2A
Talc Ribbon
11:19 4/7/2022
Microscopist (b) (6)
Camera: NANO[illegible]T5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-3A, 3B, 3C/Client Sample: 03022022-3

PLM

All three aliquots of sample 03022022-3 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-3A	No Asbestos Detected
634598-3B	No Asbestos Detected
634598-3C	No Asbestos Detected

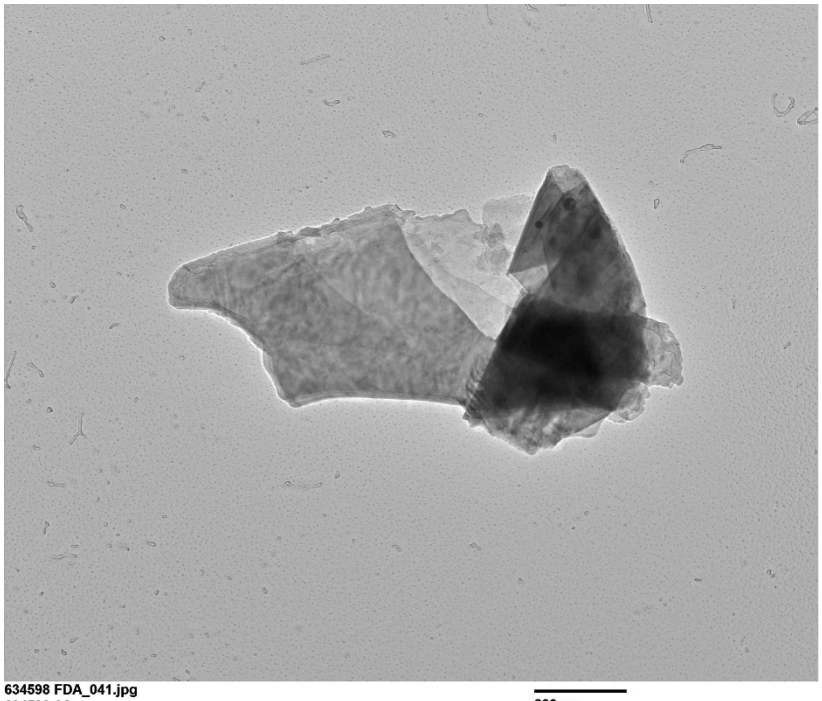
TEM

(b) (6) analyzed aliquot 3A on April 11, 2022. (b) (6) analyzed aliquots 3B and 3C on April 8, 2022. The primary particles observed were talc and titanium; elongated talc particles were also observed along with talc ribbons. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-3A	No Asbestos Detected
634598-3B	No Asbestos Detected
634598-3C	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.

634598-3A, Talc Particle



634598 FDA_041.jpg
634598-3A
Talc Particle
Cal: 0.002860 µm/pix
17:39 4/11/20(b) (6)
Microscopist
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

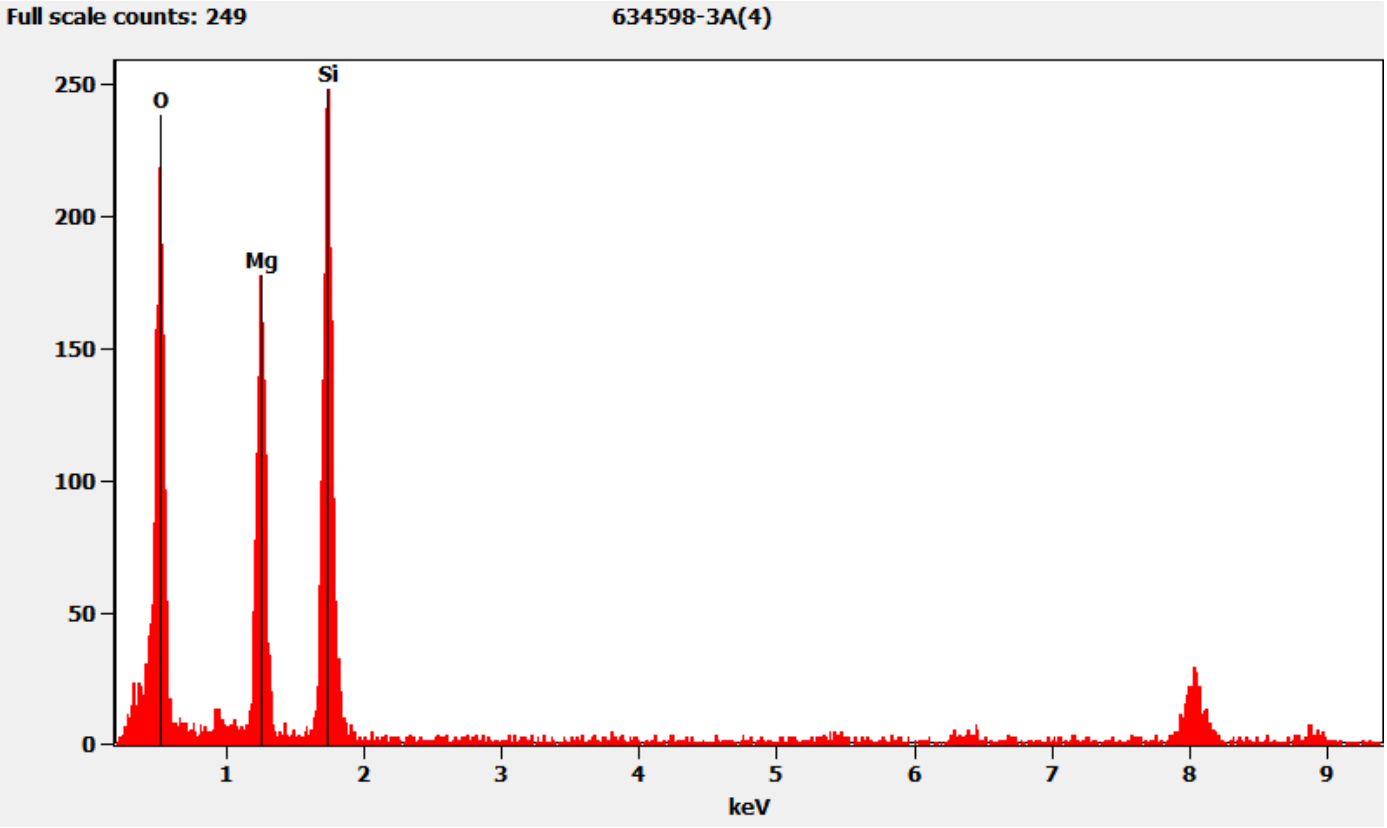
800 nm
HV=100kV
Direct Mag: 3600 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

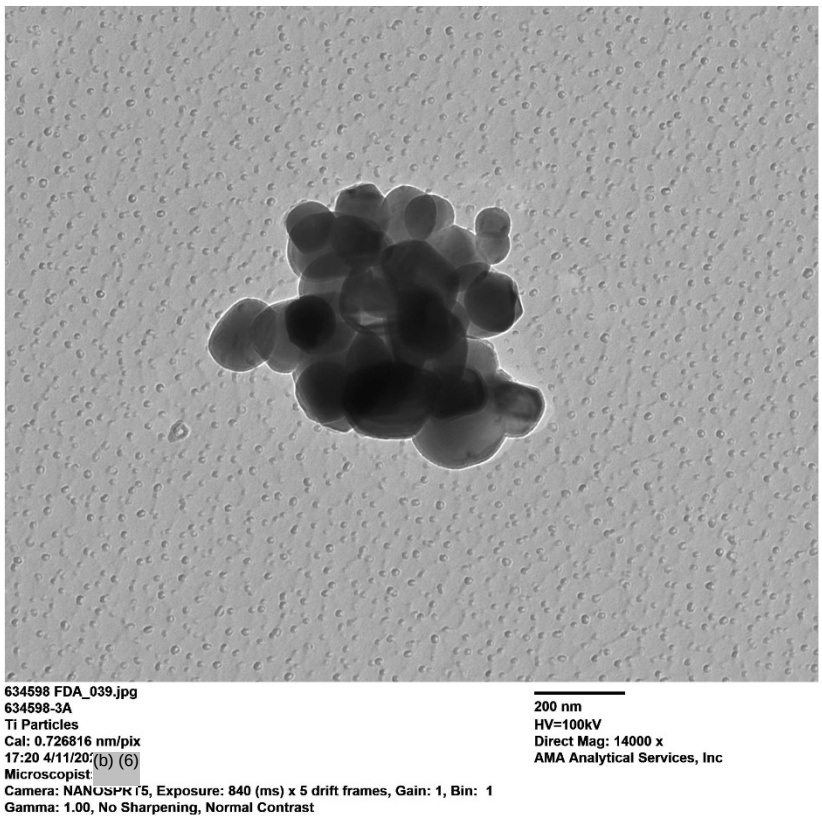
634598 FDA_040.jpg
634598-3A
Talc Particle
17:35 4/11/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-3A, Titanium Particle

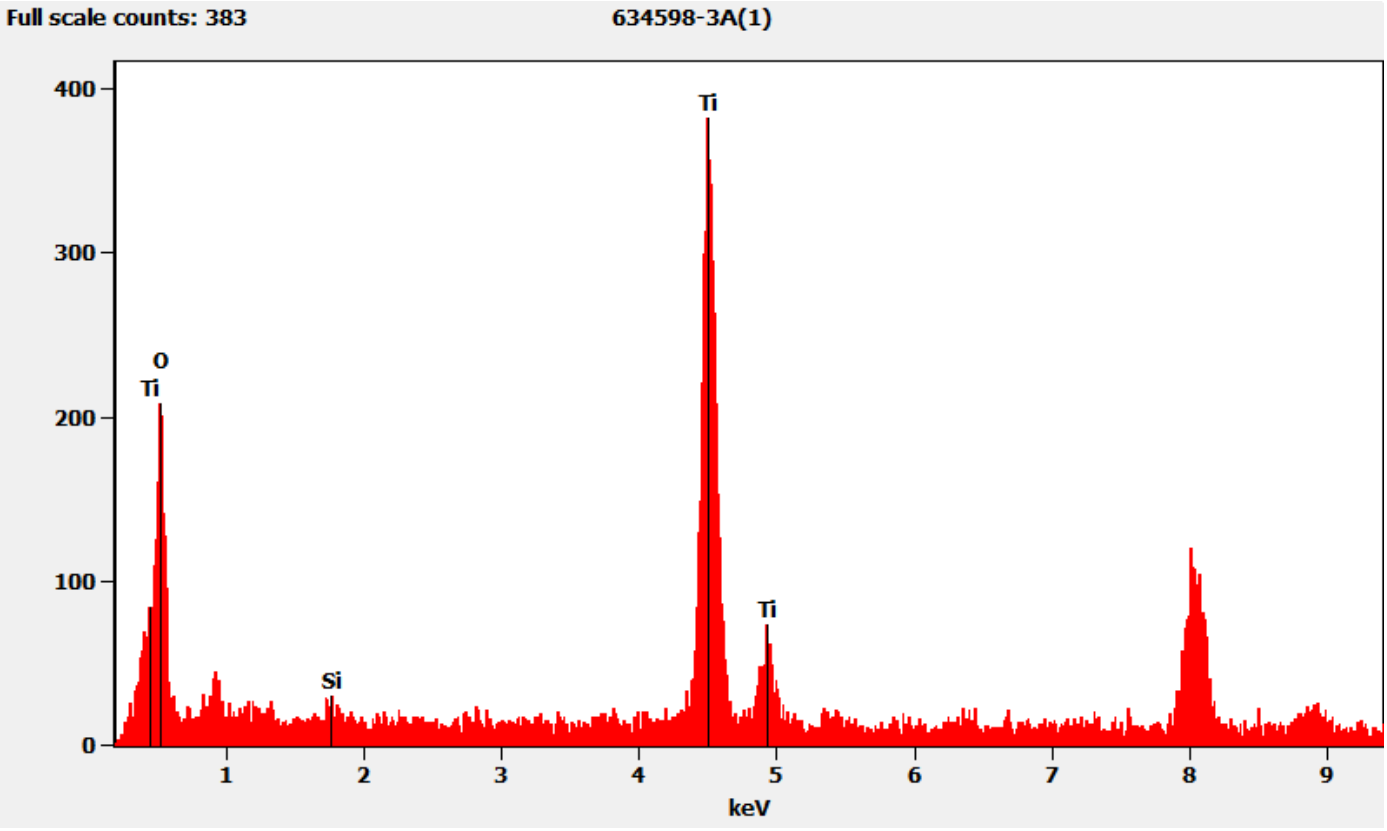


Diffraction Pattern from the Titanium Particle Pictured Above

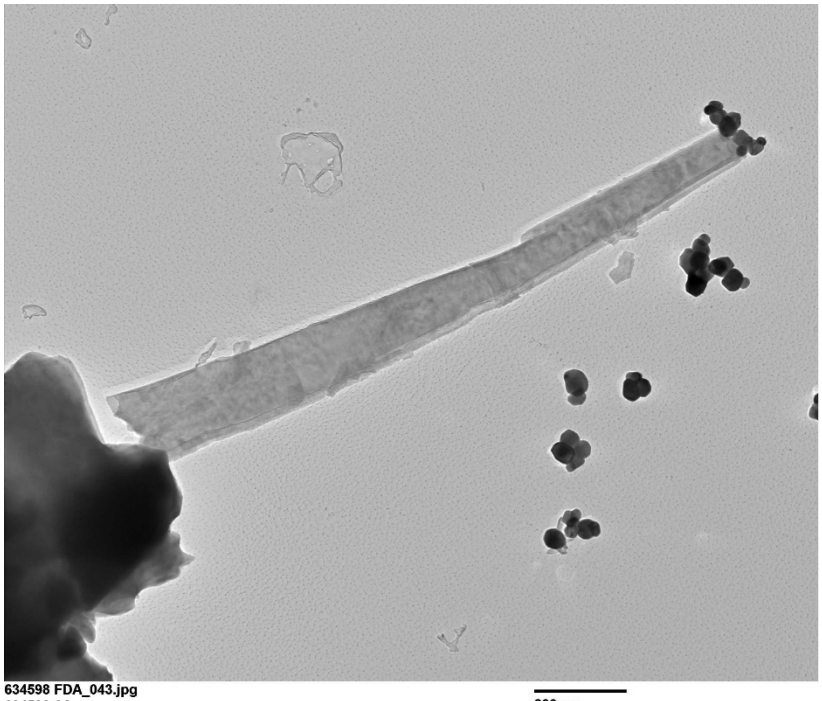
634598 FDA_038.jpg
634598-3A
Ti Particles
17:19 4/11/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Titanium Particle Pictured Above



634598-3A, Elongated Talc Particle



634598 FDA_043.jpg
634598-3A
Talc Fiber
Cal: 0.002860 µm/pix
17:47 4/11/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

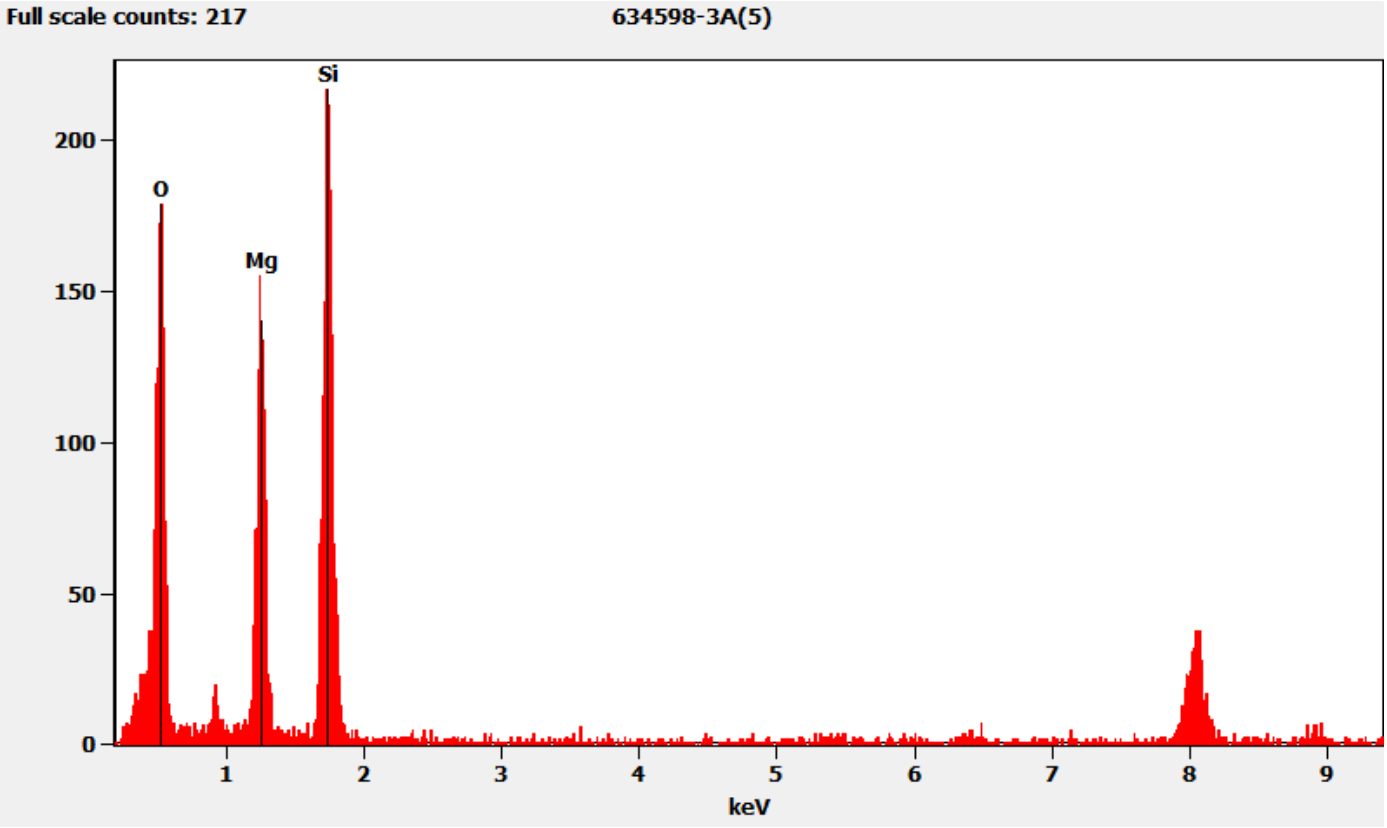
800 nm
HV=100kV
Direct Mag: 3600 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

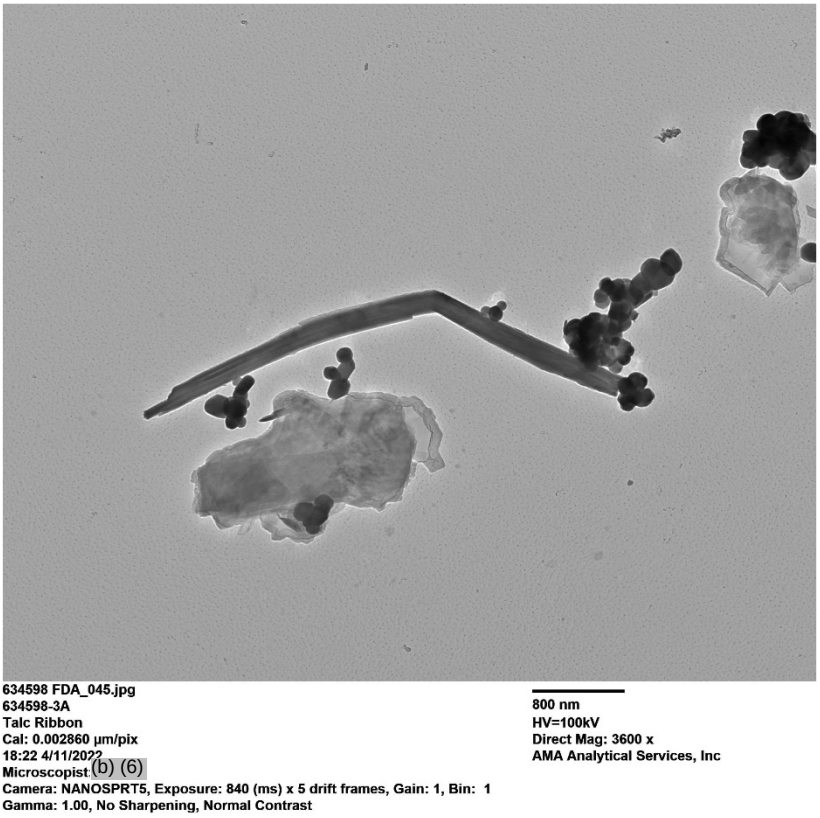
634598 FDA_042.jpg
634598-3A
Talc Fiber
17:45 4/11/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-3A, Talc Ribbon

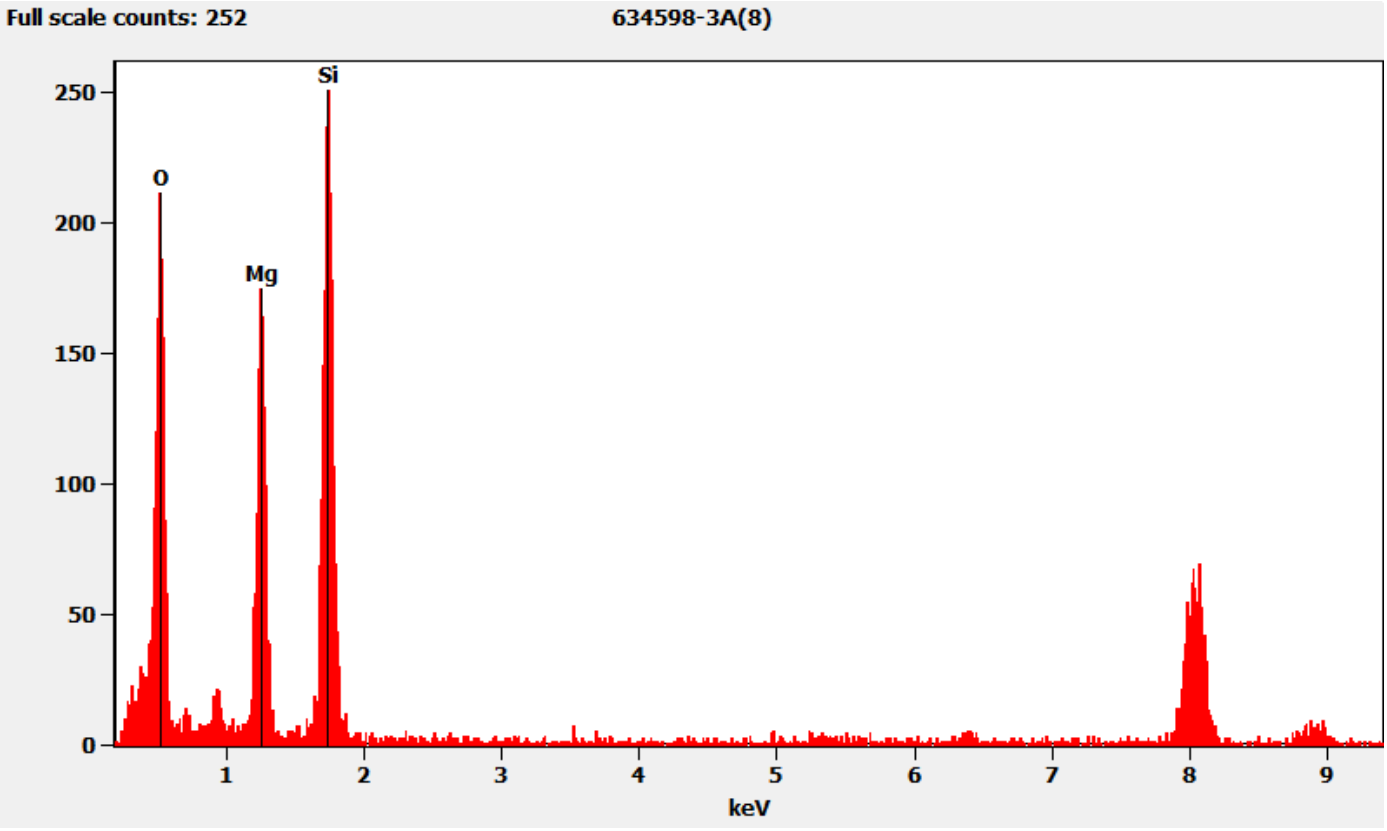


Diffraction Pattern from the Talc Ribbon Pictured Above

634598 FDA_044.jpg
634598-3A
Talc Ribbon
18:21 4/11/2022
Microscopist (b) (6)
Camera: NANOSPEAR75, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-4A, 4B, 4C/Client Sample: 03022022-4

PLM

All three aliquots of sample 03022022-4 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-4A	No Asbestos Detected
634598-4B	No Asbestos Detected
634598-4C	No Asbestos Detected

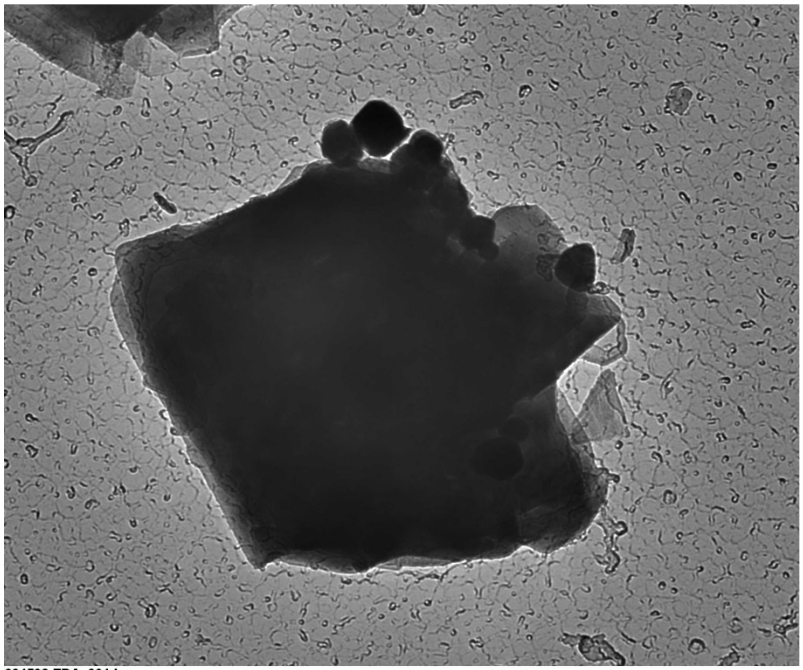
TEM

(b) (6) analyzed aliquots 4A and 4C on April 8, 2022. (b) (6) analyzed aliquot 4B on April 11, 2022, through April 12, 2022. The primary particles observed were talc and titanium; mica particles, silica spheres and elongated talc particles were also observed along with talc ribbons. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-4A	No Asbestos Detected
634598-4B	No Asbestos Detected
634598-4C	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.

634598-4A, Talc Particle

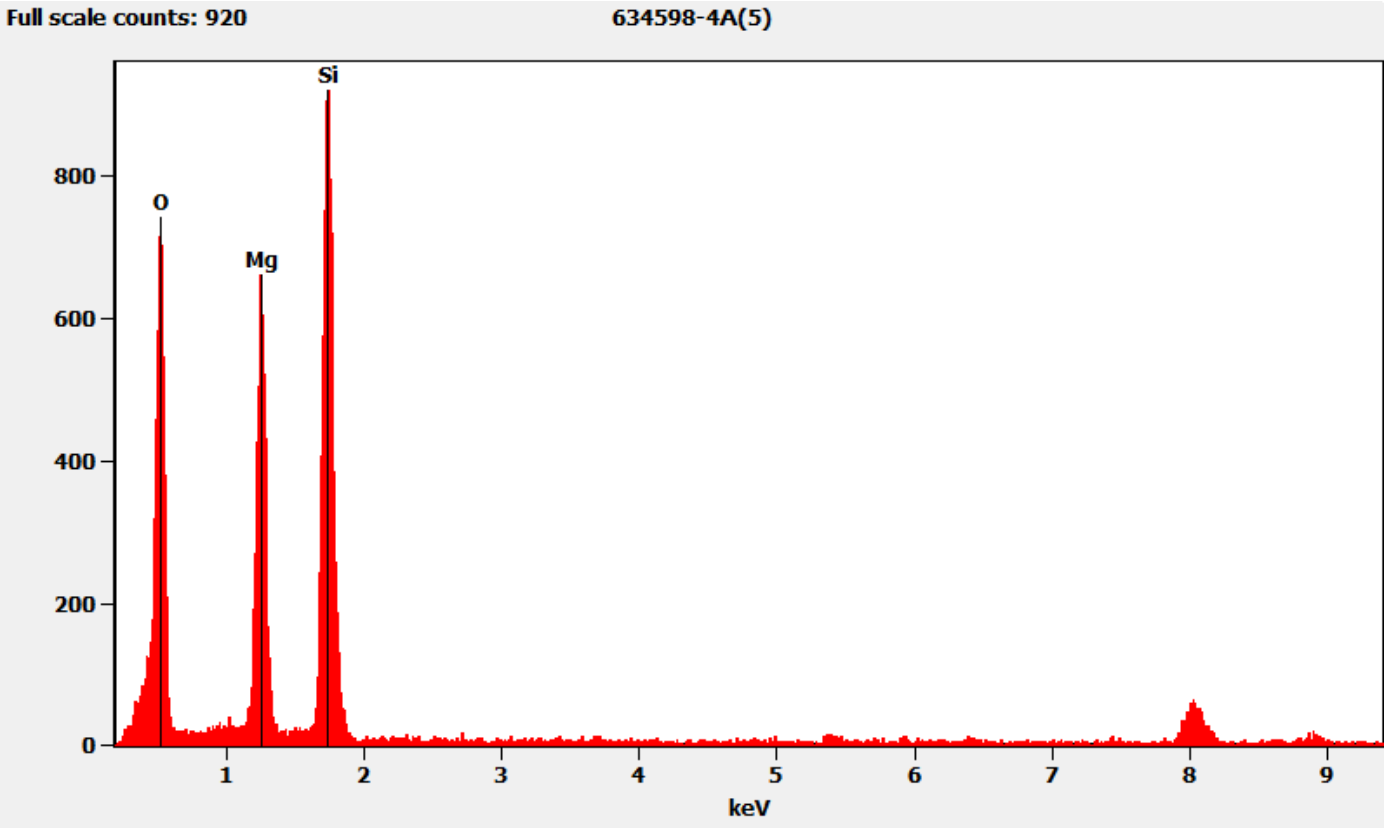


Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

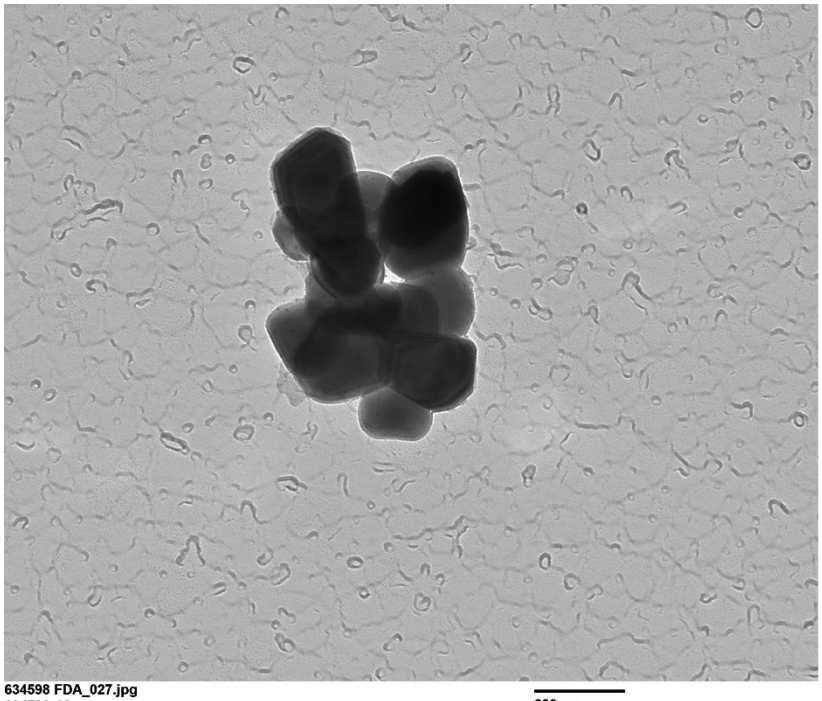
634598 FDA_030.jpg
634598-4A
Talc Particle
14:54 4/8/2022
Microscopist (b) (6)
Camera: NA[illegible]5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



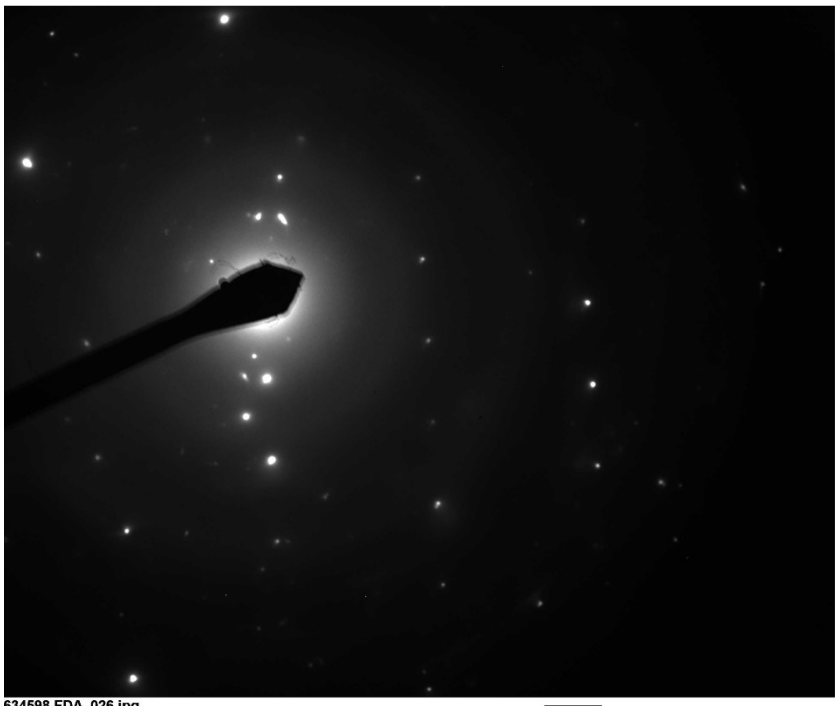
634598-4A, Titanium Particles



634598 FDA_027.jpg
634598-4A
Ti Particle
Cal: 0.726816 nm/pix
14:16 4/8/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=100kV
Direct Mag: 14000 x
AMA Analytical Services, Inc

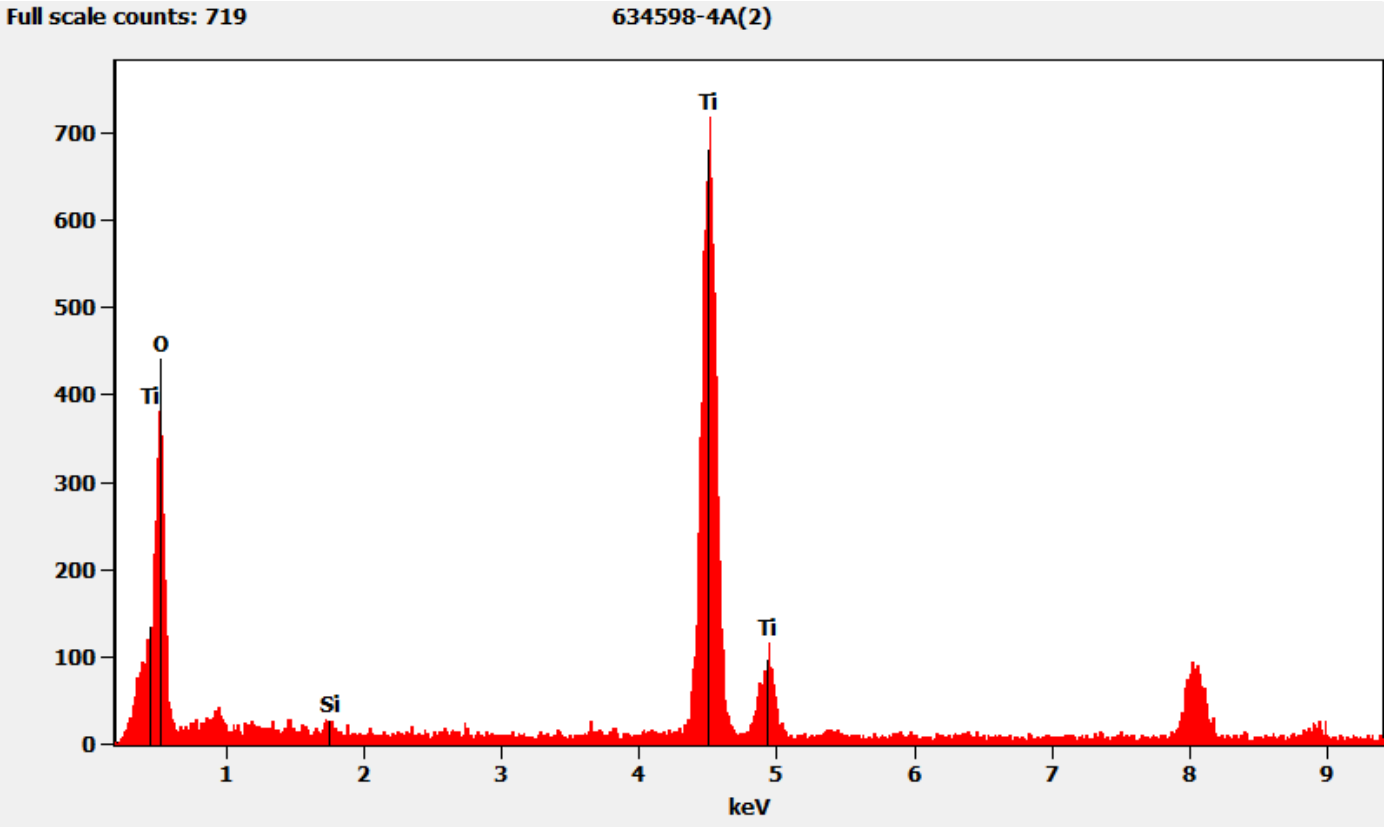
Diffraction Pattern from the Titanium Particles Pictured Above



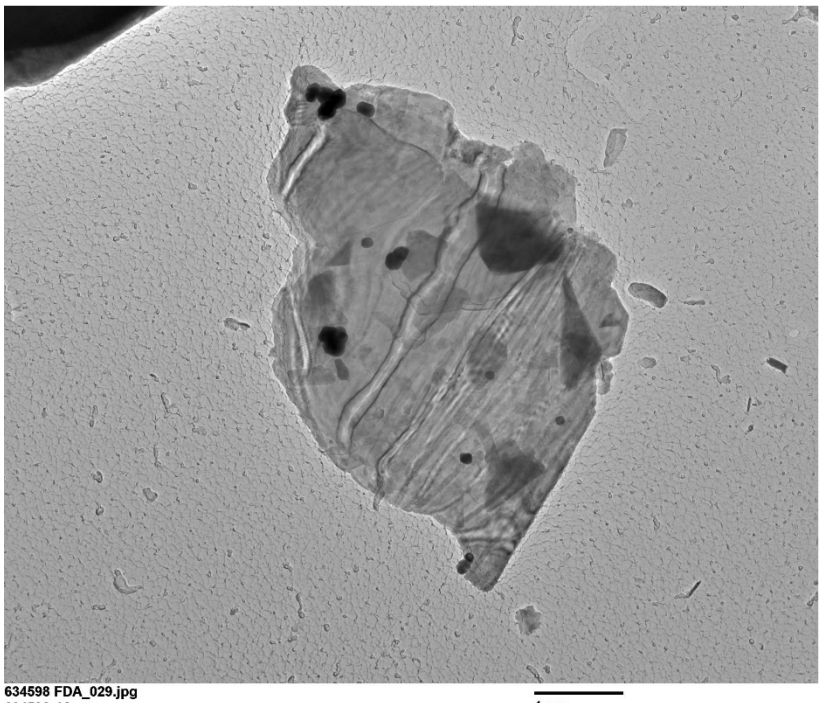
634598 FDA_026.jpg
634598-4A
Ti Particle
14:15 4/8/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Titanium Particles Pictured Above



634598-4A, Mica Particle

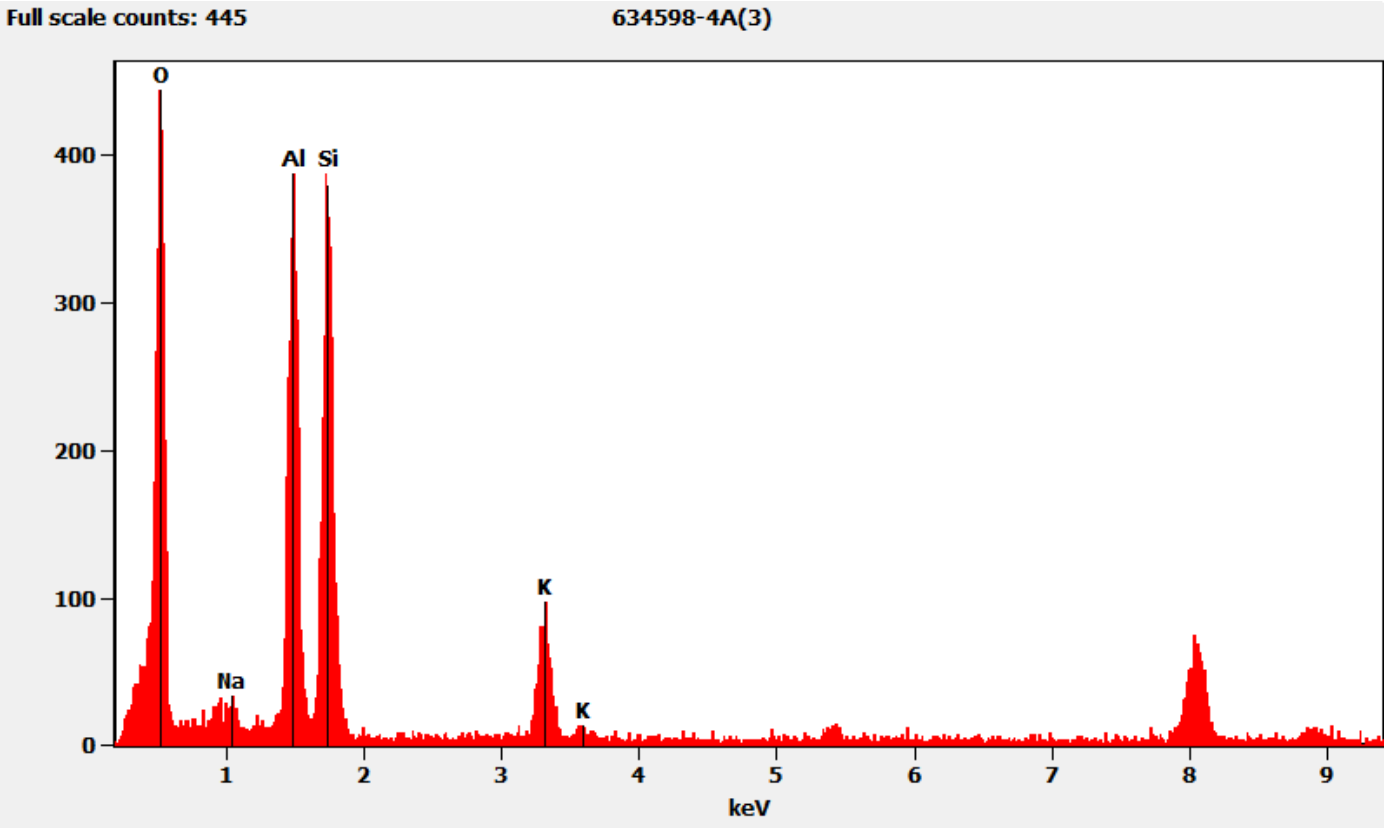


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

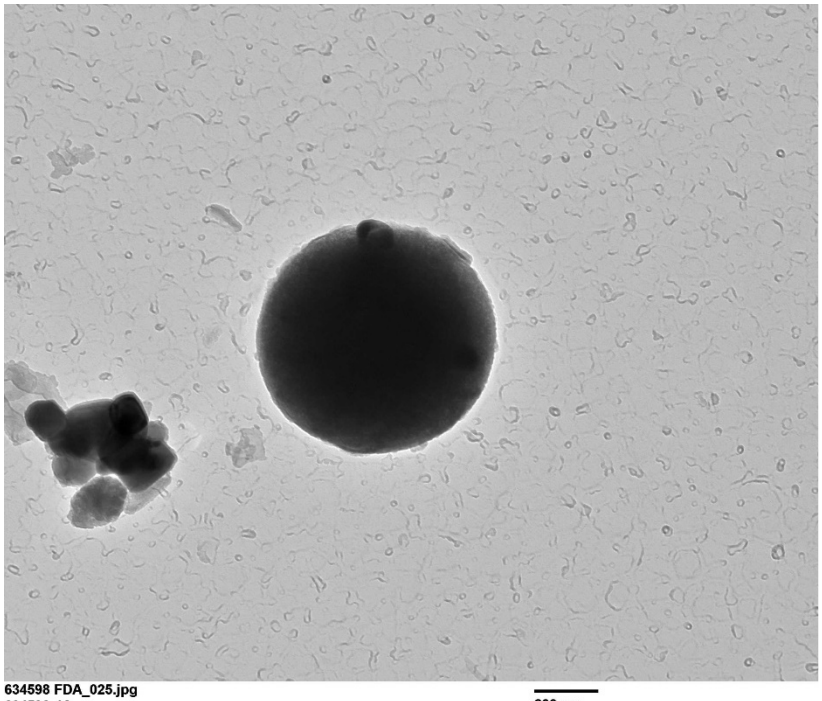
634598 FDA_028.jpg
634598-4A
Mica Particle
14:20 4/8/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle Pictured Above



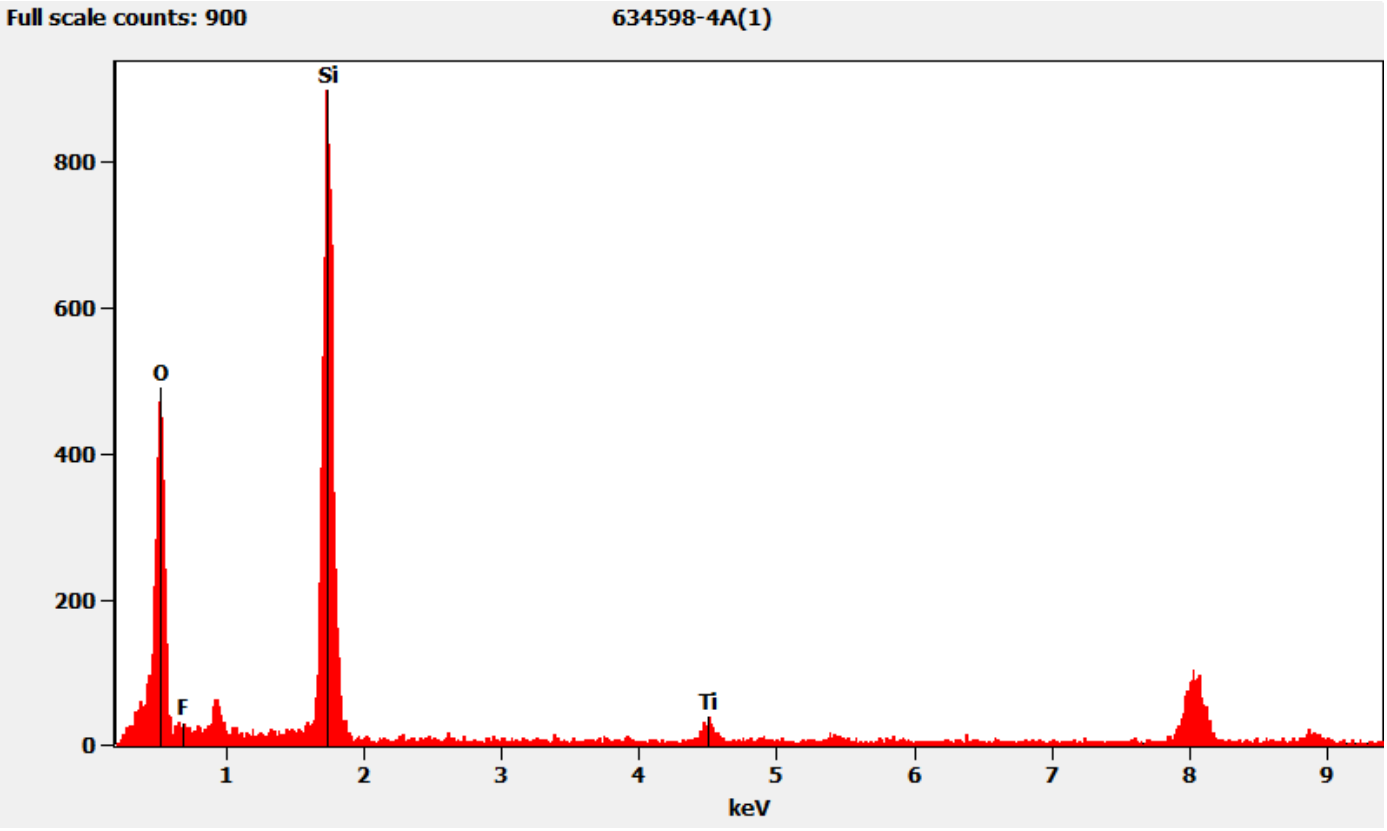
634598-4A, Silica Sphere



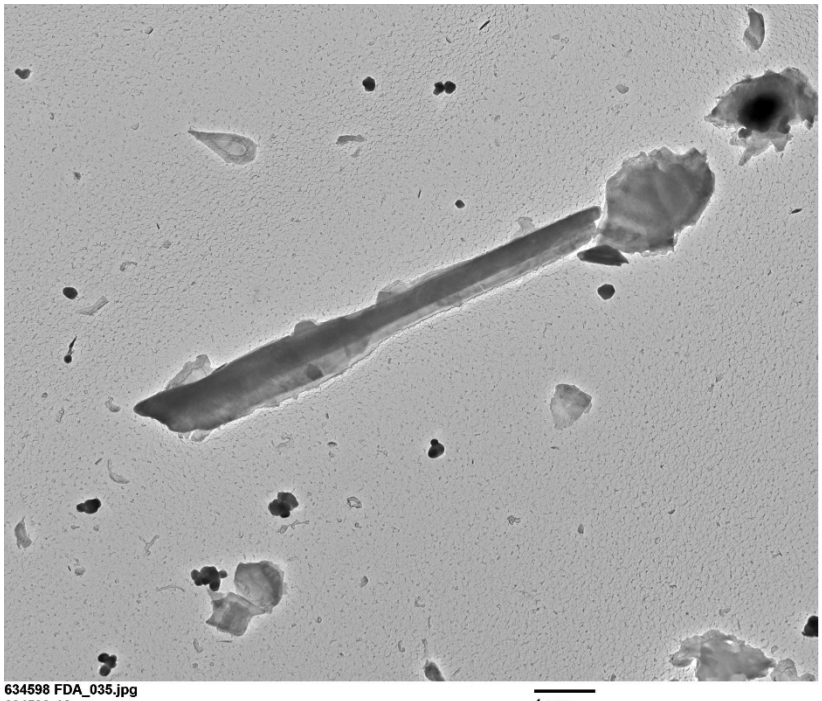
634598 FDA_025.jpg
634598-4A
Si Sphere
Cal: 0.001030 µm/pix
14:12 4/8/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=100kV
Direct Mag: 10000 x
AMA Analytical Services, Inc

Chemistry from the Silica Sphere Pictured Above



634598-4A, Elongated Talc Particle



634598 FDA_035.jpg
634598-4A
Elongated Talc
Cal: 0.005419 µm/pix
15:39 4/8/2022
Microscopist (b) (6)
Camera: NA[illegible]5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

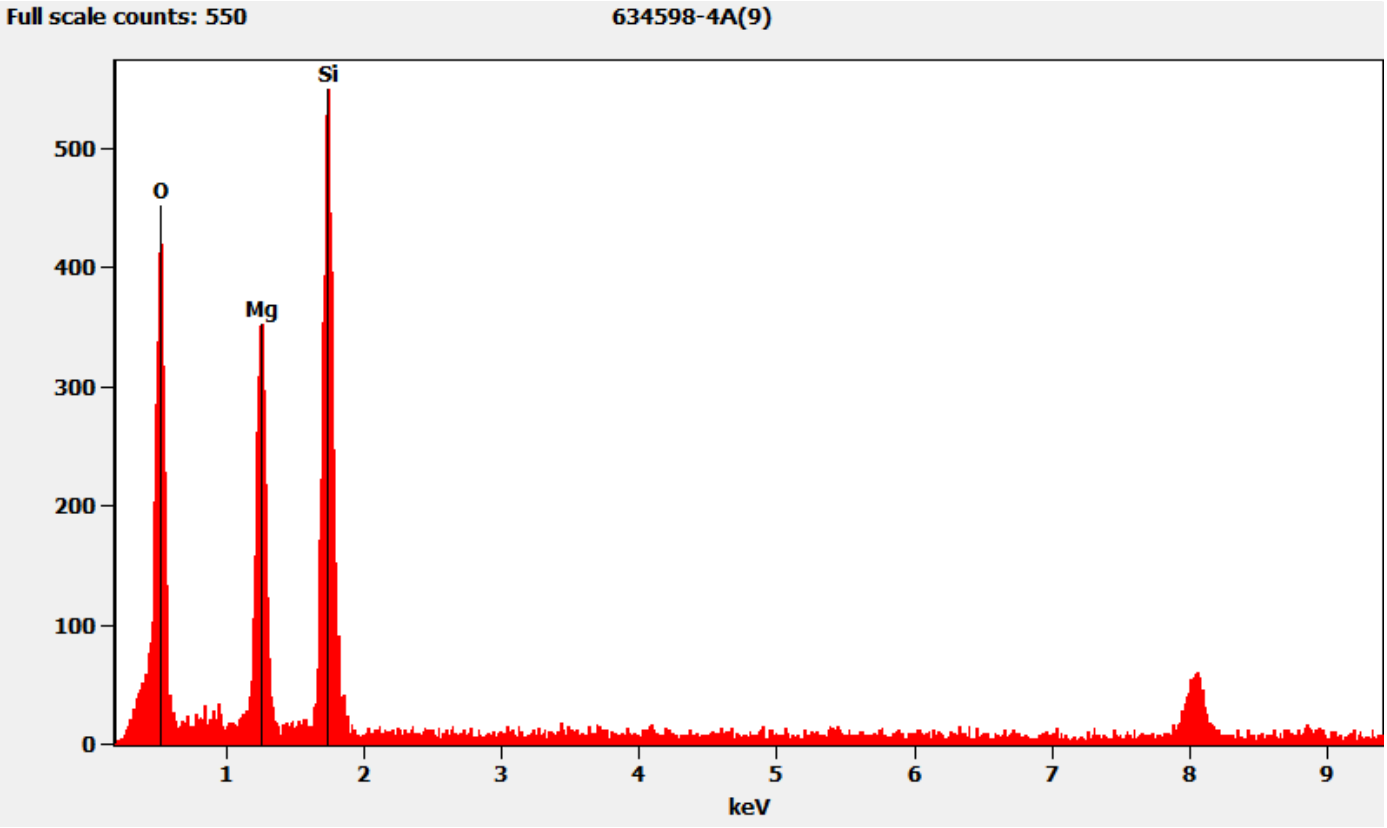
1 µm
HV=100kV
Direct Mag: 1900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

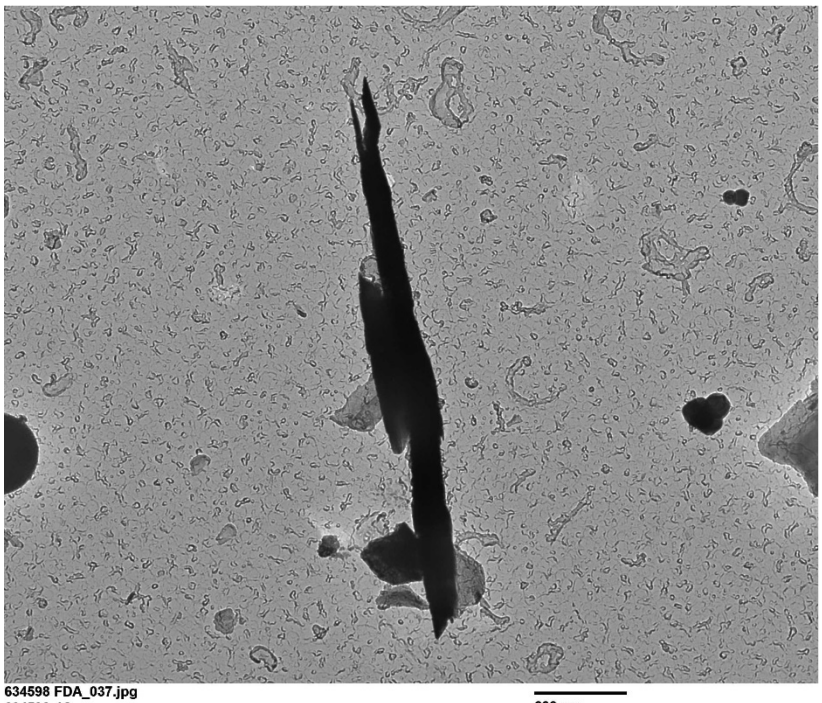
634598 FDA_034.jpg
634598-4A
Elongated Talc
15:38 4/8/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-4C, Talc Ribbon

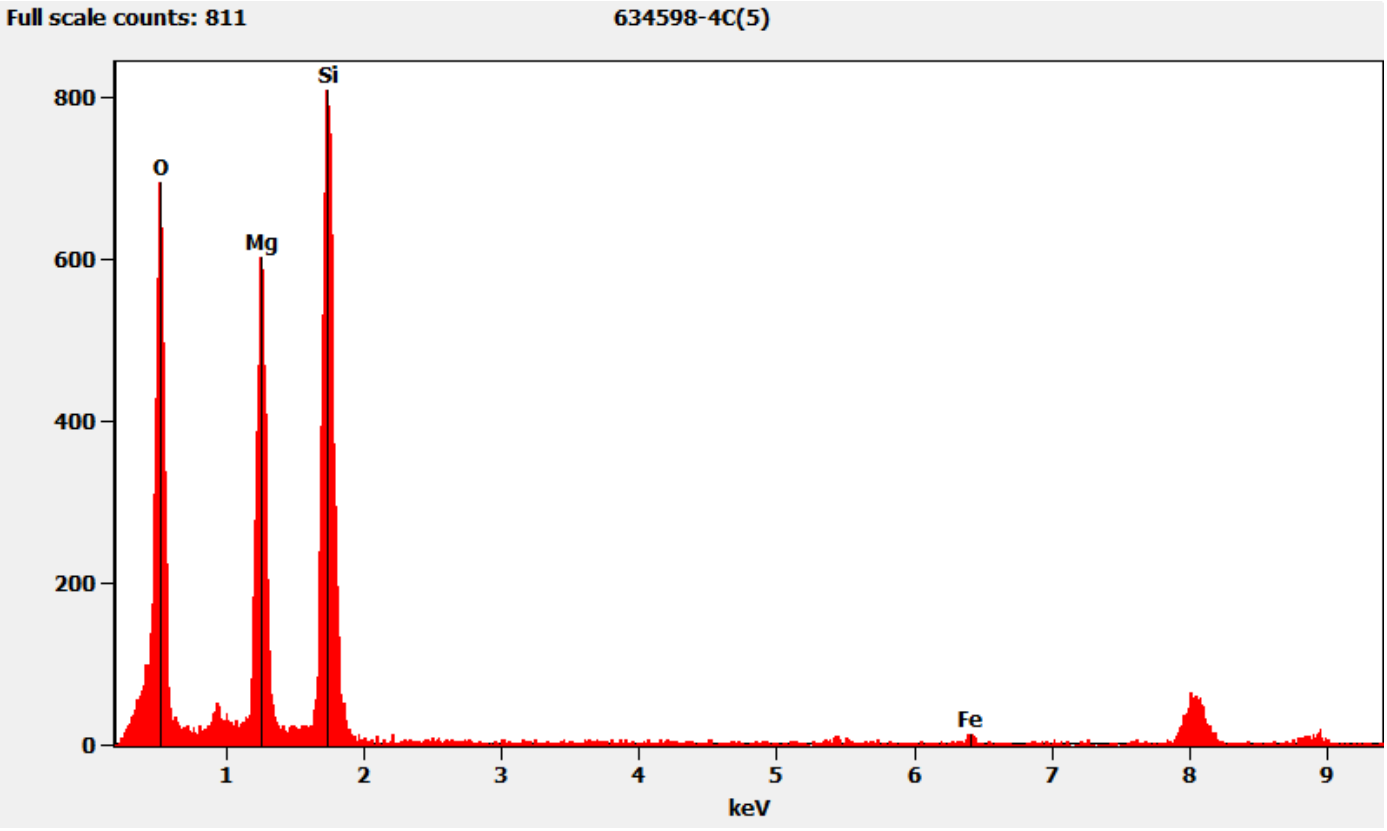


Diffraction Pattern from the Talc Ribbon Pictured Above

634598 FDA_036.jpg
634598-4C
Talc Ribbon
16:42 4/8/2022
Microscopist (b) (6)
Camera: NANOSPR15, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-5A, 5B, 5C/Client Sample: 03022022-5

PLM

All three aliquots of sample 03022022-5 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-5A	No Asbestos Detected
634598-5B	No Asbestos Detected
634598-5C	No Asbestos Detected

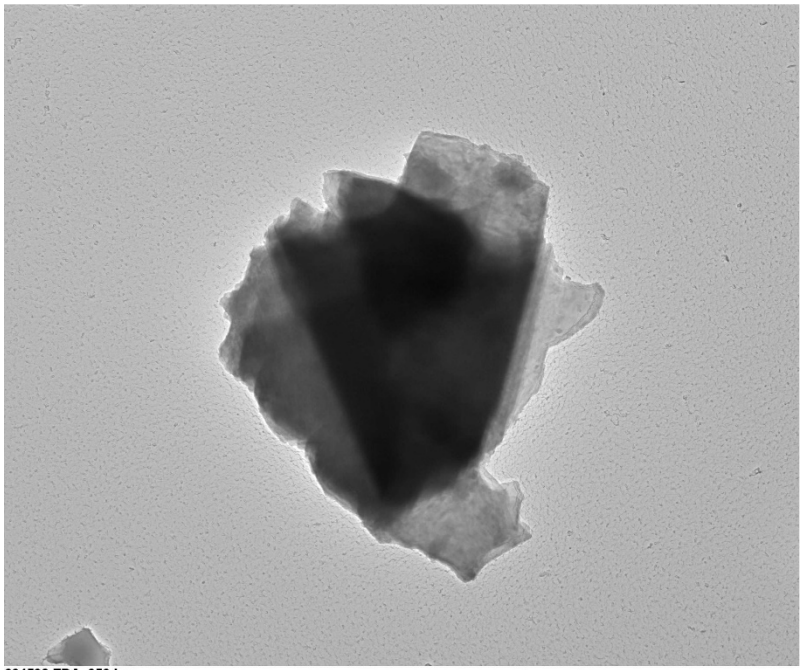
TEM

(b) (6) analyzed aliquot 5A on April 13, 2022, through April 18, 2022, aliquot 5B on April 13, 2022, and aliquot 5C on April 18, 2022. The primary particle observed was talc; elongated talc particles, talc ribbons and silica spheres were also observed along with mica particles containing titanium and calcium 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.

634598-5A	No Asbestos Detected
634598-5B	No Asbestos Detected
634598-5C	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.

634598-5A, Talc Particle

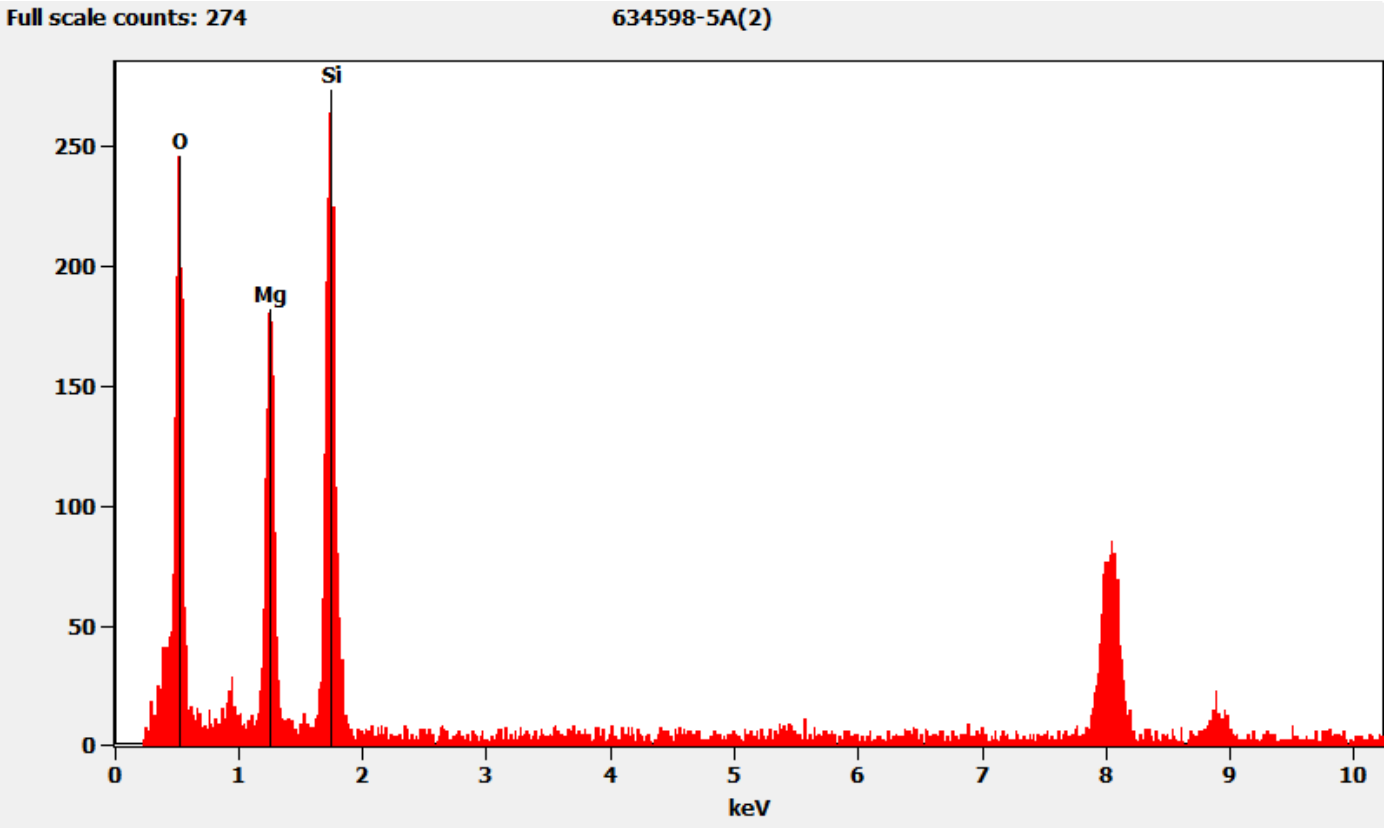


Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

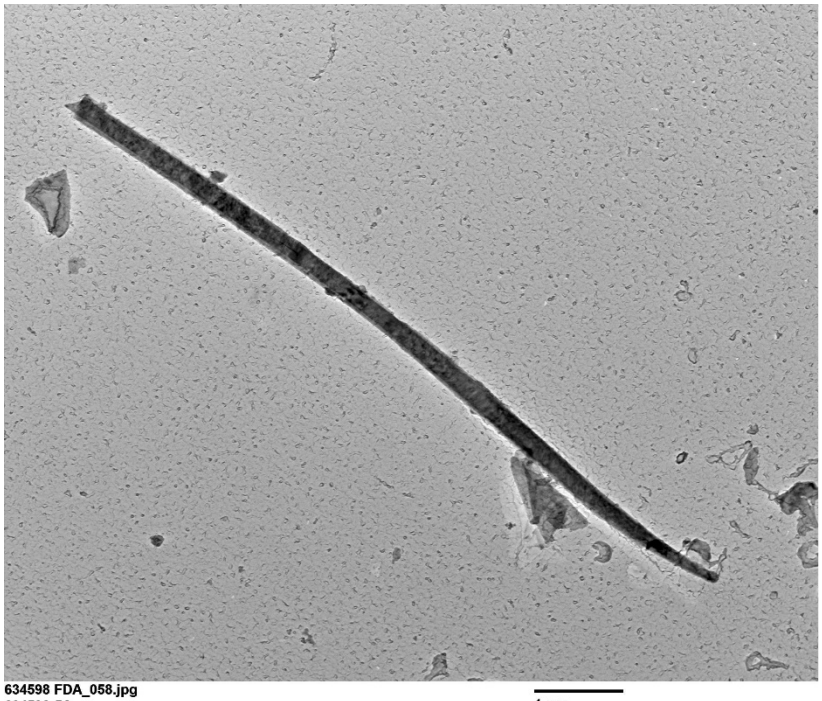
634598 FDA_049.jpg
634598-5A
Talc Particle
16:03 4/12/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-5A, Talc Fiber



634598 FDA_058.jpg
634598-5A
Talc Fiber
Cal: 0.003702 µm/pix
17:45 4/12/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

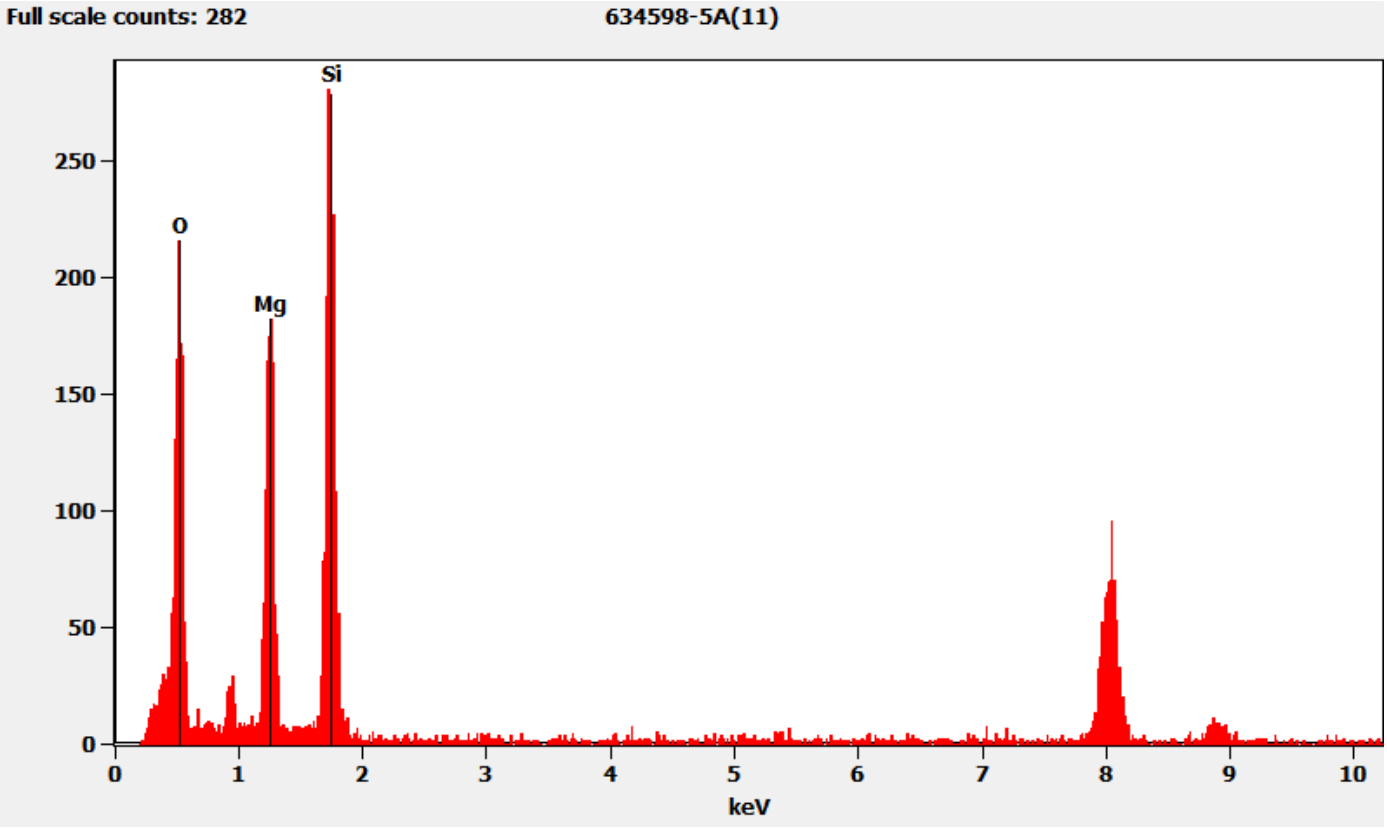
1 µm
HV=100kV
Direct Mag: 2900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Fiber Pictured Above

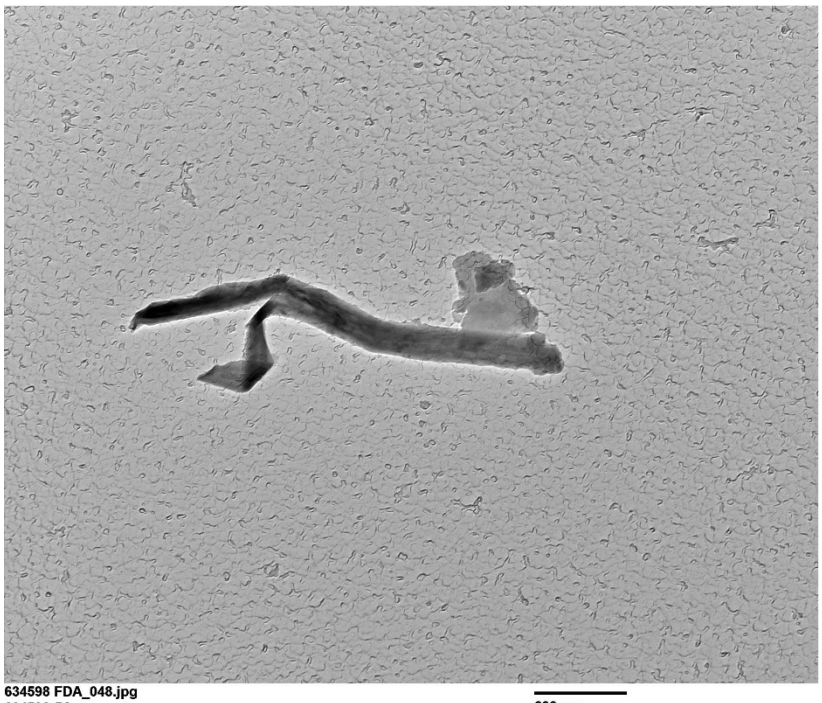
634598 FDA_057.jpg
634598-5A
Talc Fiber
17:43 4/12/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Fiber Pictured Above



634598-5A, Talc Ribbon

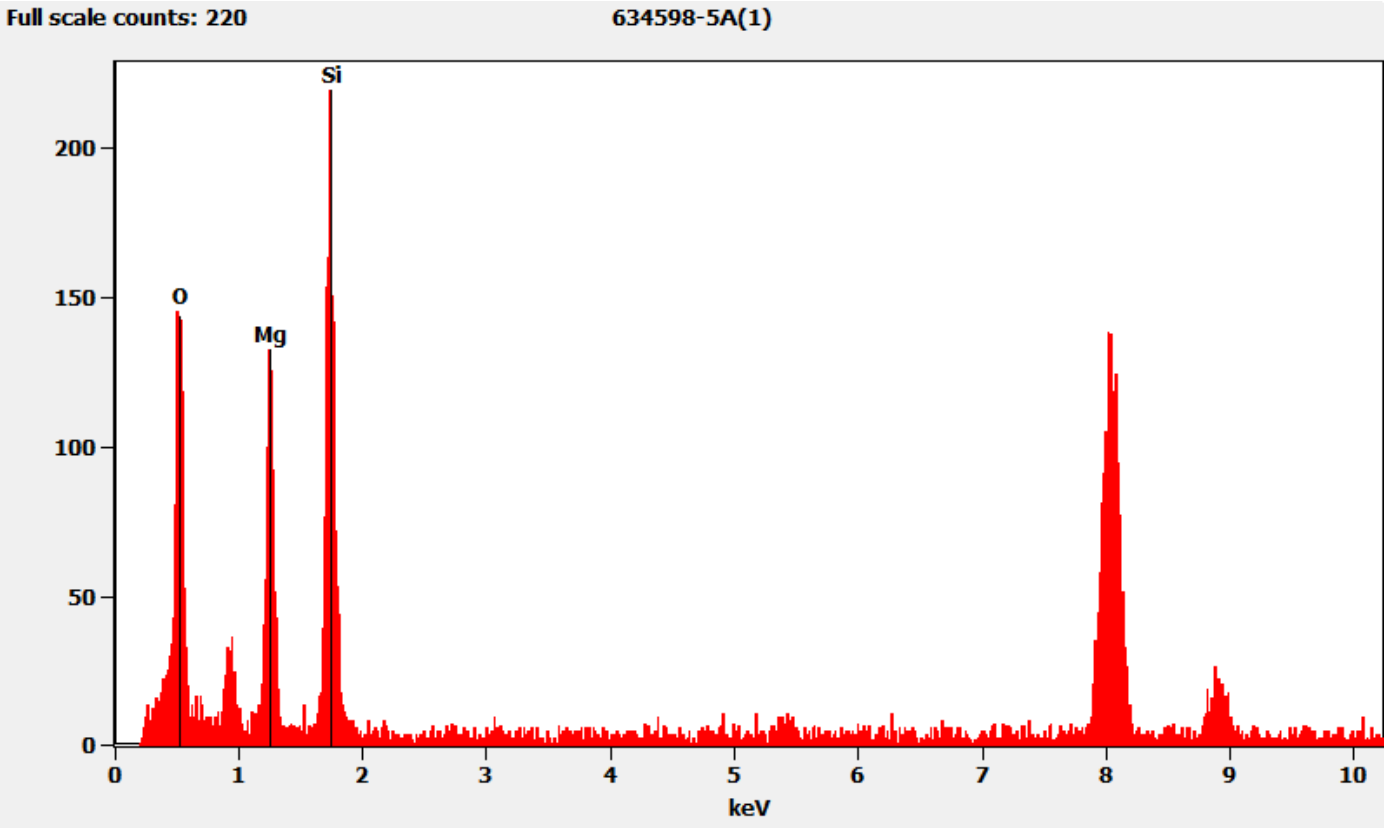


Diffraction Pattern from the Talc Ribbon Pictured Above

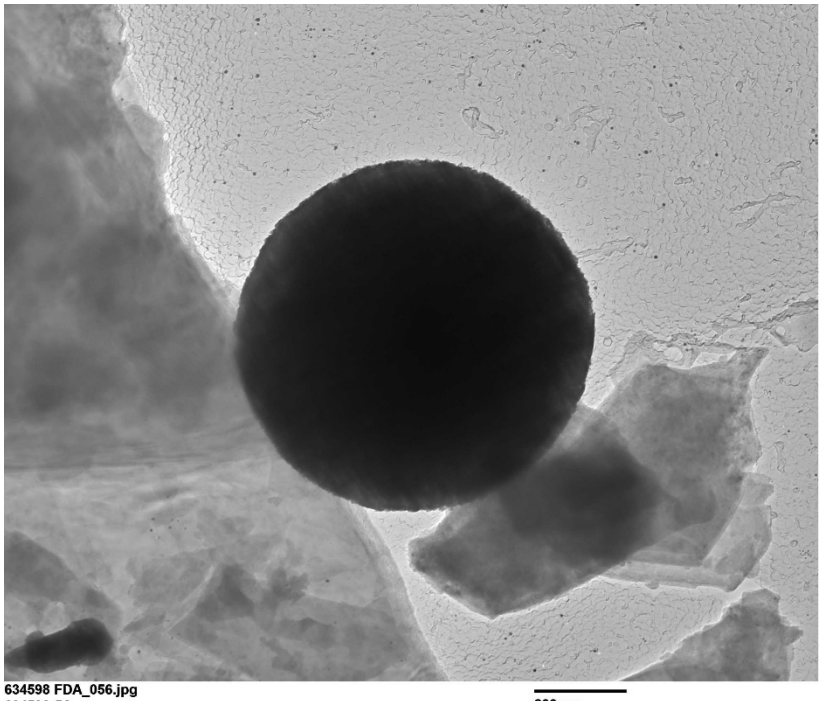
634598 FDA_047.jpg
634598-5A
Talc Ribbon
15:59 4/12/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



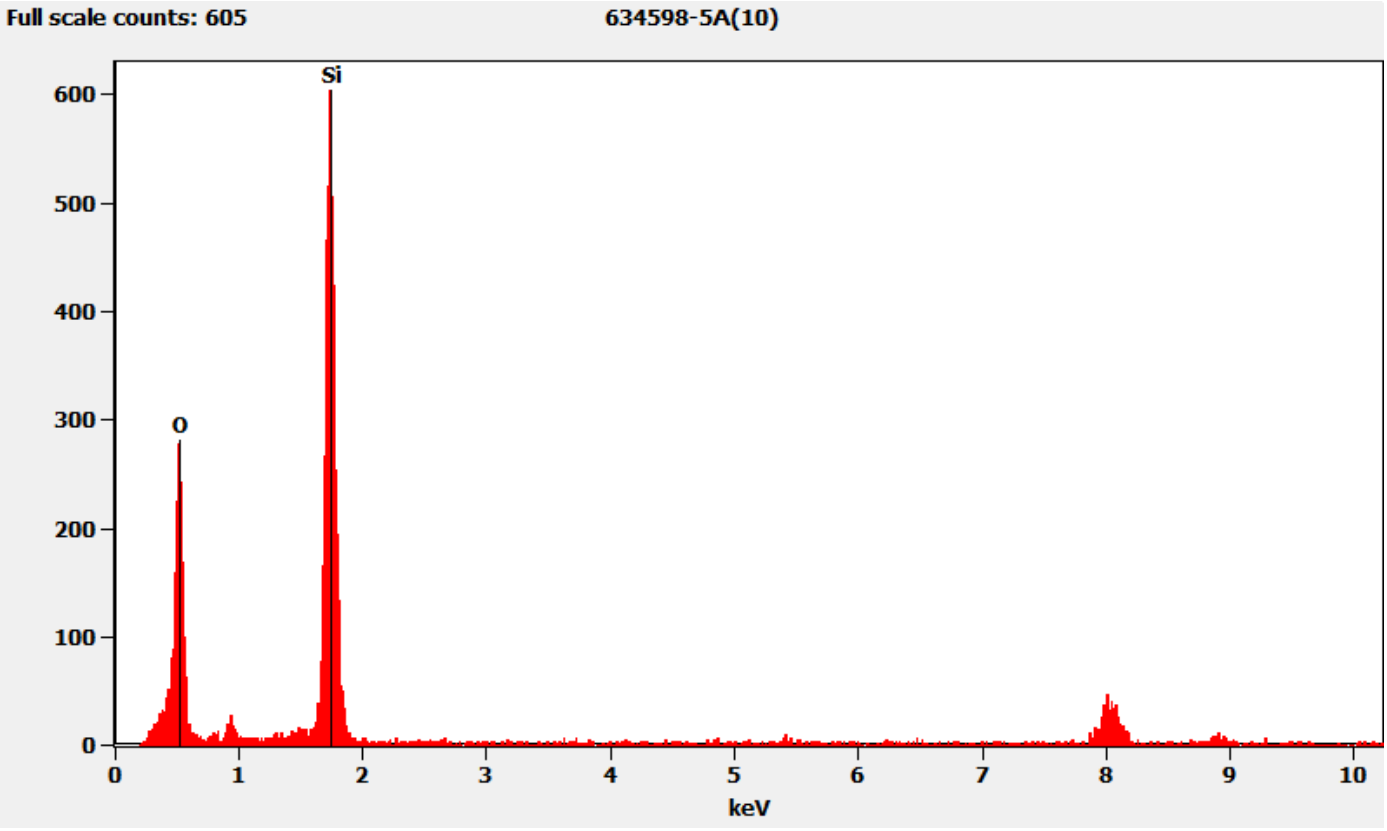
634598-5A, Silica Sphere



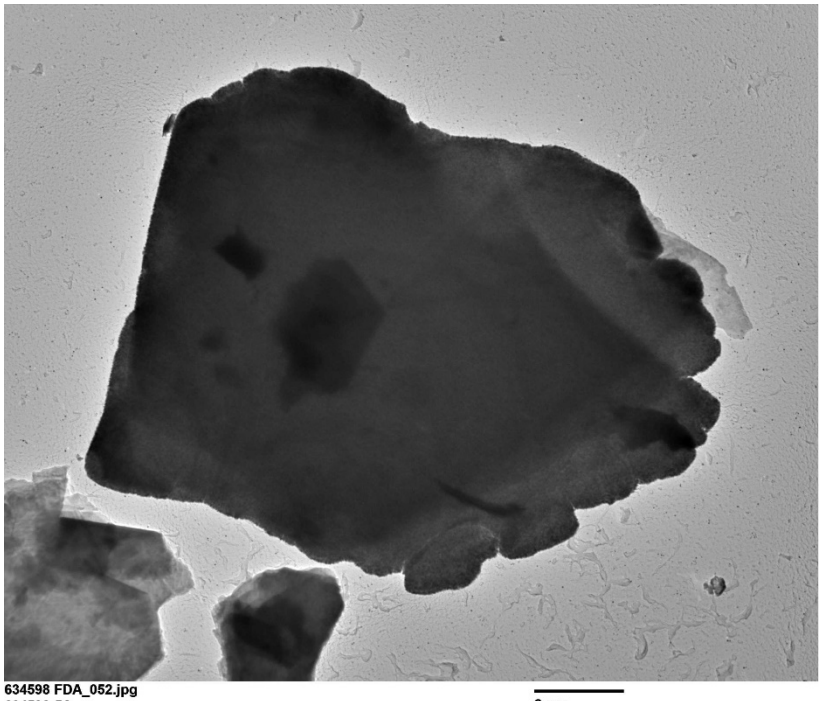
634598 FDA_056.jpg
634598-5A
Silica Sphere
Cal: 0.002860 µm/pix
17:39 4/12/2022
Microscopist(b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

800 nm
HV=100kV
Direct Mag: 3600 x
AMA Analytical Services, Inc

Chemistry from the Silica Sphere Pictured Above



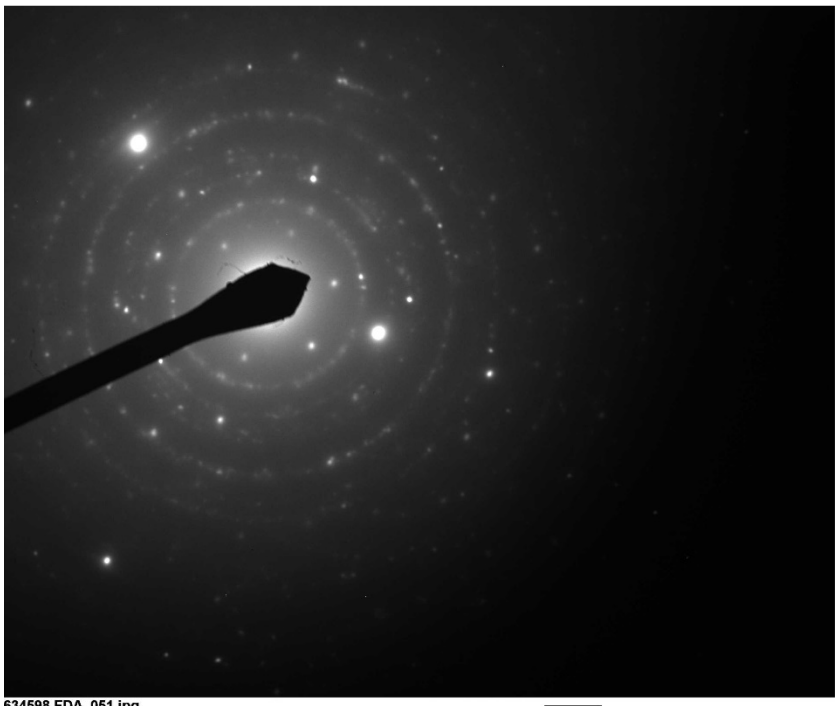
634598-5B, Mica Particle Containing Titanium



634598 FDA_052.jpg
634598-5A
Mica w/Ti
Cal: 0.007355 µm/pix
17:08 4/12/2022
Microscopist: (b) (6)
Camera: NANOSPRIS, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

2 µm
HV=100kV
Direct Mag: 1400 x
AMA Analytical Services, Inc

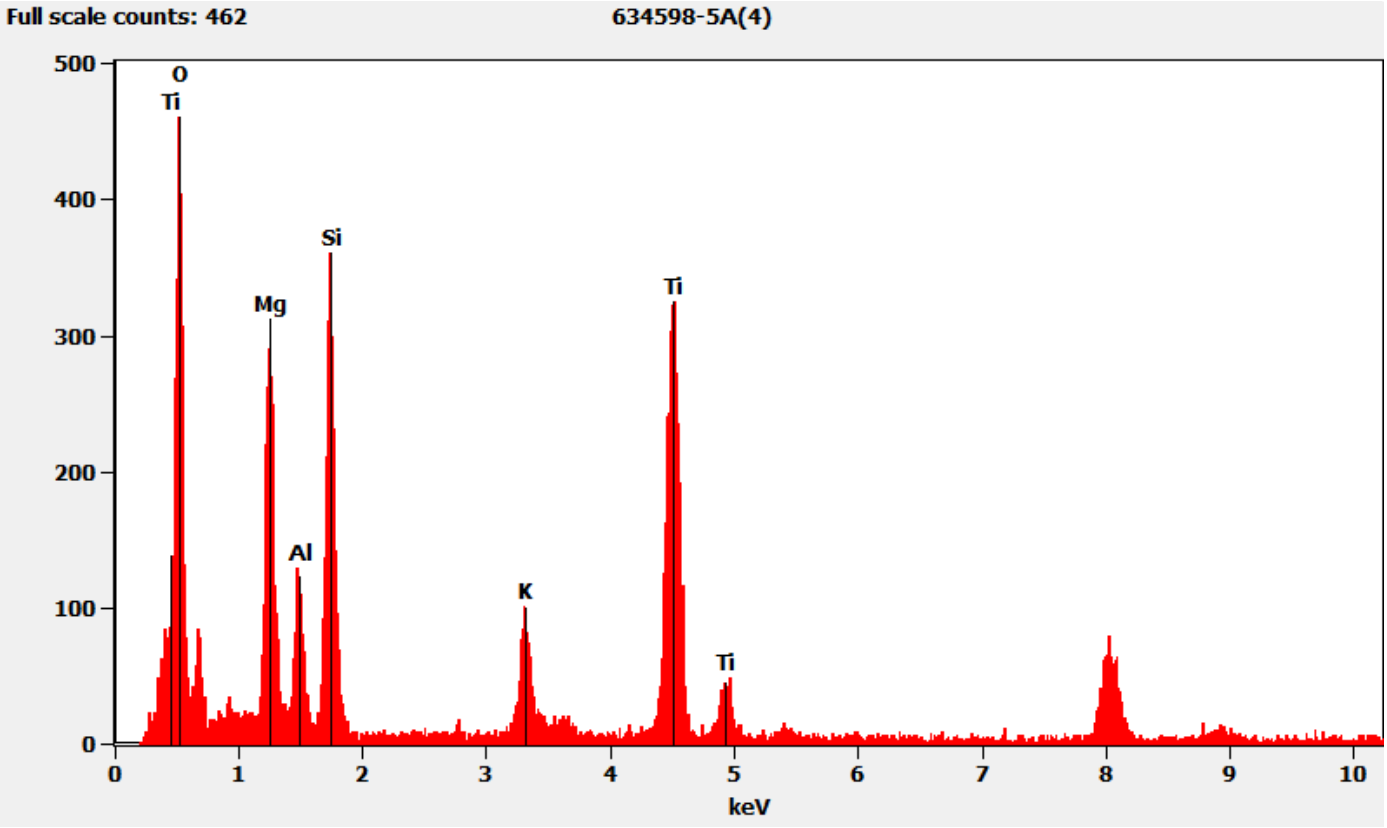
Diffraction Pattern from the Mica Particle Containing Titanium Pictured Above



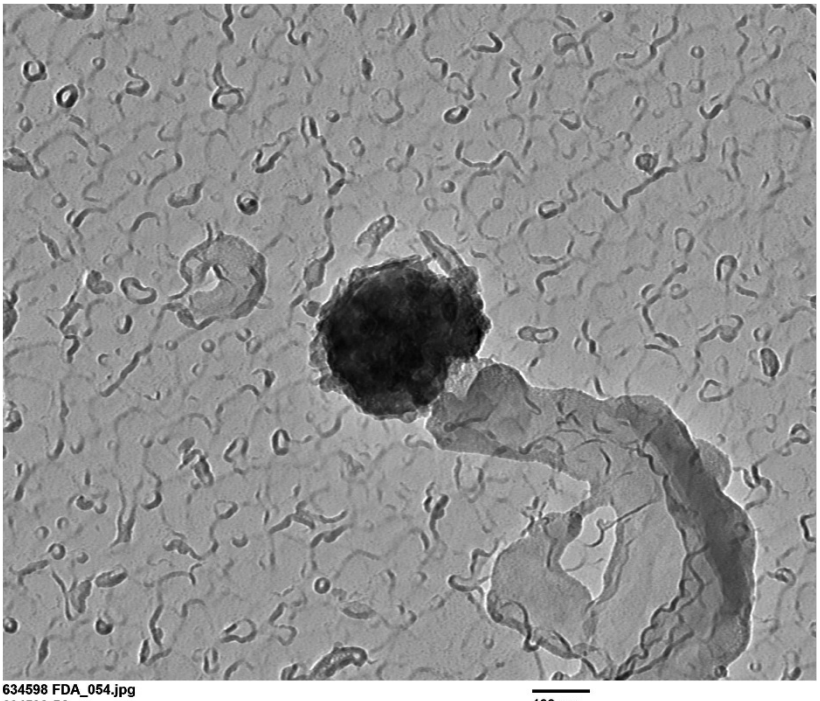
634598 FDA_051.jpg
634598-5A
Mica w/Ti
17:07 4/12/2022
Microscopis (b) (6)
Camera: NANOSPRIS, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

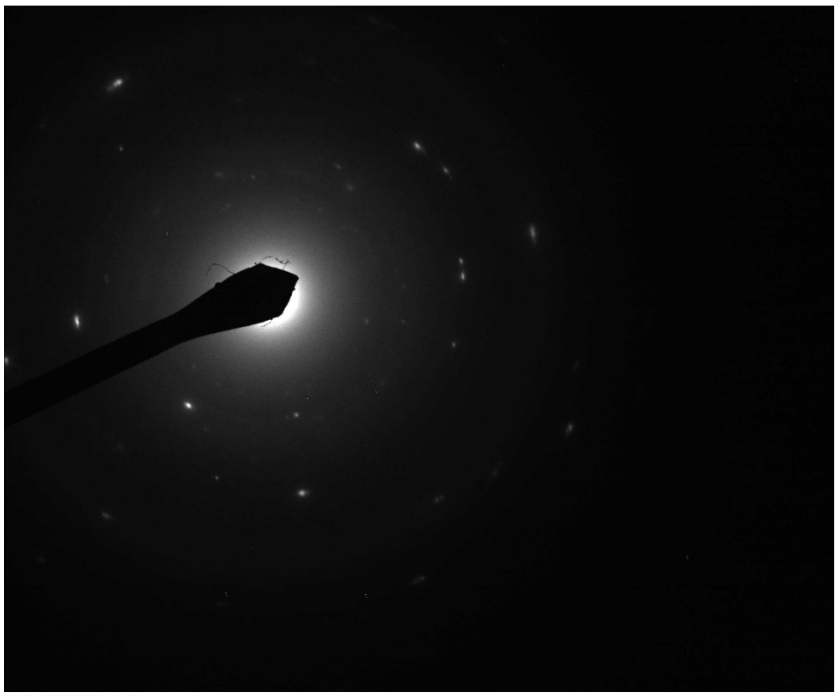
Chemistry from the Mica Particle Containing Titanium Pictured Above



634598-5C, Calcium Particle



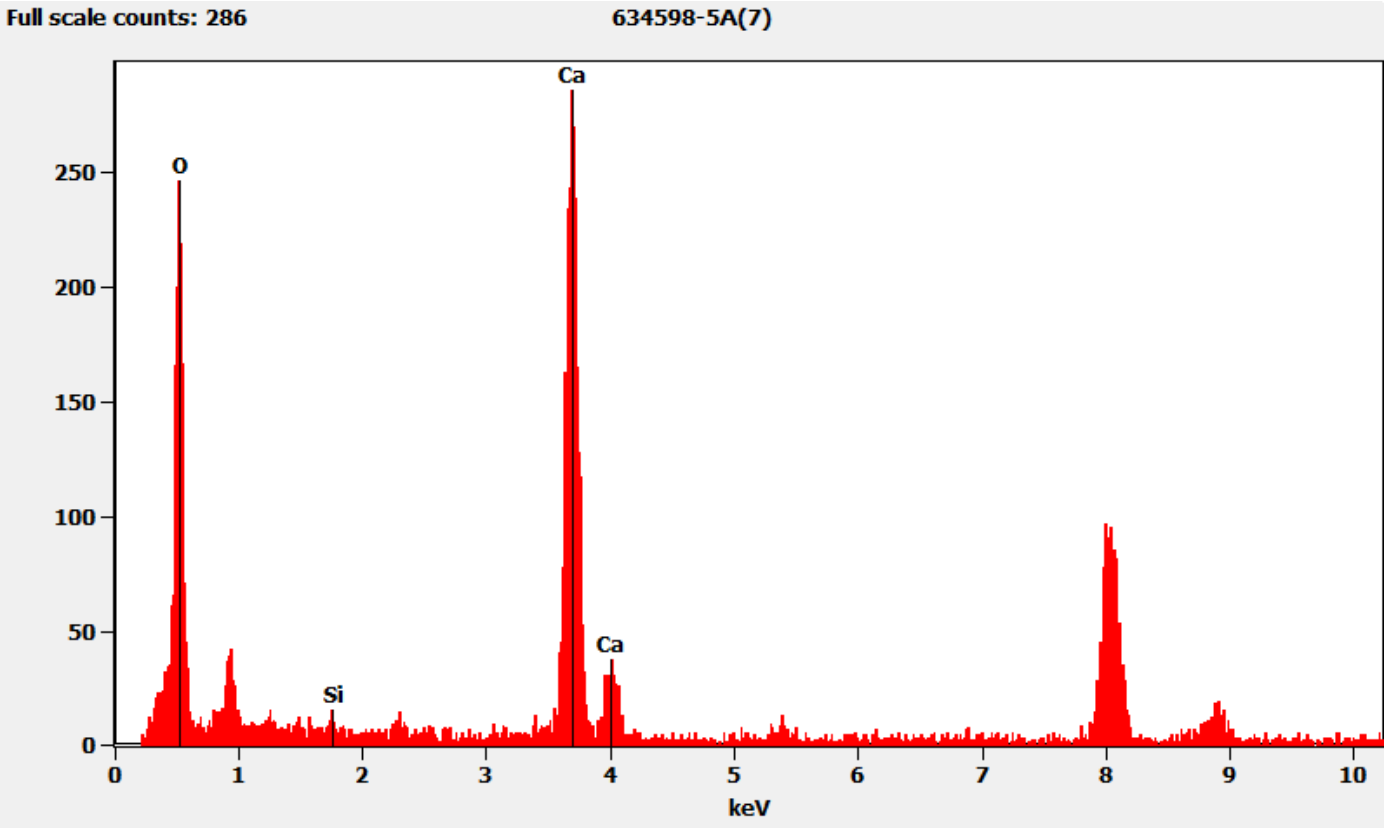
Diffraction Pattern from the Calcium Particle Pictured Above



634598 FDA_053.jpg
634598-5A
Ca Particle
17:29 4/12/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Calcium Particle Pictured Above



634598-6A, 6B, 6C/Client Sample: 03022022-6

PLM

All three aliquots of sample 03022022-6 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-6A	No Asbestos Detected
634598-6B	No Asbestos Detected
634598-6C	No Asbestos Detected

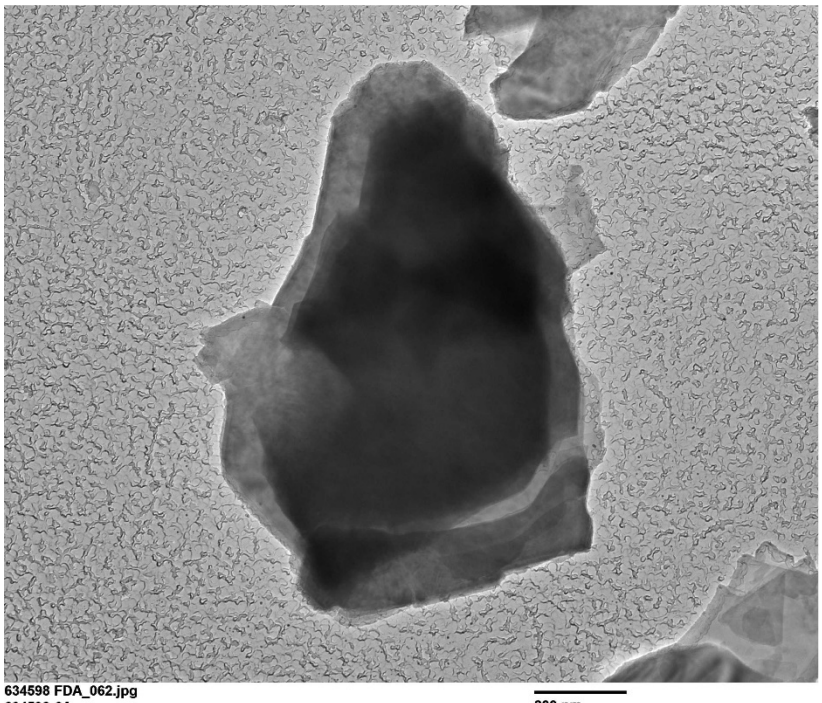
TEM

(b) (6) analyzed aliquot 6A on April 18, 2022, and aliquots 6B and 6C on April 19, 2022. The primary particles observed were talc and mica; elongated talc particles and calcium particles were also observed along with talc ribbons and silica spheres. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-6A	No Asbestos Detected
634598-6B	No Asbestos Detected
634598-6C	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.

634598-6A, Talc Particle

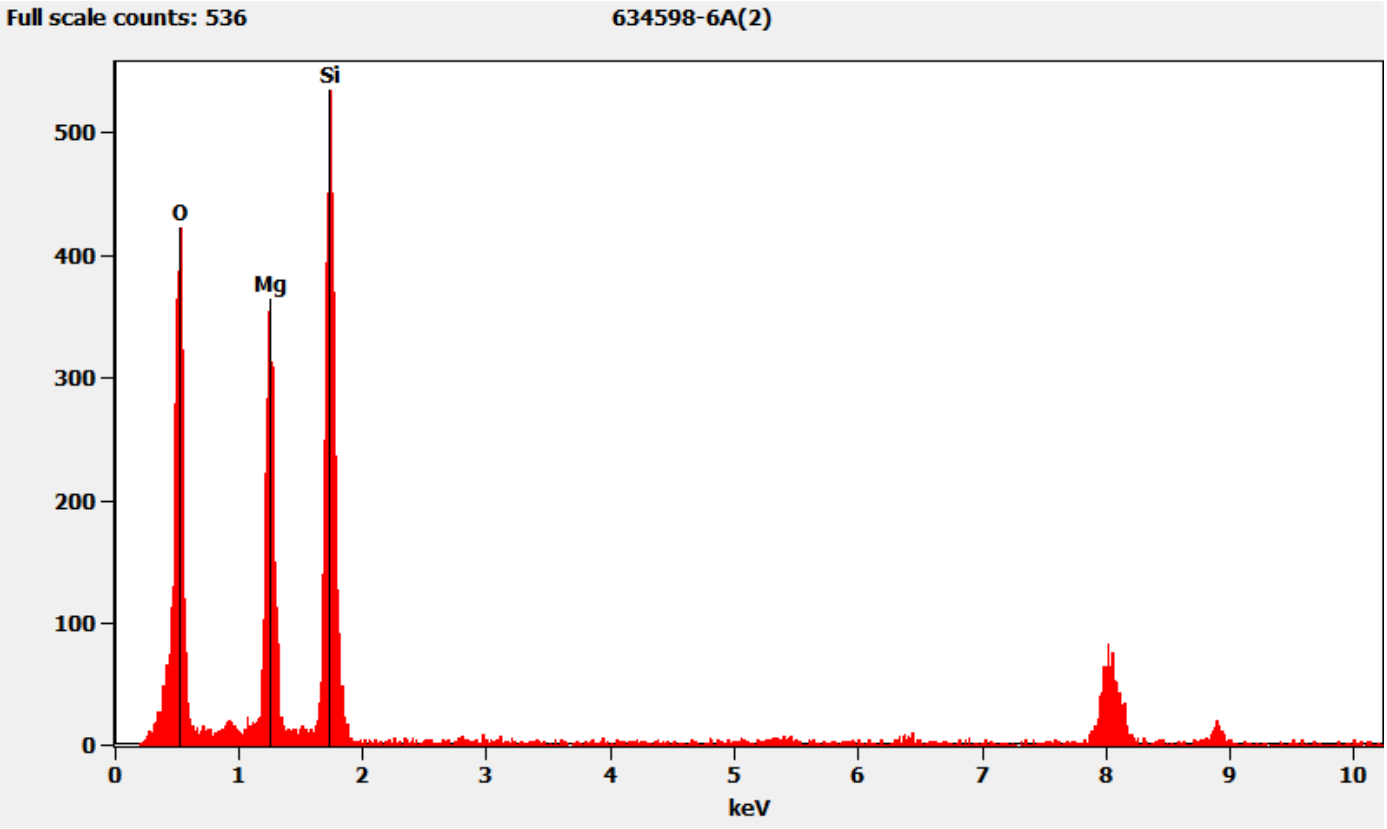


Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

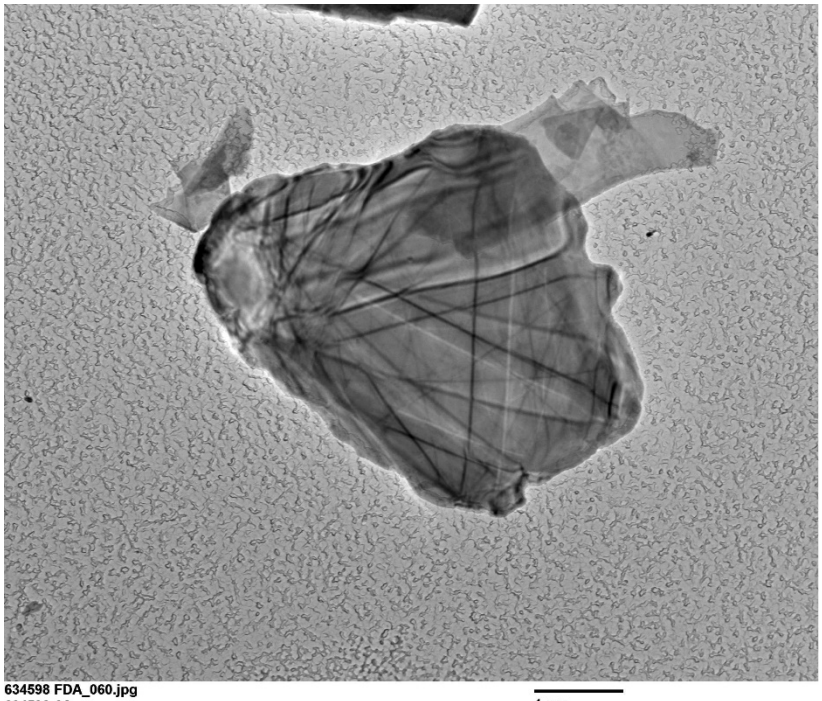
634598 FDA_061.jpg
634598-6A
Talc Particle
14:25 4/18/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-6A, Mica Particle



634598 FDA_060.jpg
634598-6A
Mica Particle
Cal: 0.003702 µm/pix
14:24 4/18/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

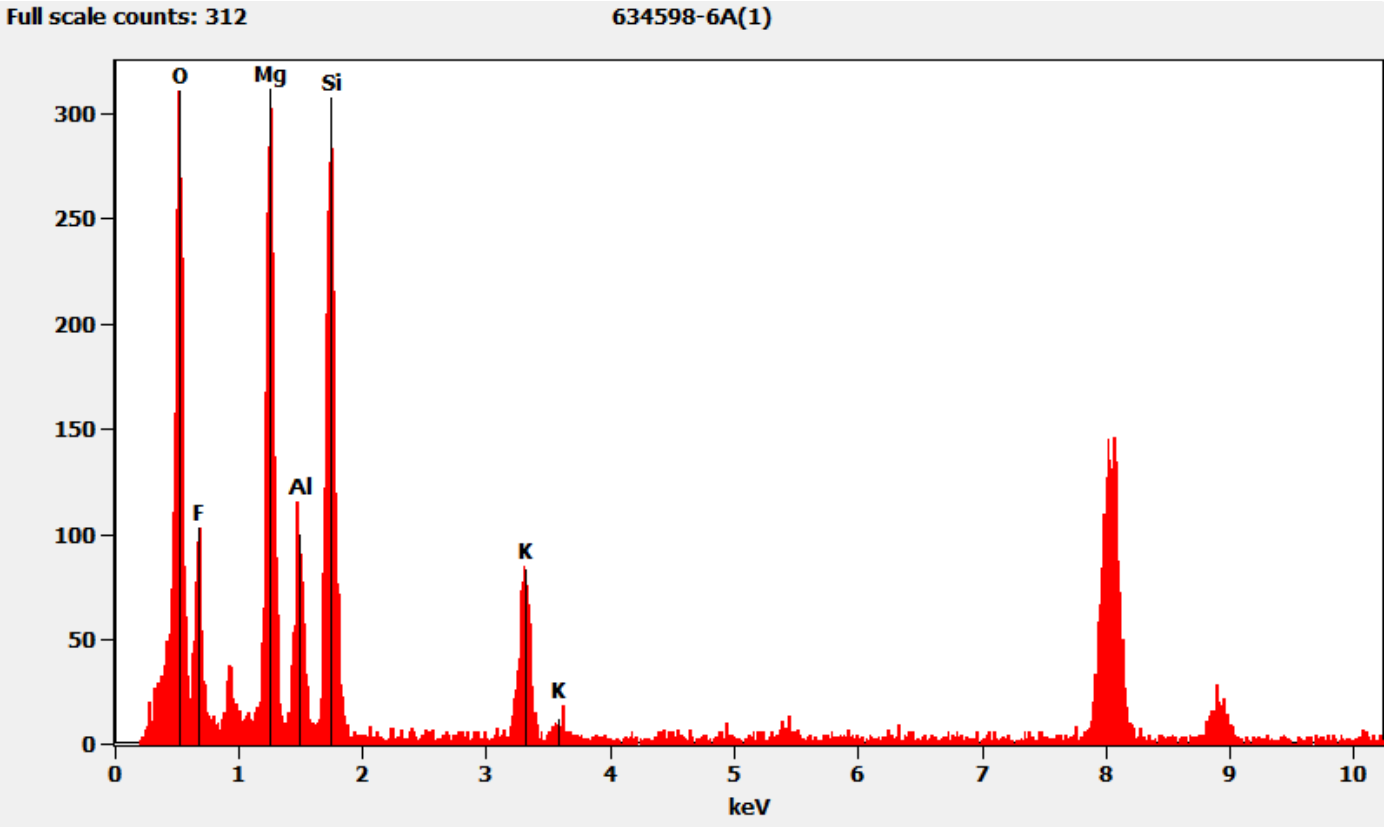
1 µm
HV=100kV
Direct Mag: 2900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

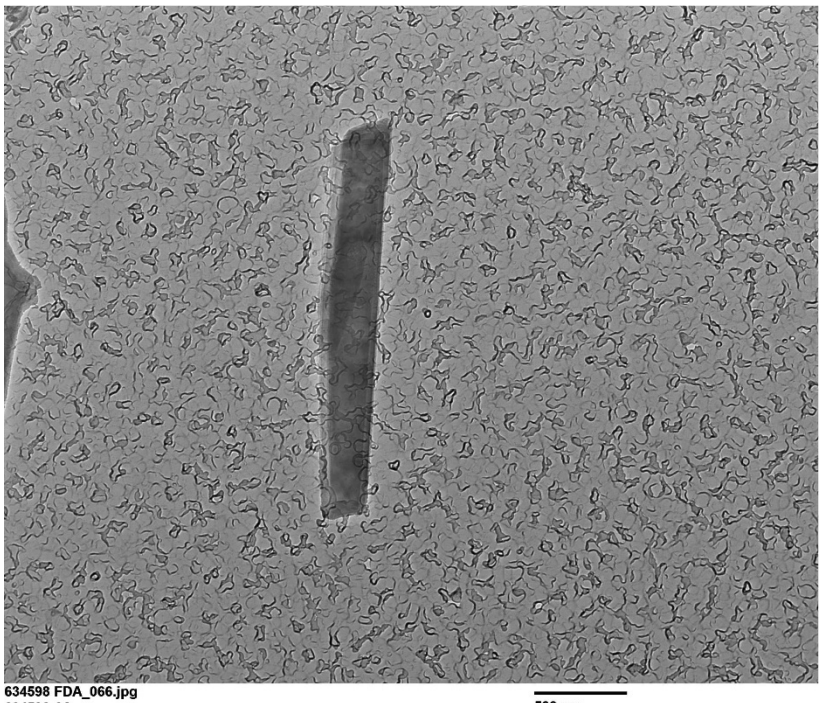
634598 FDA_059.jpg
634598-6A
Mica Particle
14:23 4/18/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle Pictured Above



634598-6A, Elongated Talc Particle

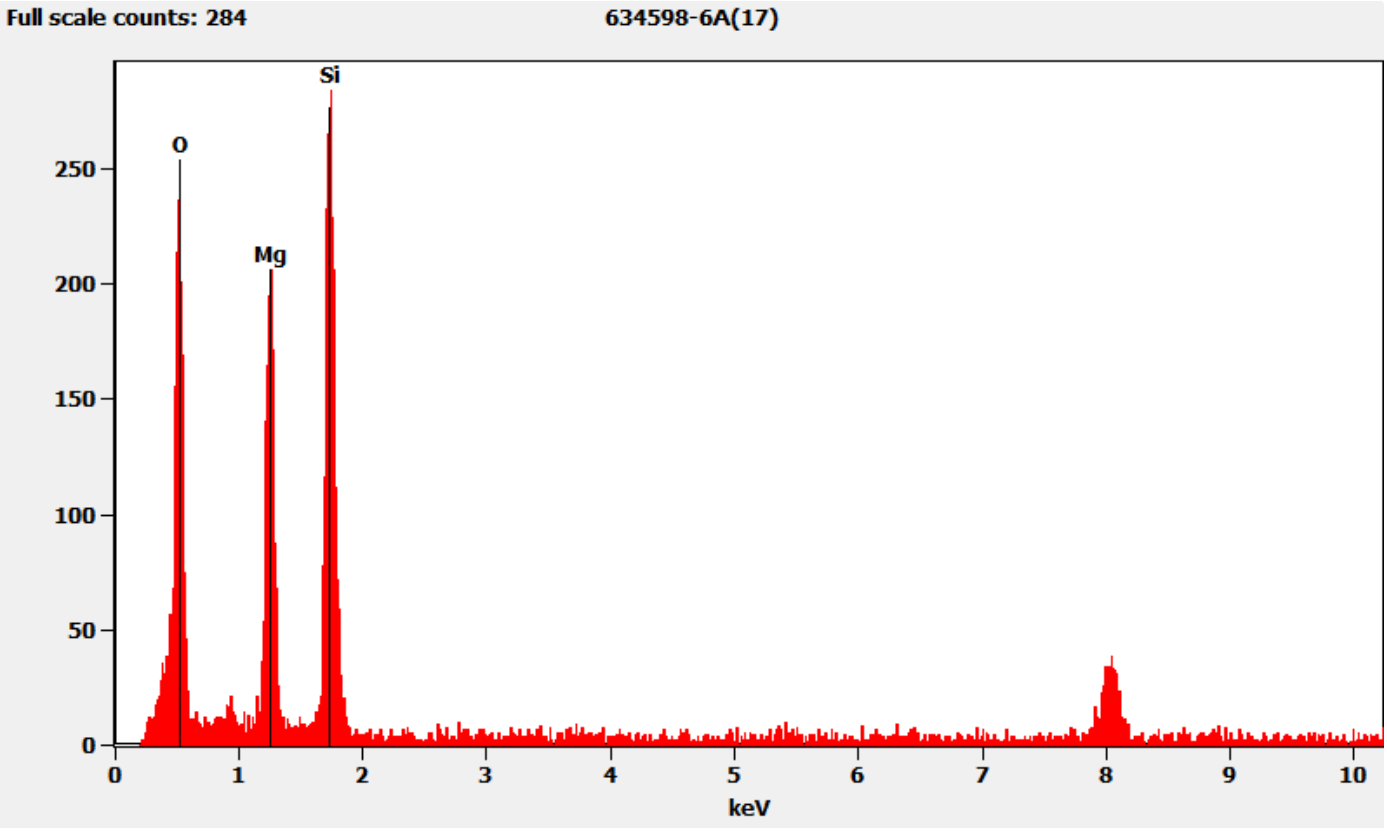


Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

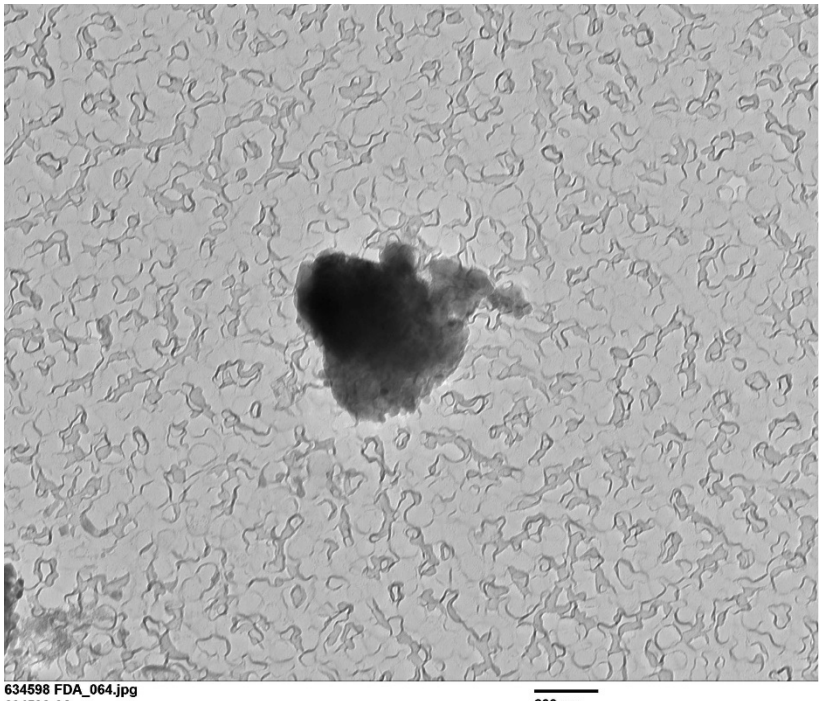
634598 FDA_065.jpg
634598-6A
Talc Fiber
14:46 4/18/202?
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-6A, Calcium Particle



634598 FDA_064.jpg
634598-6A
Ca Particle
Cal: 0.001030 µm/pix
14:33 4/18/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

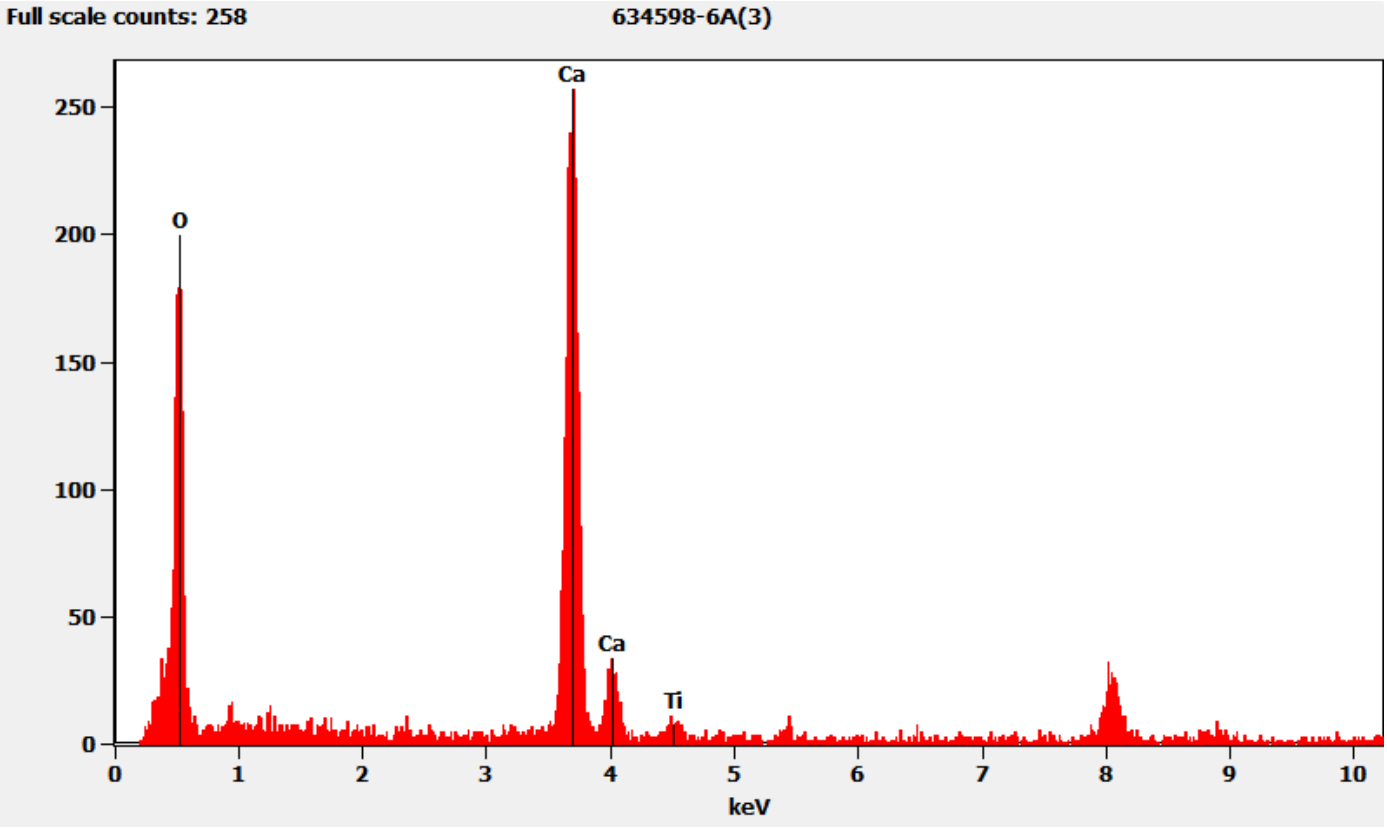
200 nm
HV=100kV
Direct Mag: 10000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Calcium Particle Pictured Above

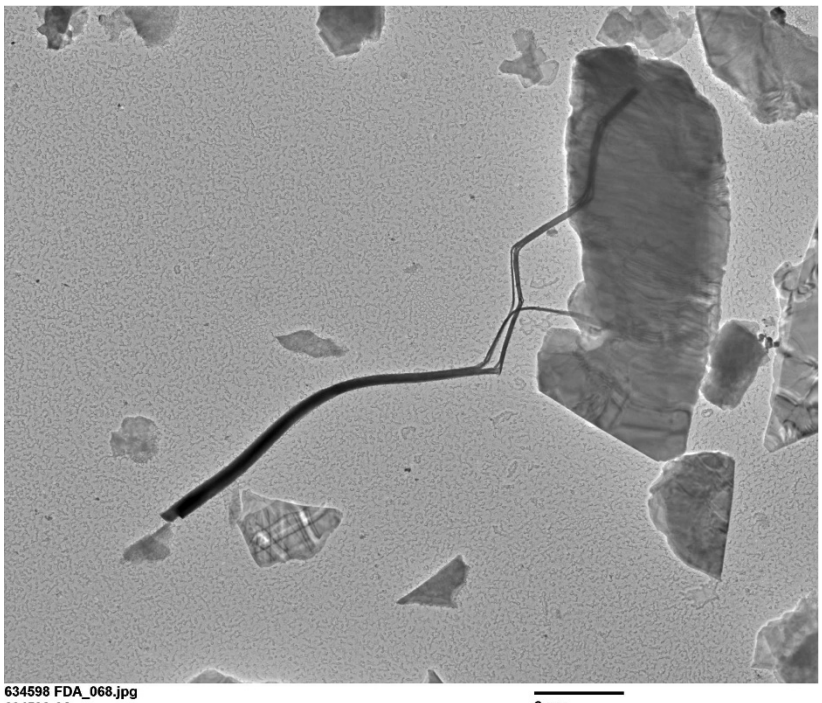
634598 FDA_063.jpg
634598-6A
Ca Particle
14:32 4/18/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

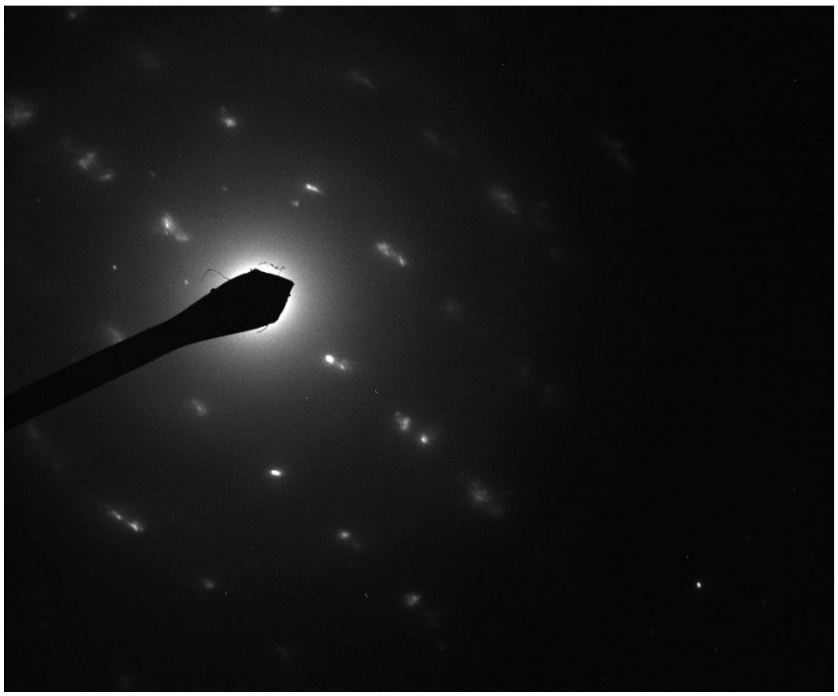
Chemistry from the Calcium Particle Pictured Above



634598-6A, Talc Ribbon



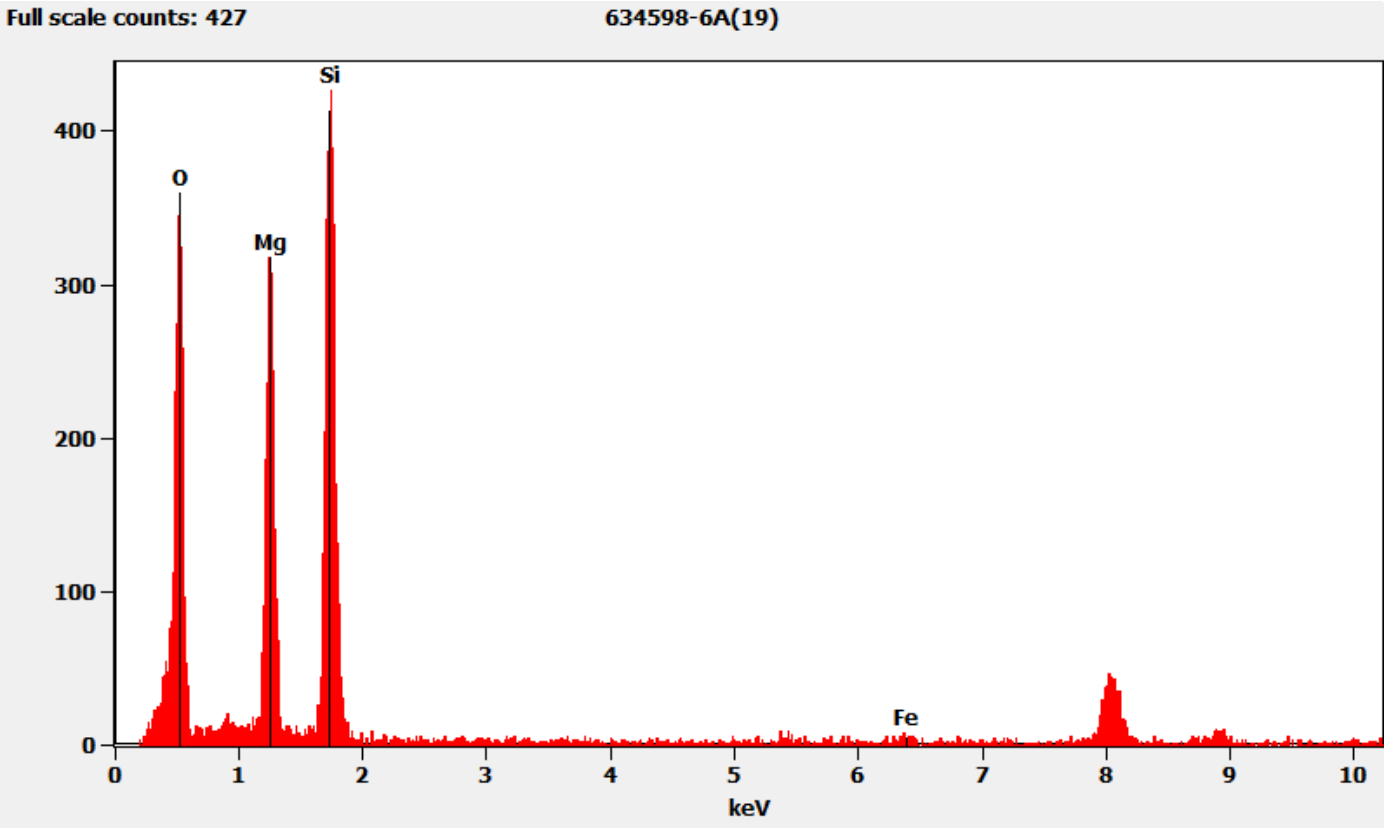
Diffraction Pattern from the Talc Ribbon Pictured Above



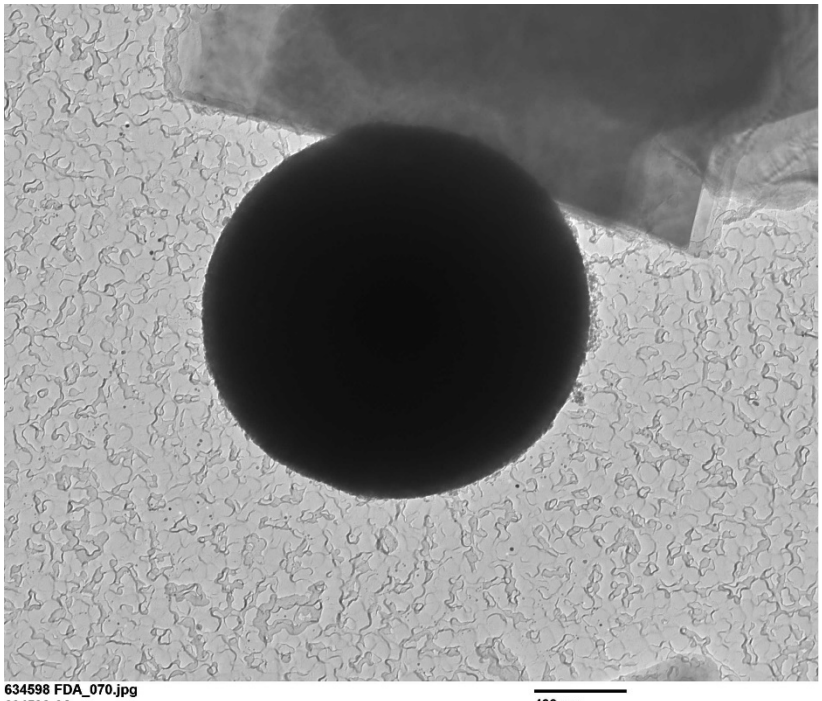
634598 FDA_067.jpg
634598-6A
Talc Ribbon
15:25 4/18/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



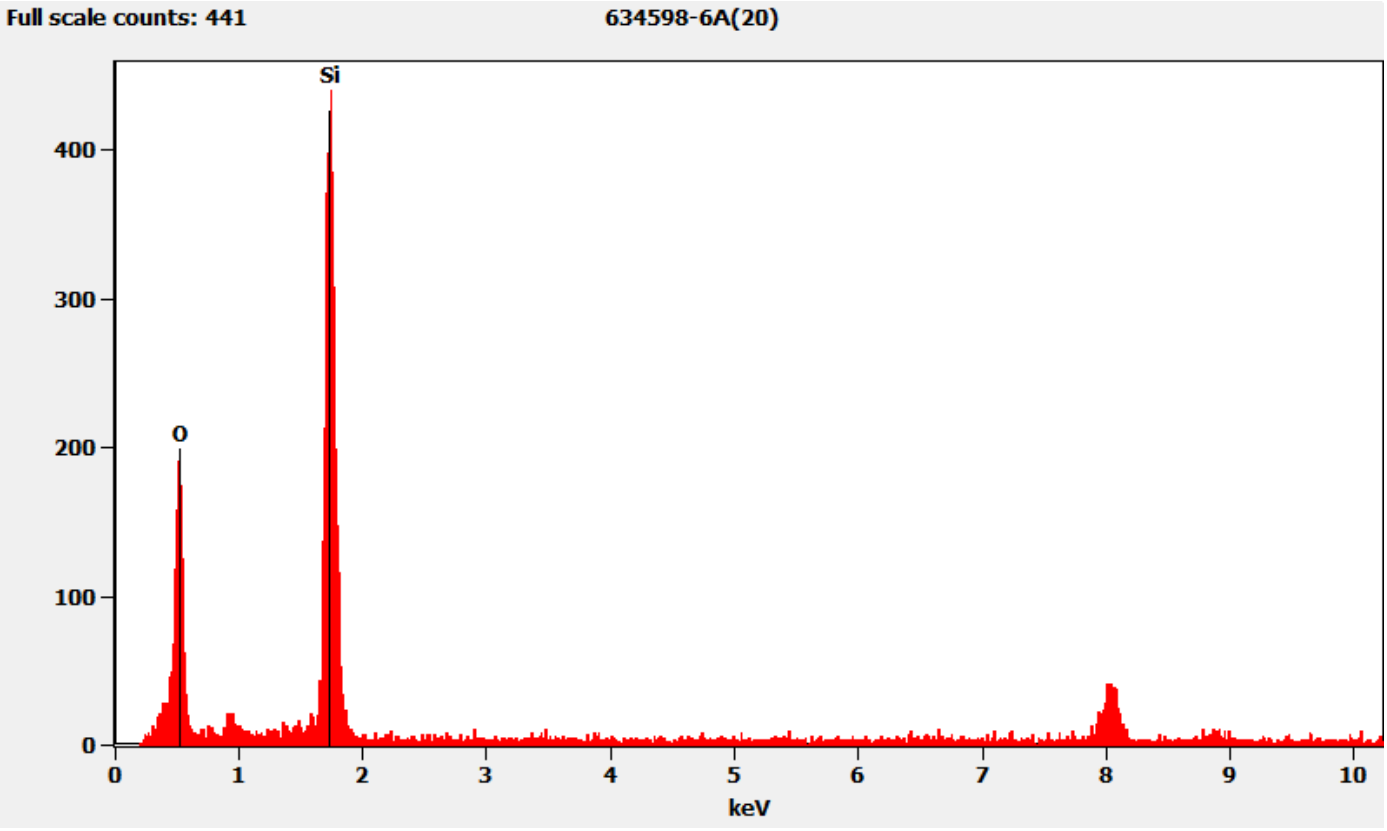
634598-6A, Silica Sphere



634598 FDA_070.jpg
634598-6A
Silica Sphere
Cal: 0.001430 µm/pix
15:51 4/18/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

400 nm
HV=100kV
Direct Mag: 7200 x
AMA Analytical Services, Inc

Chemistry from the Silica Sphere Pictured Above



634598-7A, 7B, 7C/Client Sample: 03022022-7

PLM

All three aliquots of sample 03022022-7 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-7A	No Asbestos Detected
634598-7B	No Asbestos Detected
634598-7C	No Asbestos Detected

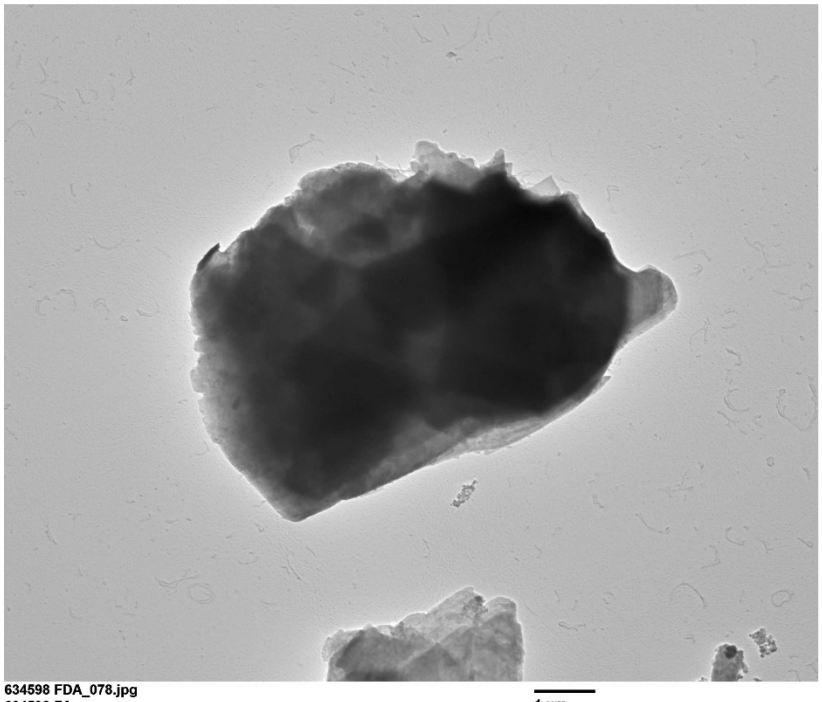
TEM

(b) (6) analyzed aliquots 7A, 7B, and 7C on April 19, 2022. The primary particles observed were talc, mica, and silica spheres; iron, silicon, and calcium particles were also observed along with talc ribbons, elongated talc particles, and elongated titanium 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.

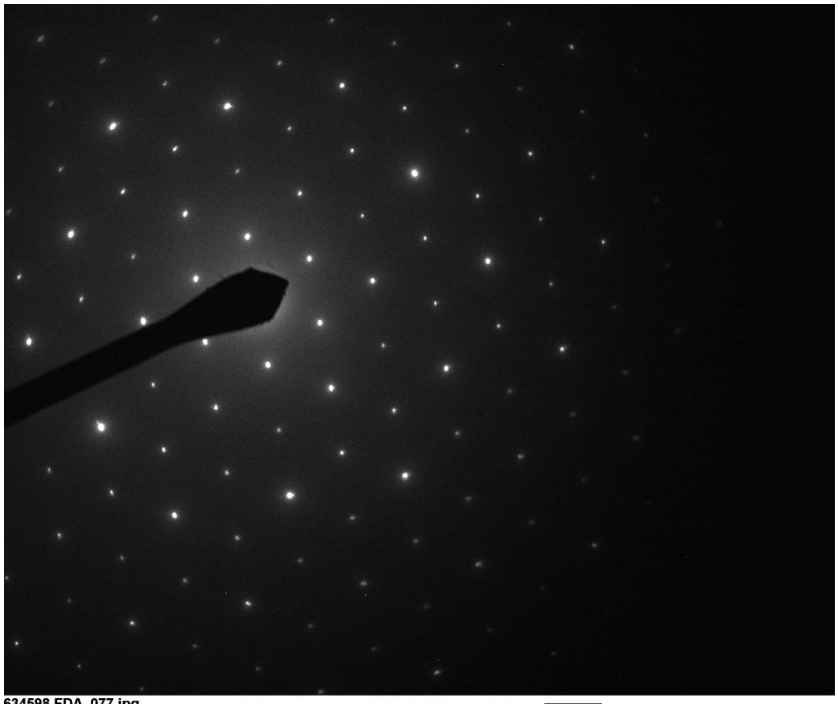
634598-7A	No Asbestos Detected
634598-7B	No Asbestos Detected
634598-7C	No Asbestos Detected

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.

634598-7A, Talc Particle



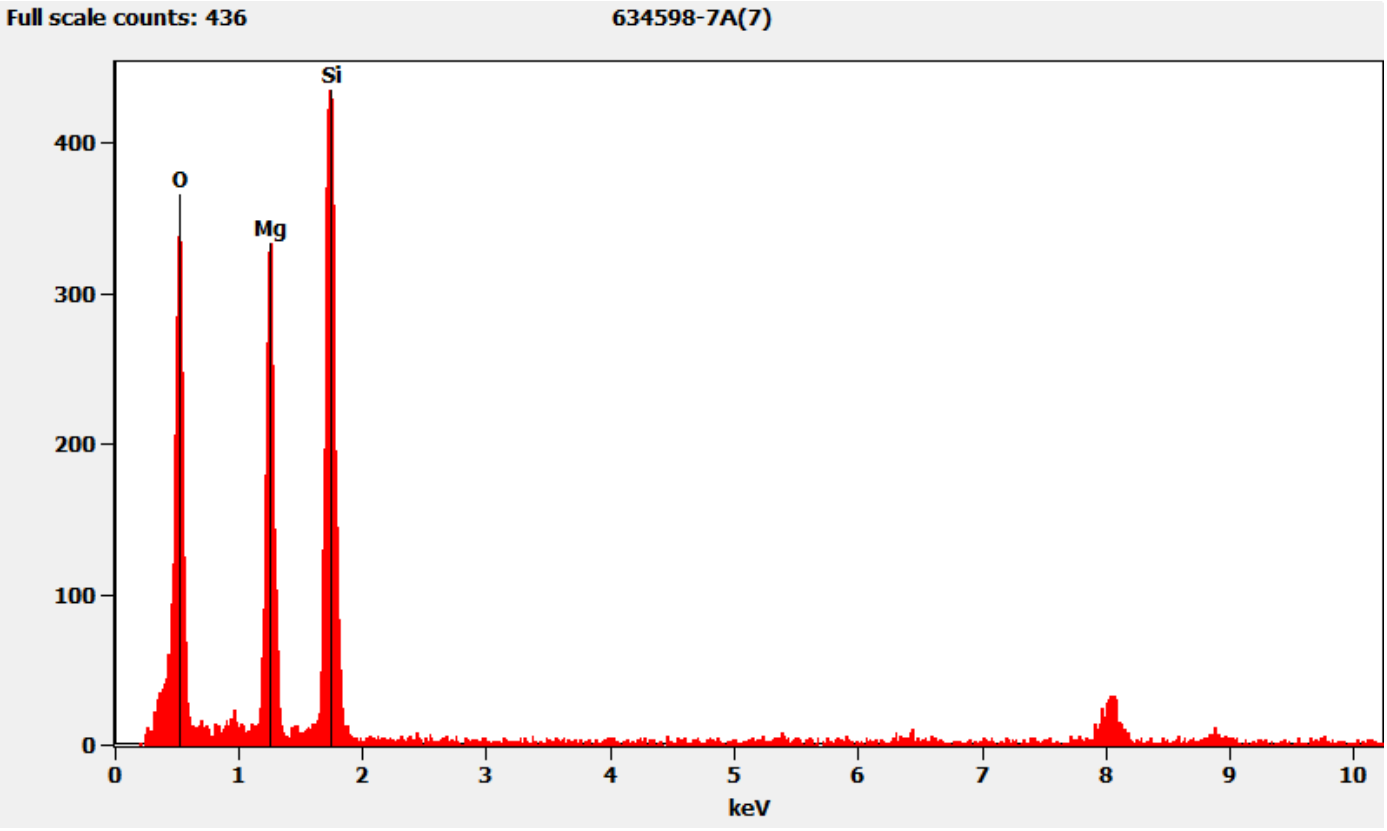
Hexagonal Diffraction Pattern from the Talc Particle Pictured Above



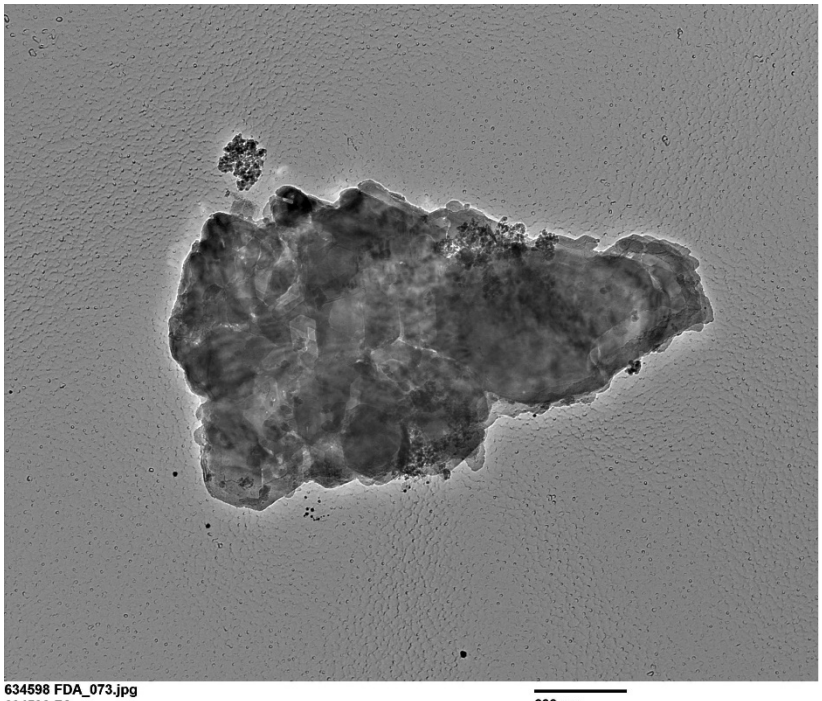
634598 FDA_077.jpg
634598-7A
Talc Particle
13:49 4/19/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-7A, Mica Particle



634598 FDA_073.jpg
634598-7A
Mica Particle
Cal: 0.002145 µm/pix
13:39 4/19/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

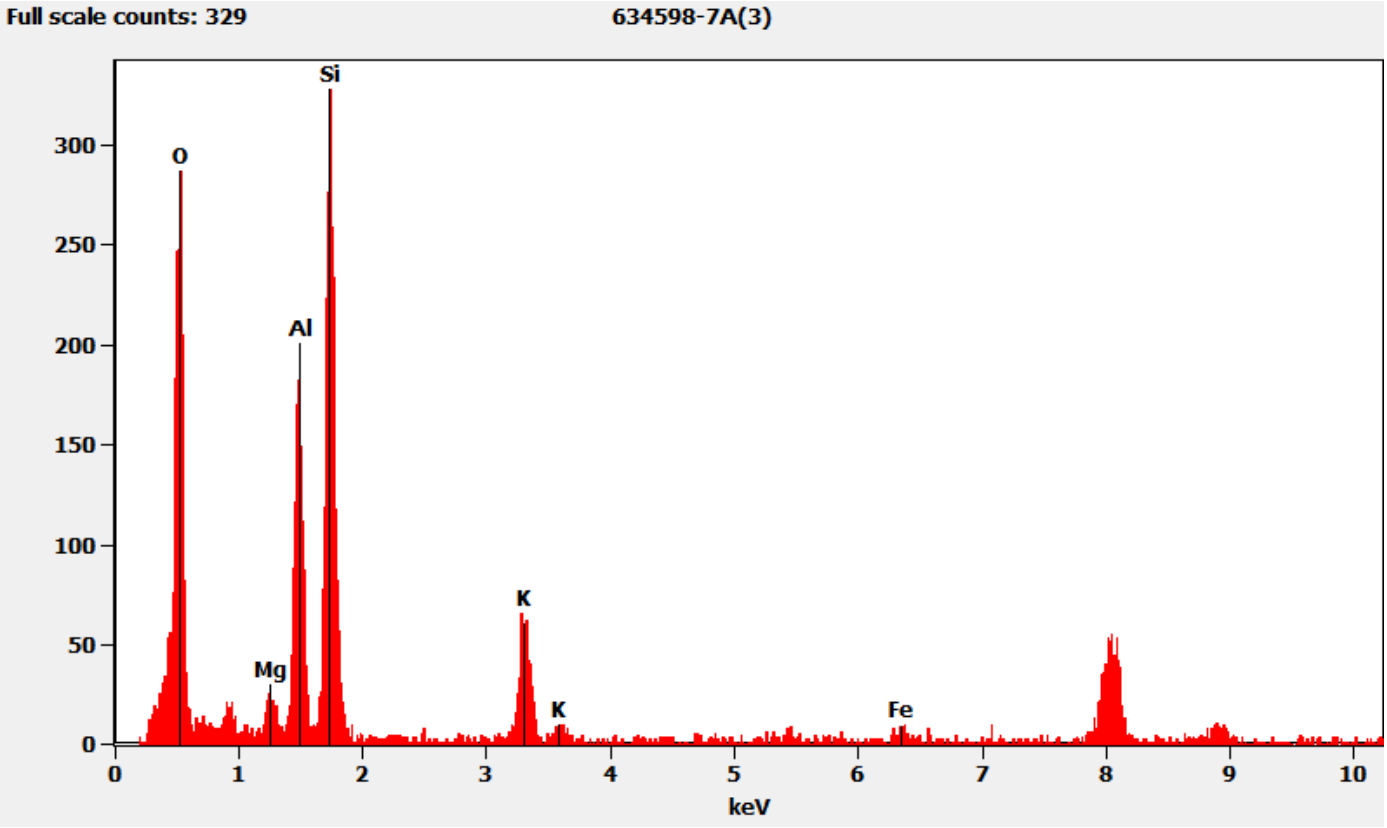
600 nm
HV=100kV
Direct Mag: 4800 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

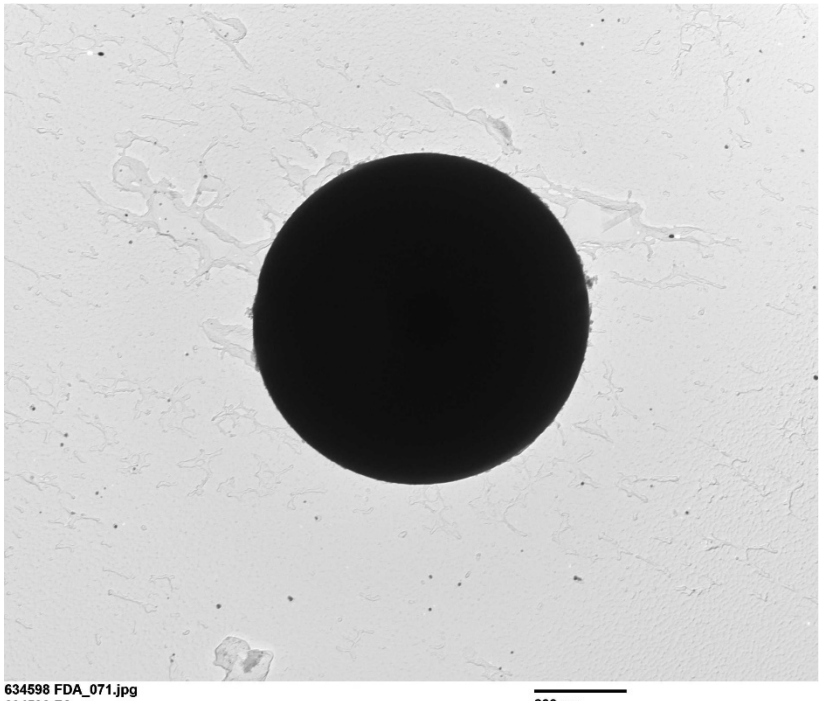
634598 FDA_072.jpg
634598-7A
Mica Particle
13:37 4/19/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

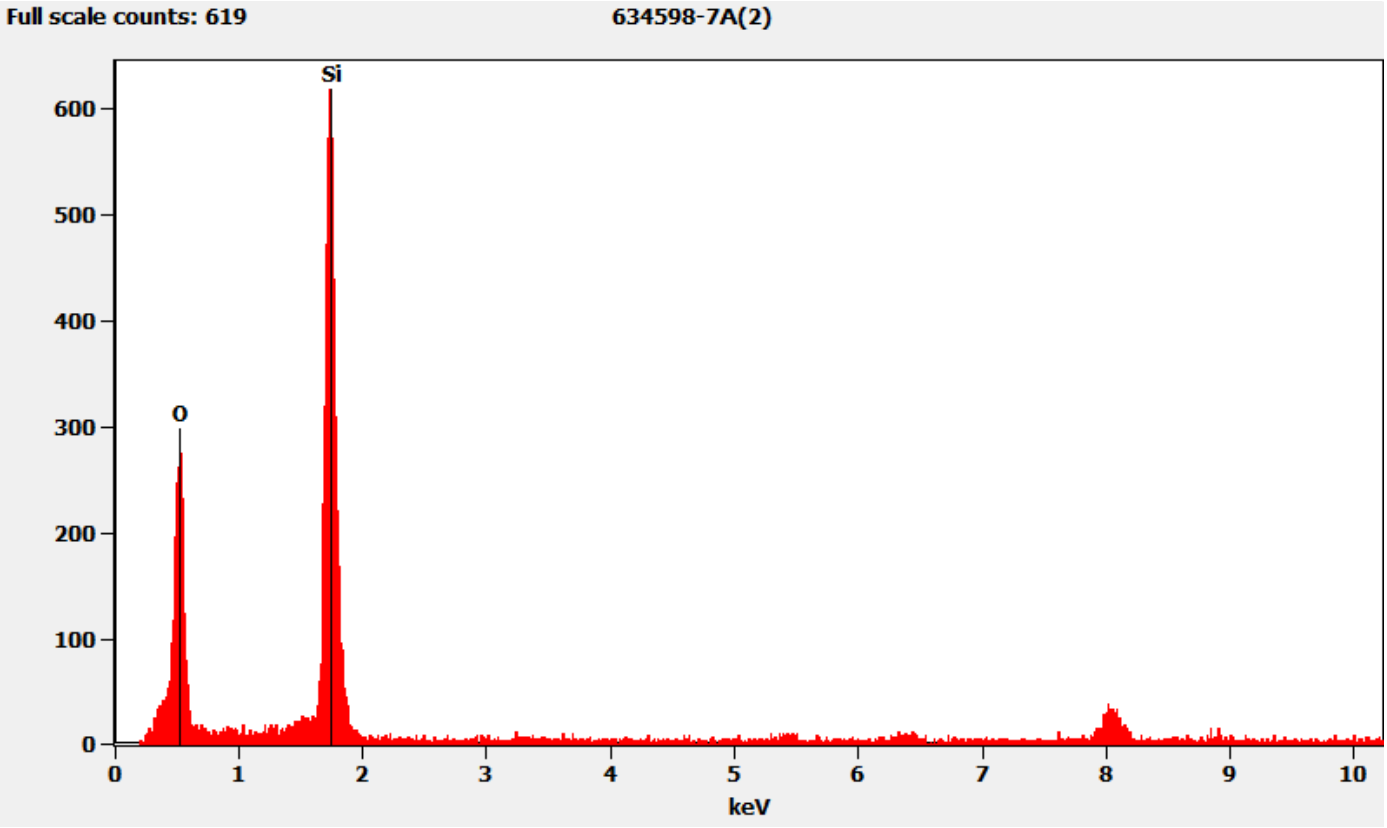
Chemistry from the Mica Particle Pictured Above



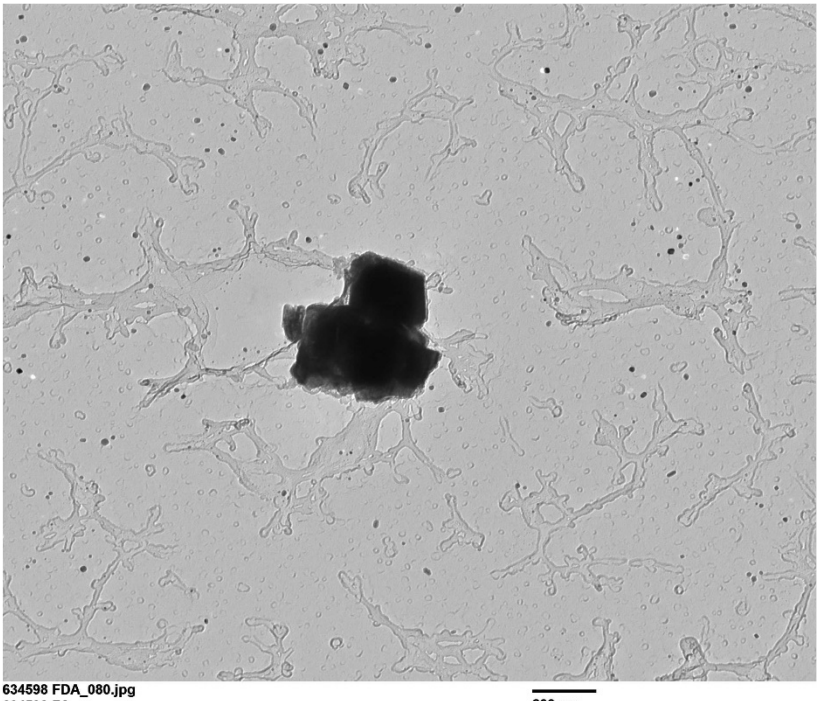
634598-7A, Silica Sphere



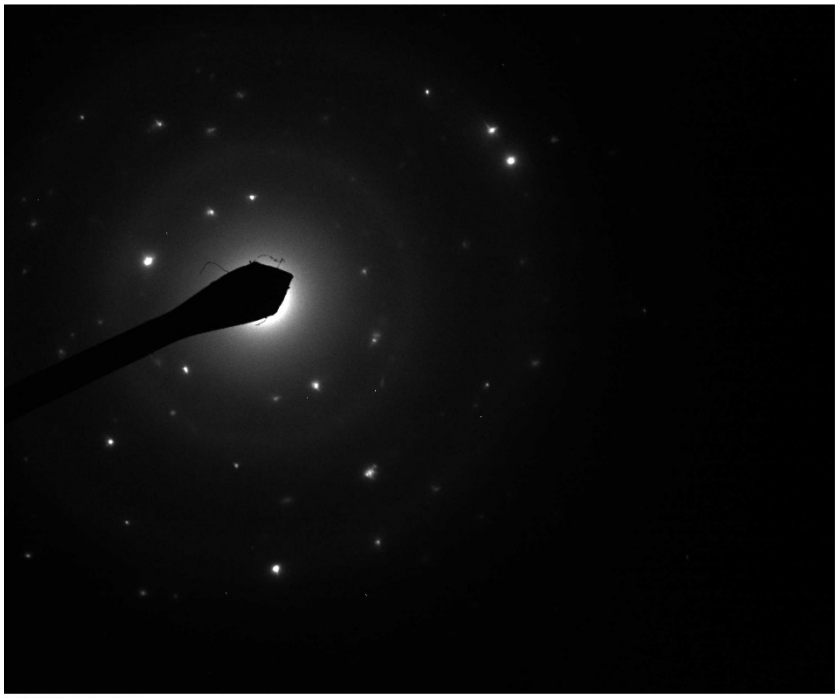
Chemistry from the Silica Sphere Pictured Above



634598-7A, Iron Particle



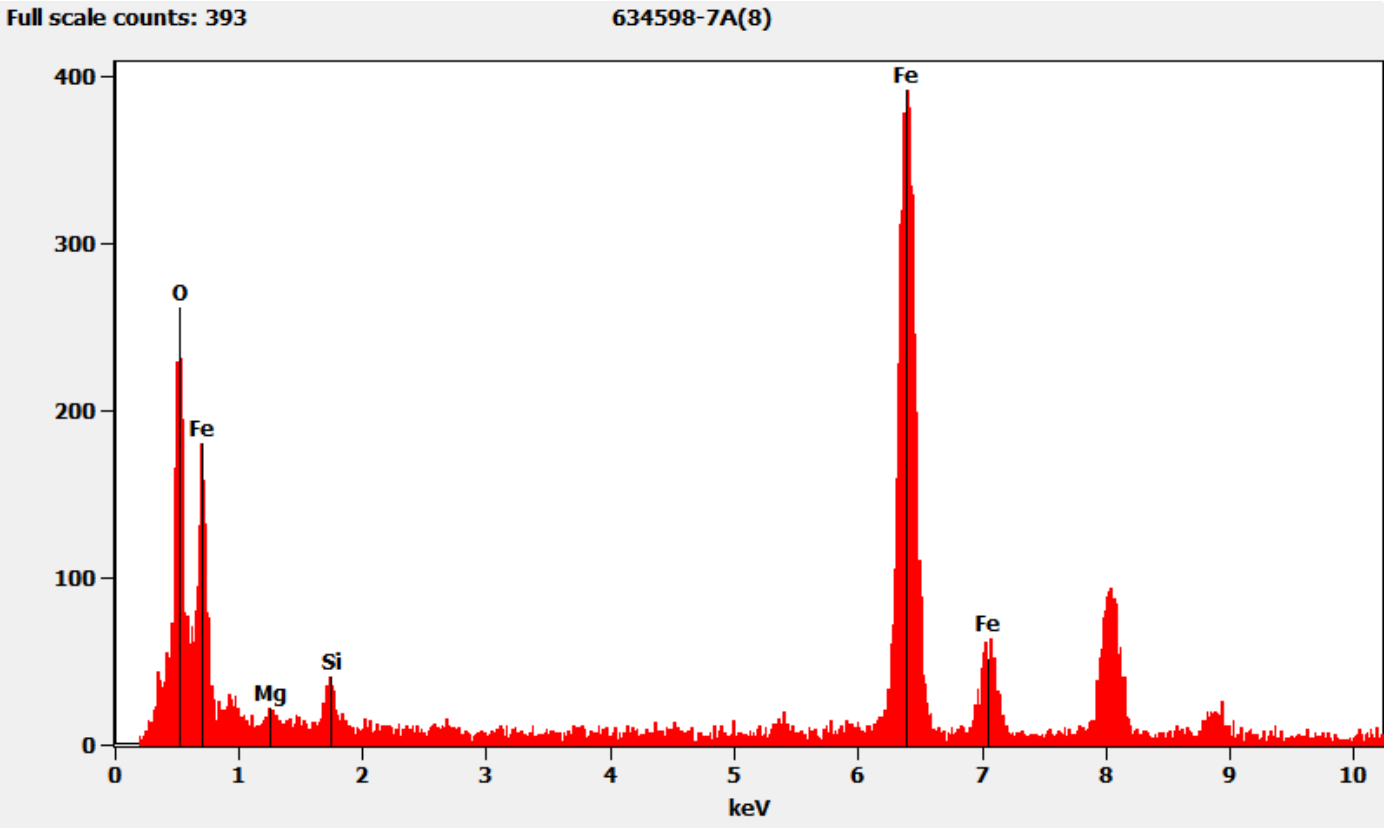
Diffraction Pattern from the Iron Particle Pictured Above



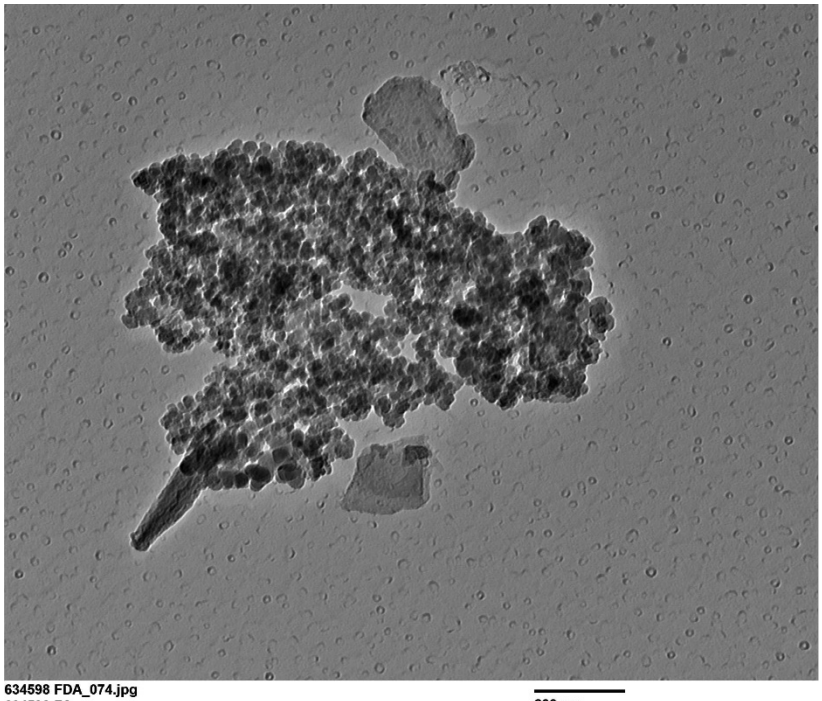
634598 FDA_079.jpg
634598-7A
Iron Particle
13:52 4/19/2022
Microscopist (b) (6)
Camera: NANOSCAN 1K, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Iron Particle Pictured Above



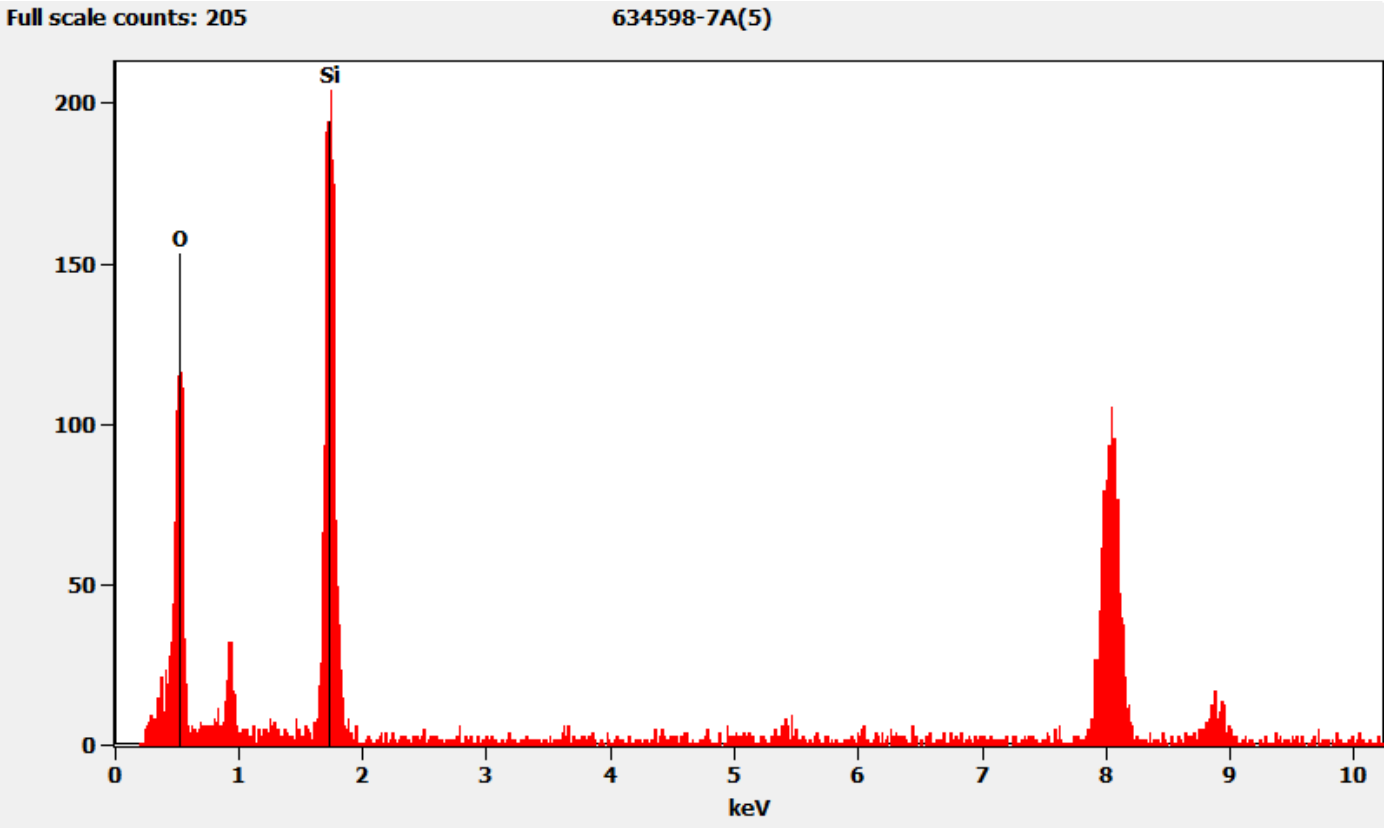
634598-7A, Silicon Particle



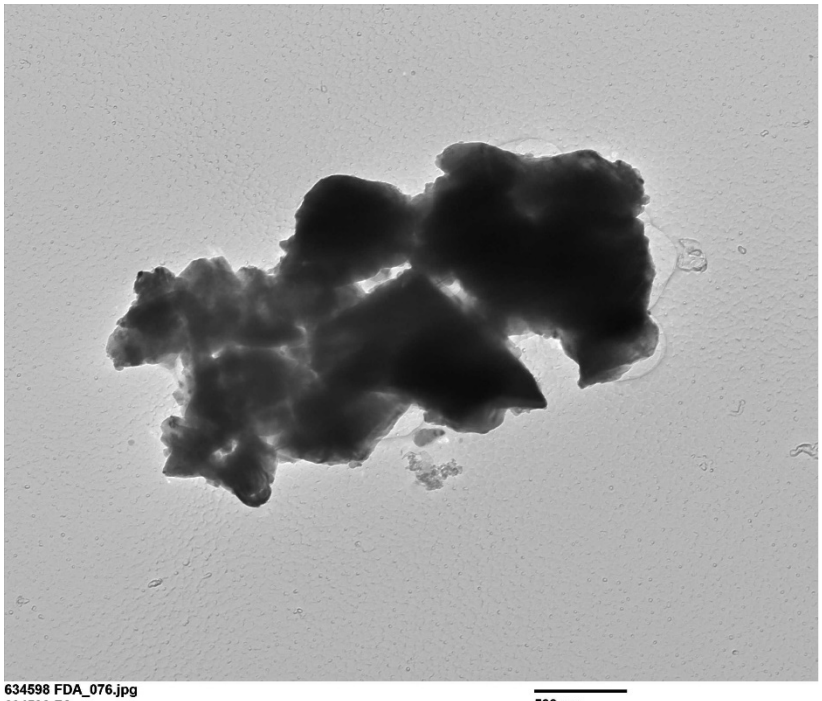
634598 FDA_074.jpg
634598-7A
Silica Particles
Cal: 0.726816 nm/pix
13:43 4/19/202[illegible]
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=100kV
Direct Mag: 14000 x
AMA Analytical Services, Inc

Chemistry from the Silicon Particle Pictured Above



634598-7A, Calcium Particle



634598 FDA_076.jpg
634598-7A
Calcium Particles
Cal: 0.001775 µm/pix
13:45 4/19/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

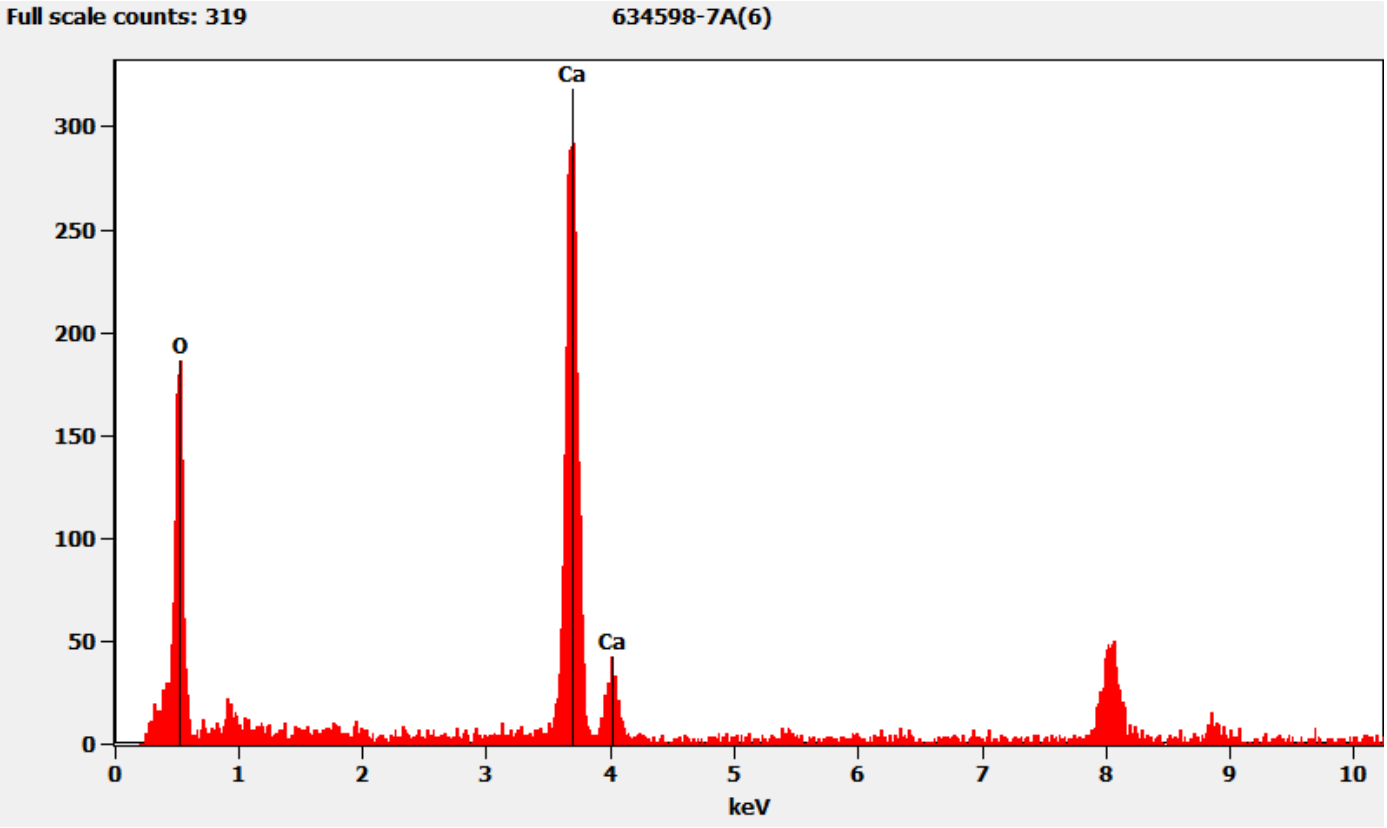
500 nm
HV=100kV
Direct Mag: 5800 x
AMA Analytical Services, Inc

Diffraction Pattern from the Calcium Particle Pictured Above

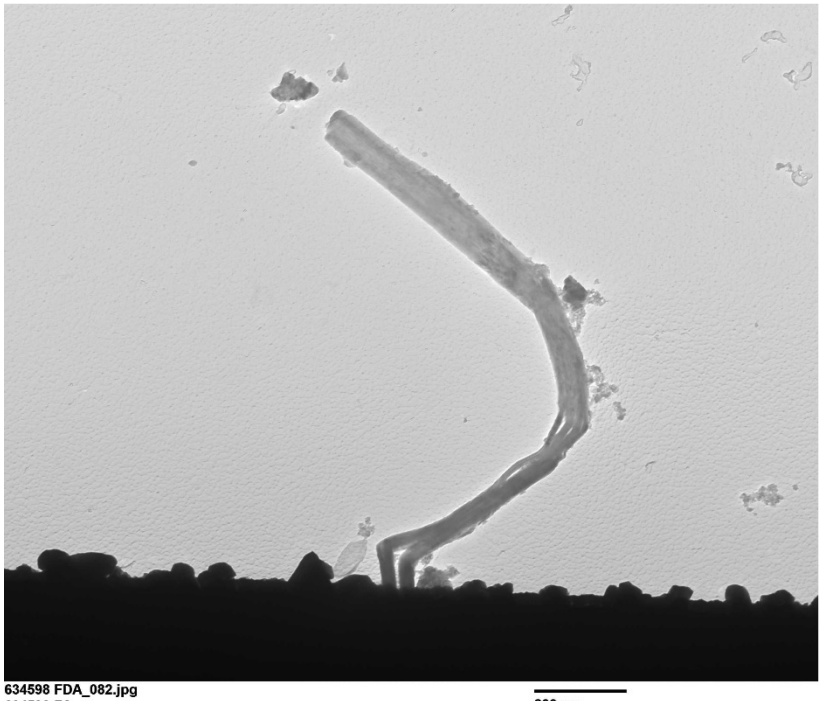
634598 FDA_075.jpg
634598-7A
Calcium Particles
13:44 4/19/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Calcium Particle Pictured Above



634598-7A, Talc Ribbon

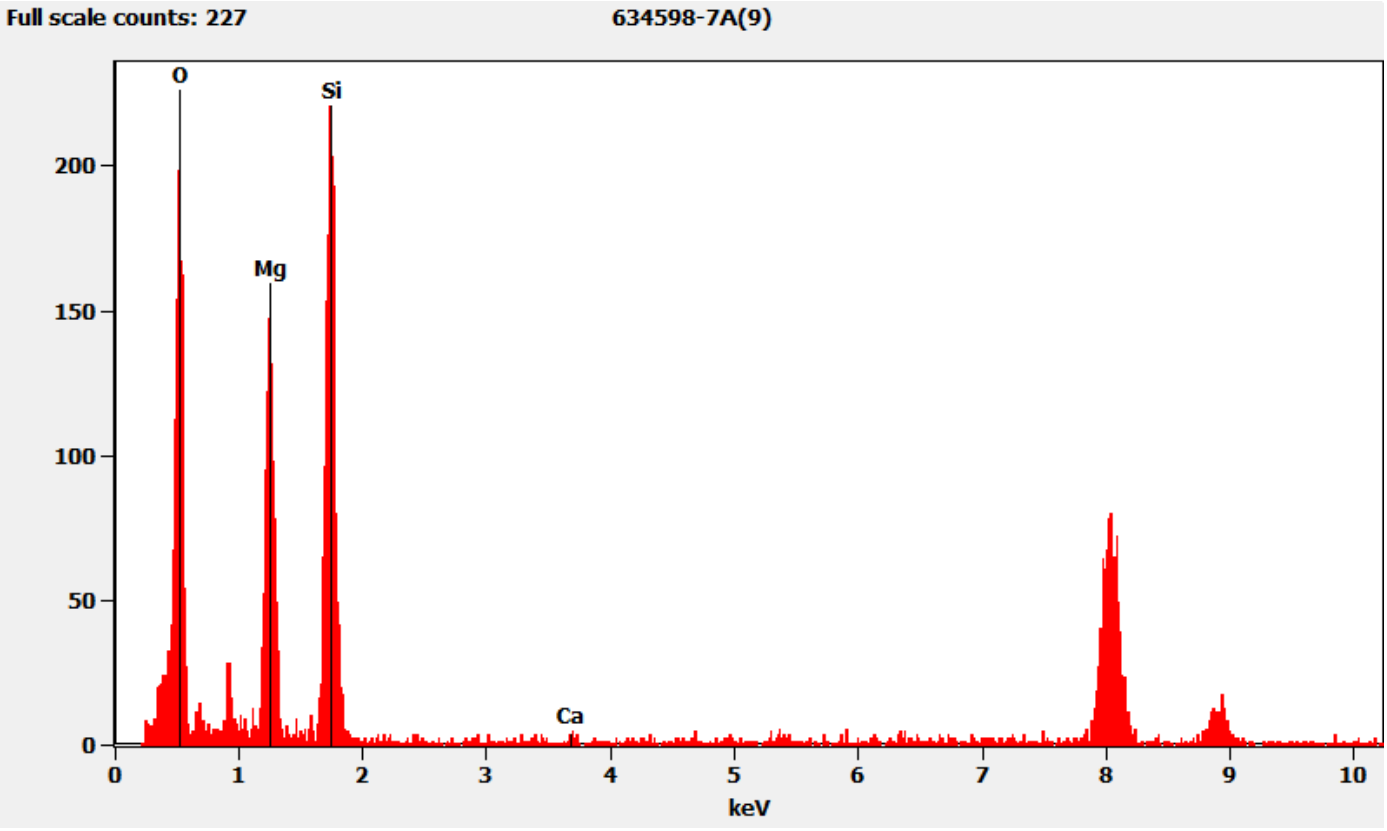


Diffraction Pattern from the Talc Ribbon Pictured Above

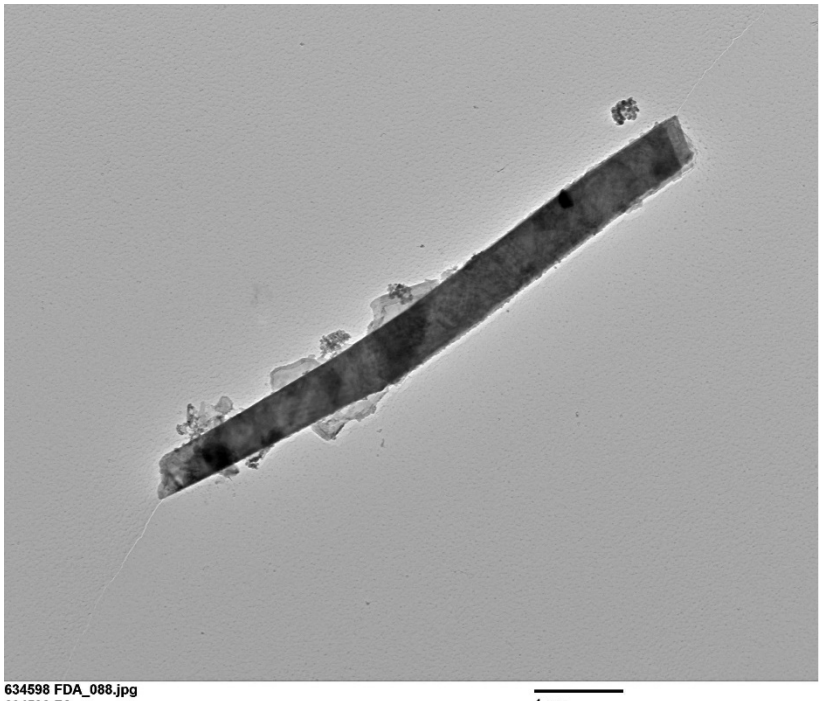
634598 FDA_081.jpg
634598-7A
Talc Ribbon
13:56 4/19/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-7A, Elongated Talc Particle



634598 FDA_088.jpg
634598-7A
Talc Fiber
Cal: 0.003702 µm/pix
14:19 4/19/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

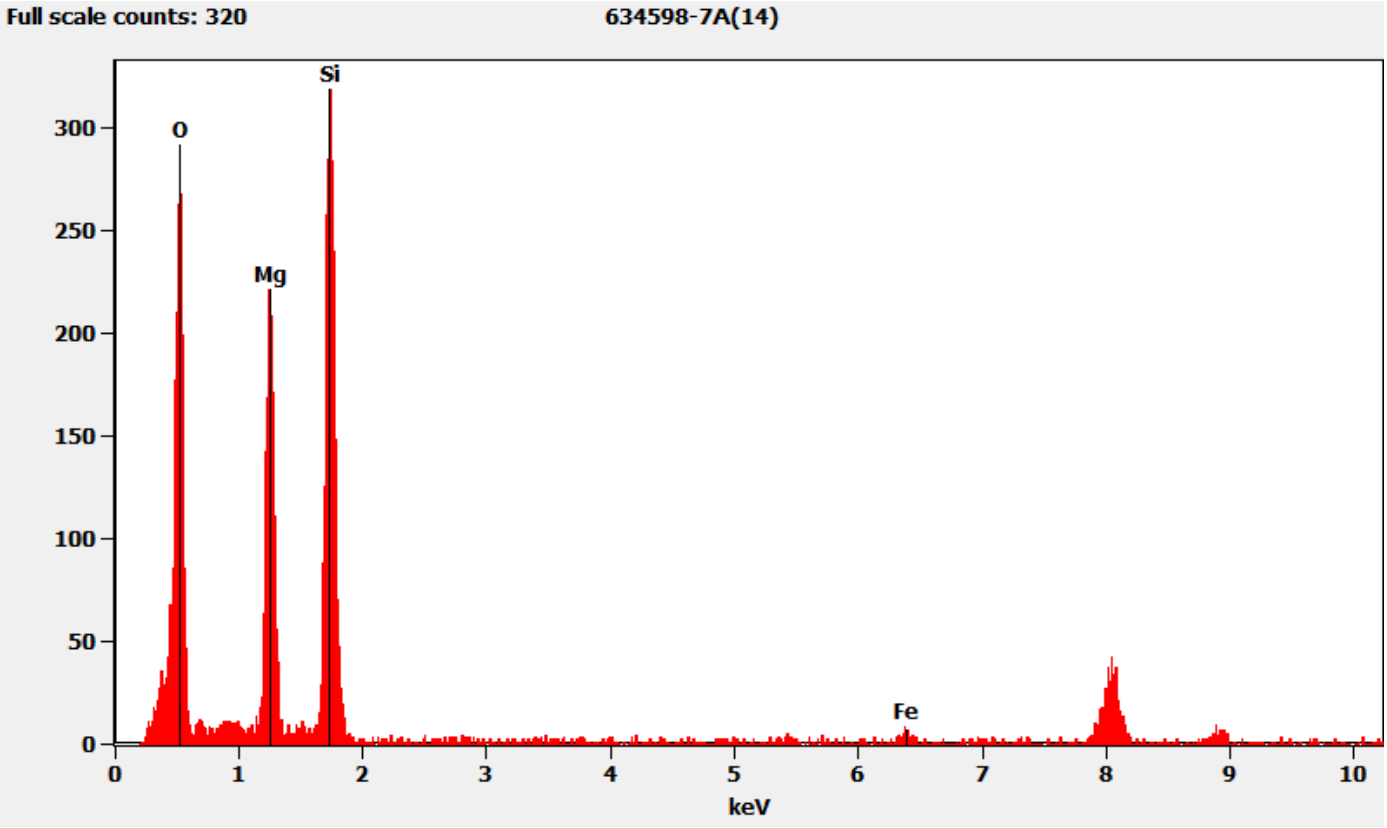
1 µm
HV=100kV
Direct Mag: 2900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

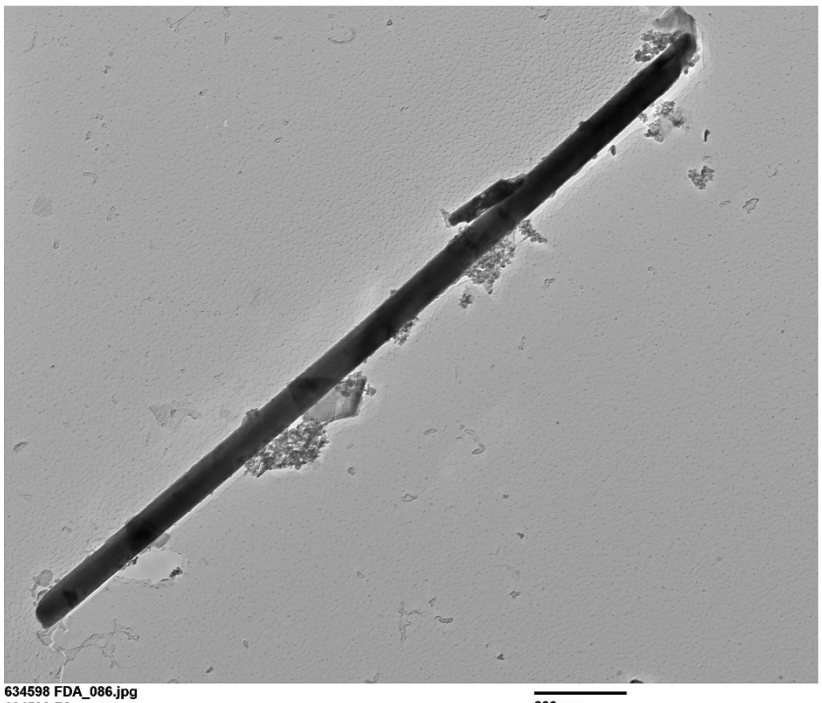
634598 FDA_087.jpg
634598-7A
Talc Fiber
14:18 4/19/202[illegible]
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

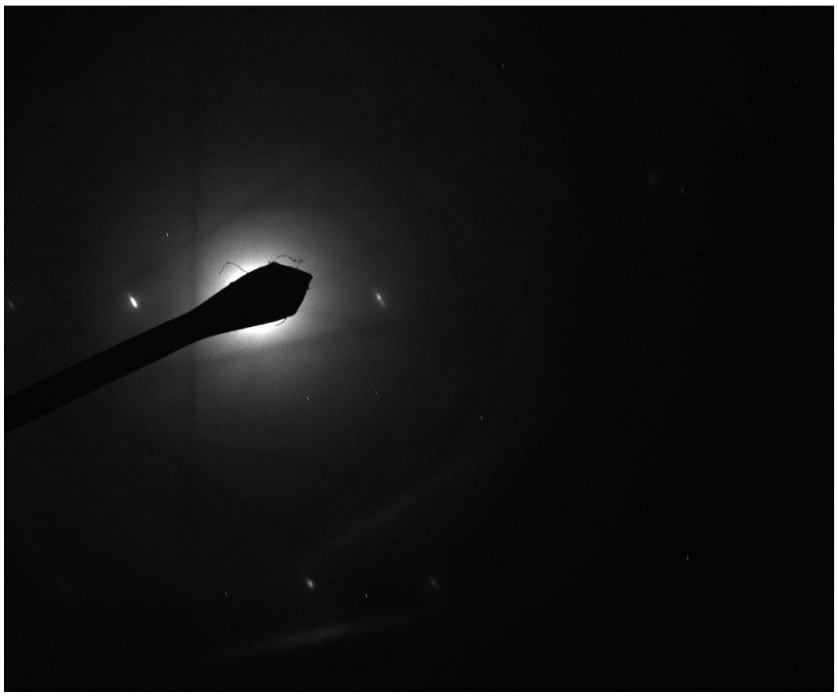
Chemistry from the Elongated Talc Particle Pictured Above



34598-7A, Titanium Fiber



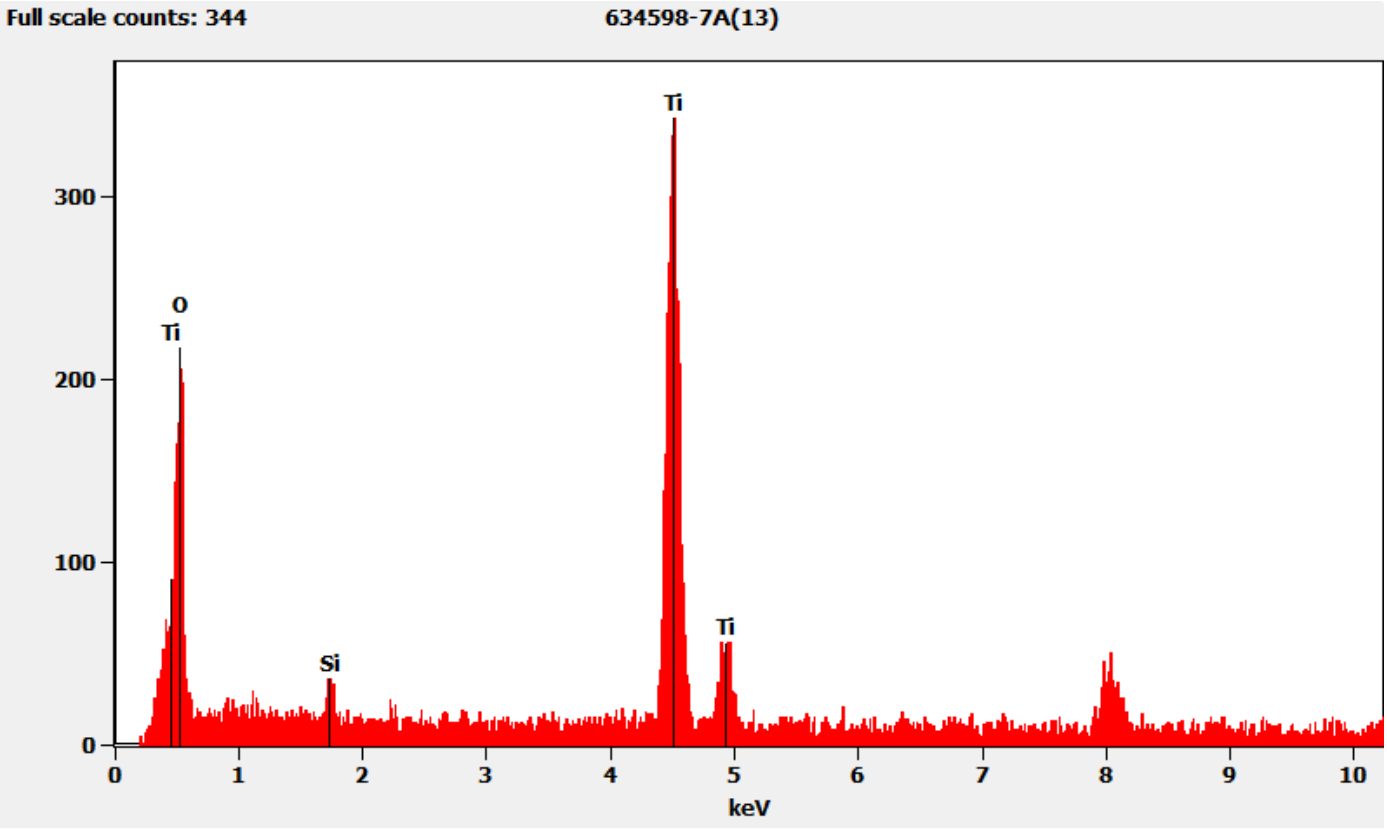
Diffraction Pattern from the Titanium Fiber Pictured Above



634598 FDA_085.jpg
634598-7A
Ti Fiber
14:14 4/19/2022
Microscopist (b) (6)
Camera: NAN... ...75, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Titanium Fiber Pictured Above



634598-8A, 8B, 8C/Client Sample: 03022022-8

PLM

All three aliquots of sample 03022022-8 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-8A	No Asbestos Detected
634598-8B	No Asbestos Detected
634598-8C	No Asbestos Detected

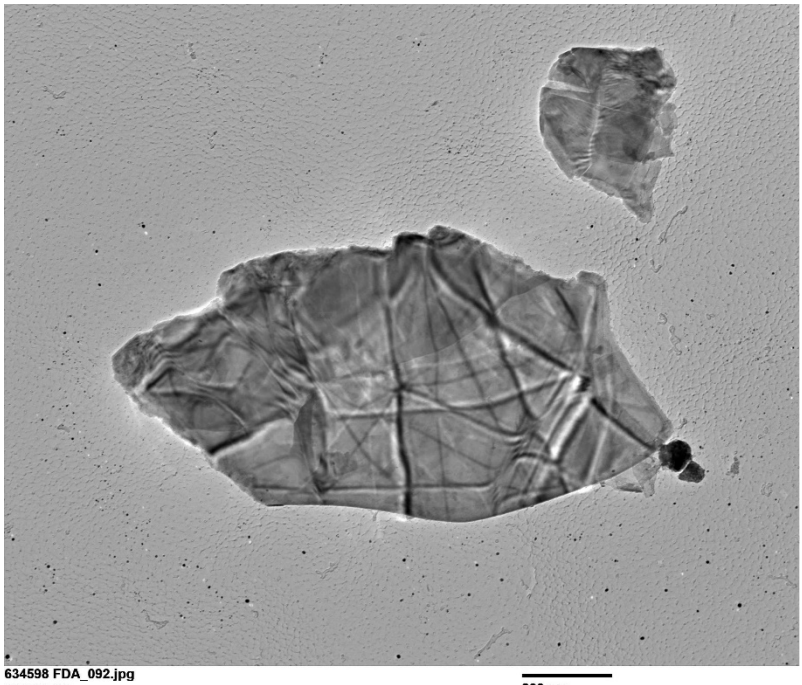
TEM

(b) (6) analyzed aliquot 8A on April 20, 2022, aliquot 8B on April 22, 2022, and aliquot 8C on April 21, 2022. The primary particle observed was mica; talc particles and silica spheres were also observed along with particles containing sodium, aluminum, silicon, and sulfur, silicon particles, chromium particles, titanium particles, talc ribbons, and elongated 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.

634598-8A	No Asbestos Detected
634598-8B	No Asbestos Detected
634598-8C	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.

634598-8A, Mica Particle

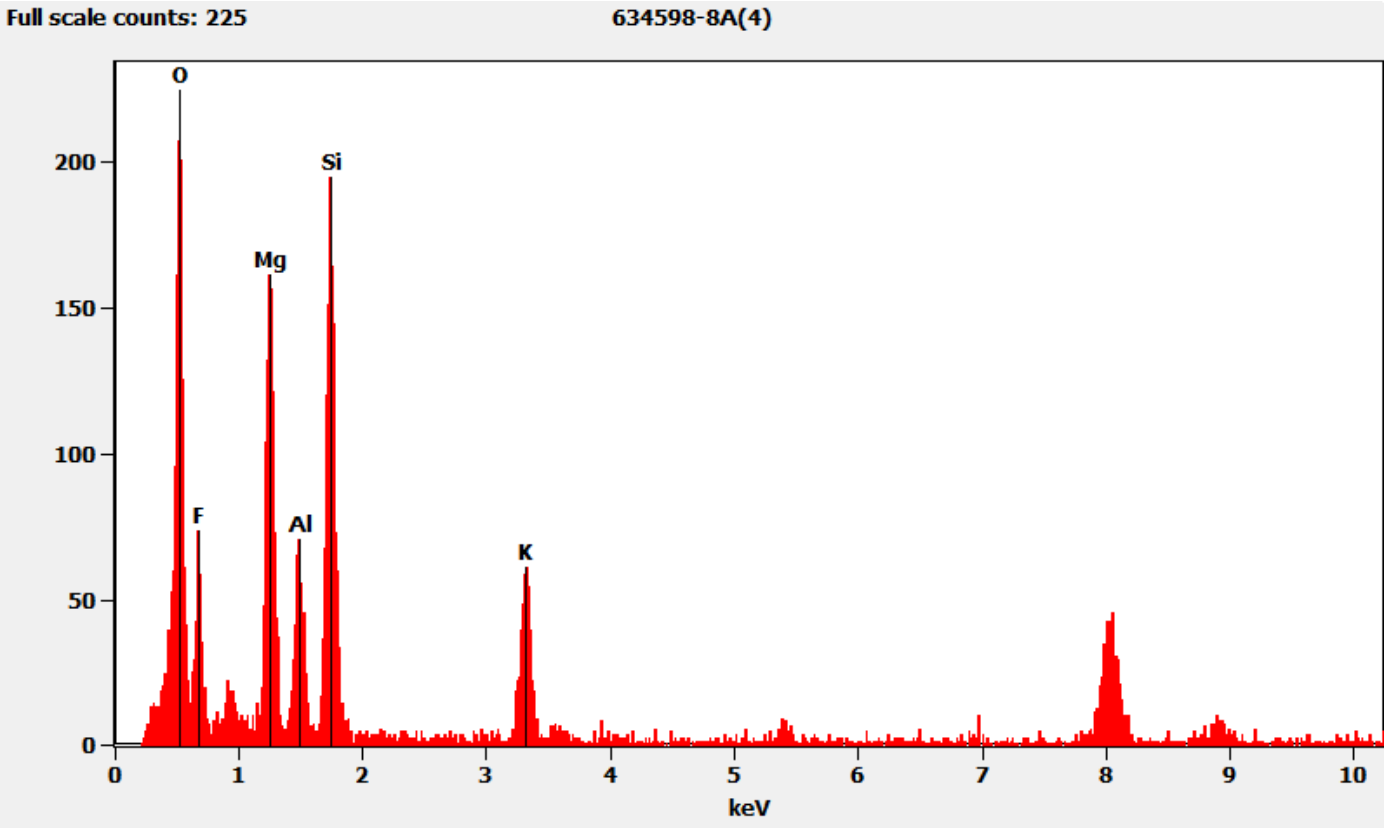


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

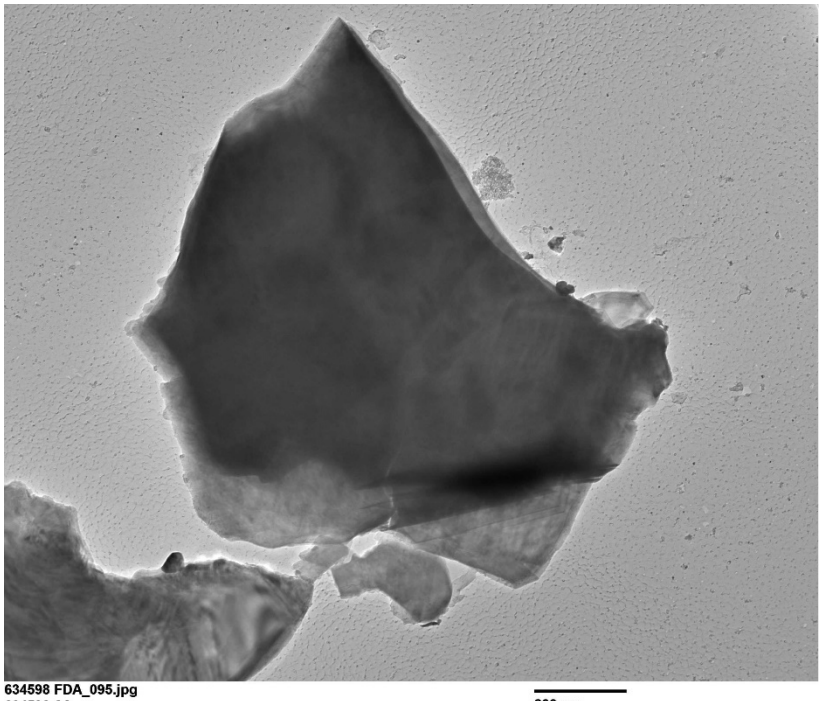
634598 FDA_091.jpg
634598-8A
Mica Particle
11:12 4/20/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle Pictured Above



634598-8A, Talc Particle



634598 FDA_095.jpg
634598-8A
Talc Particle
Cal: 0.002860 µm/pix
11:20 4/20/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

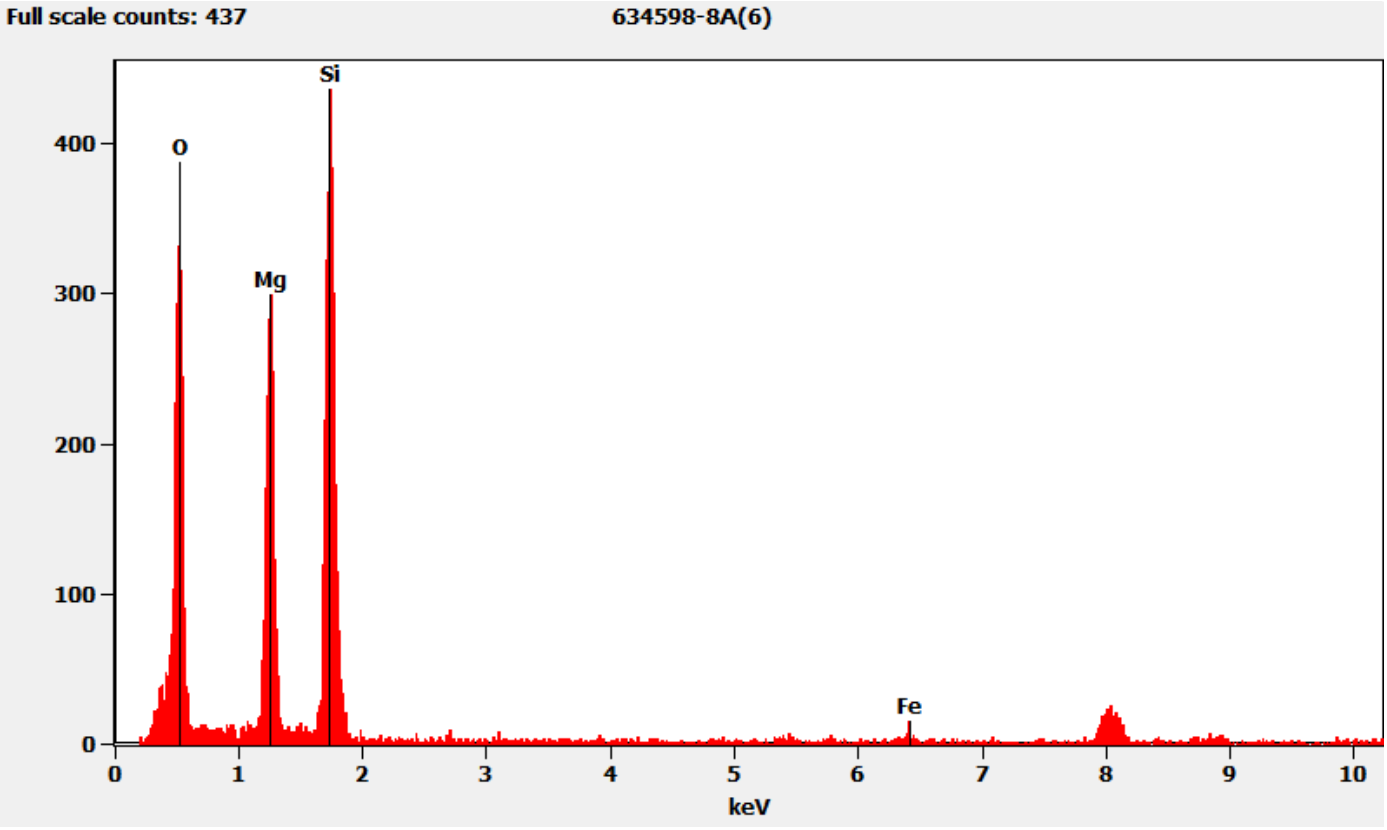
800 nm
HV=100kV
Direct Mag: 3600 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

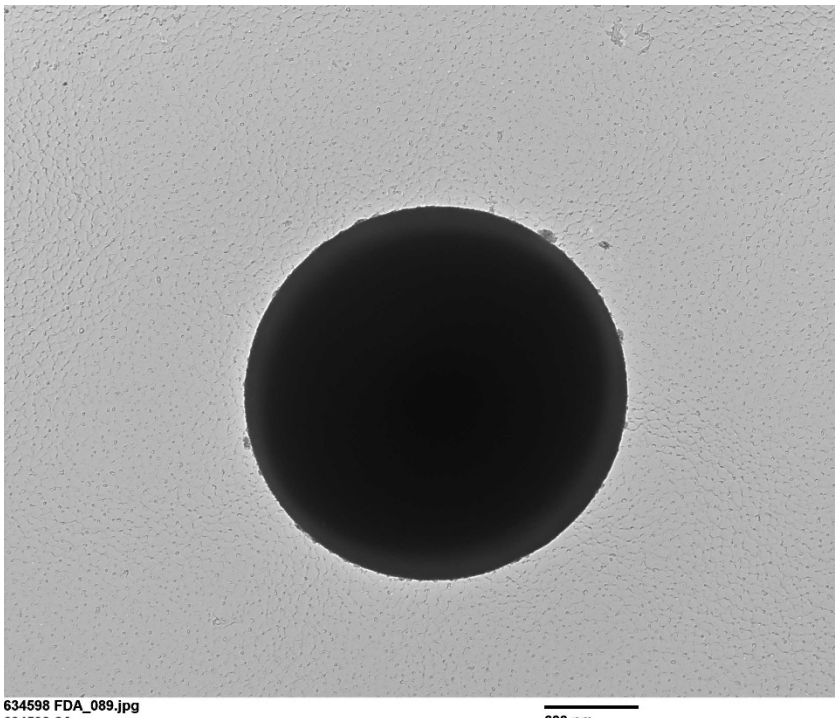
634598 FDA_094.jpg
634598-8A
Talc Particle
11:18 4/20/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

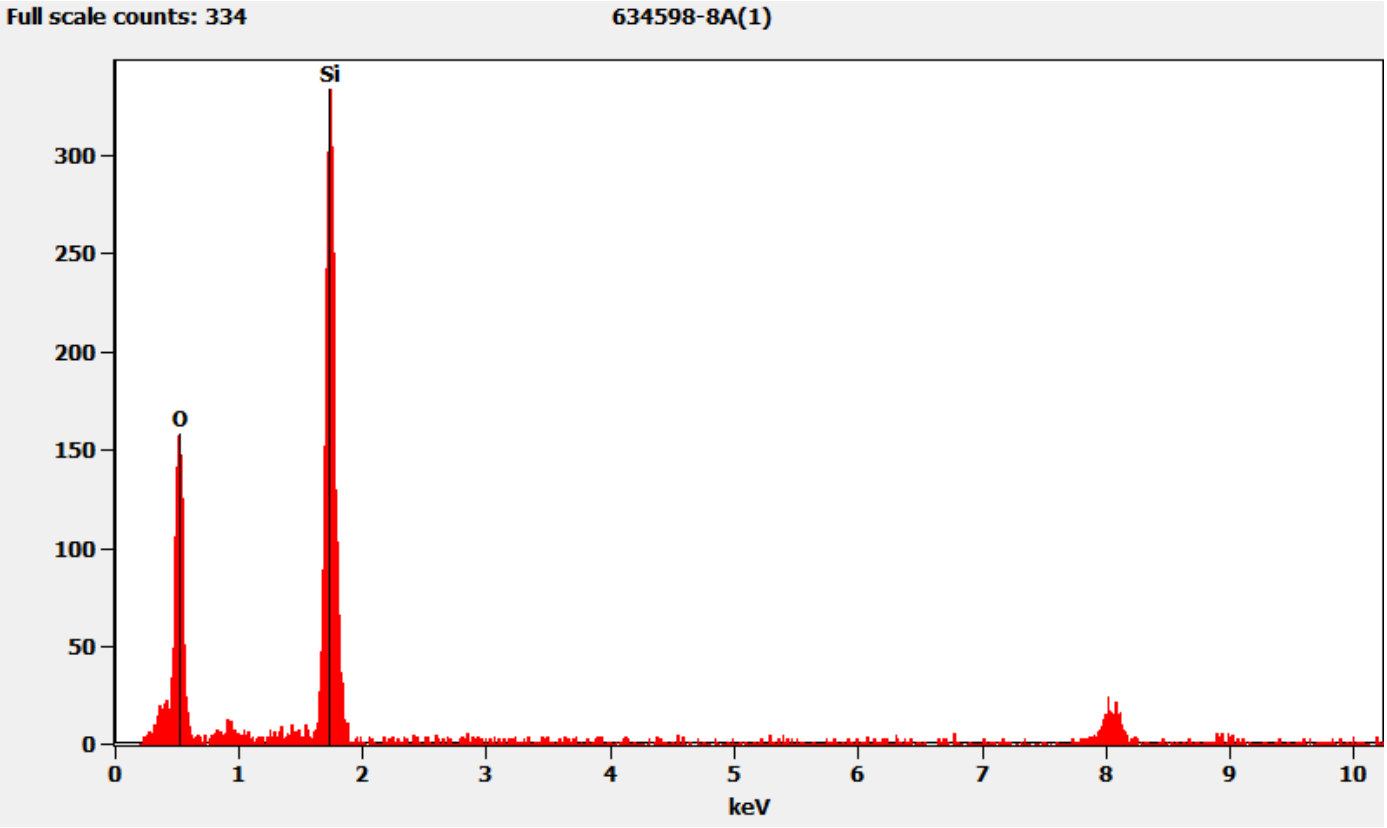
Chemistry from the Talc Particle Pictured Above



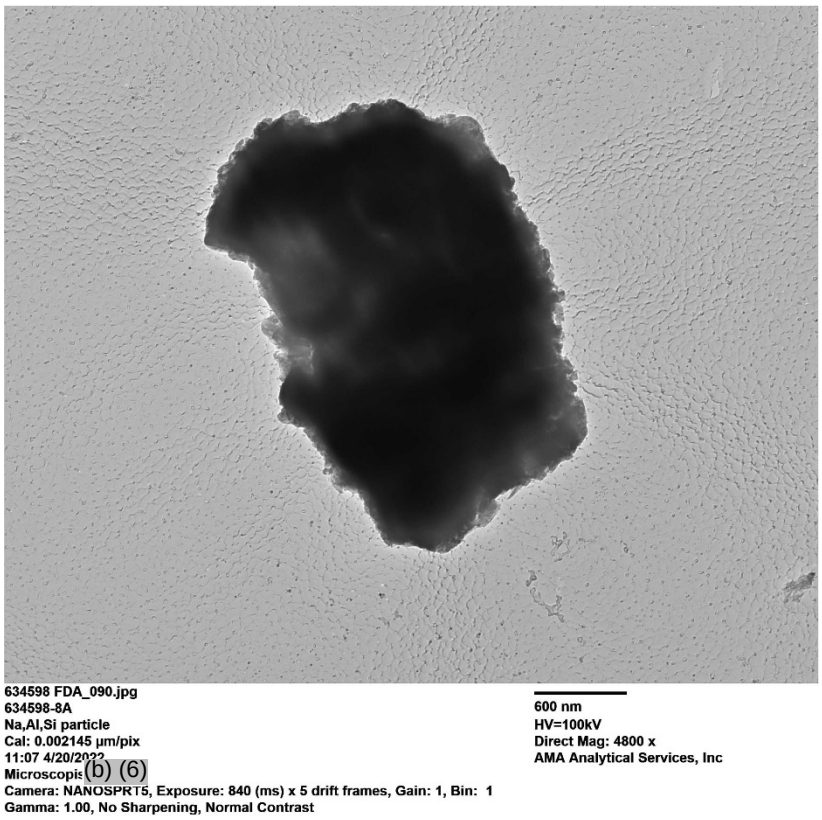
634598-8A, Silica Sphere



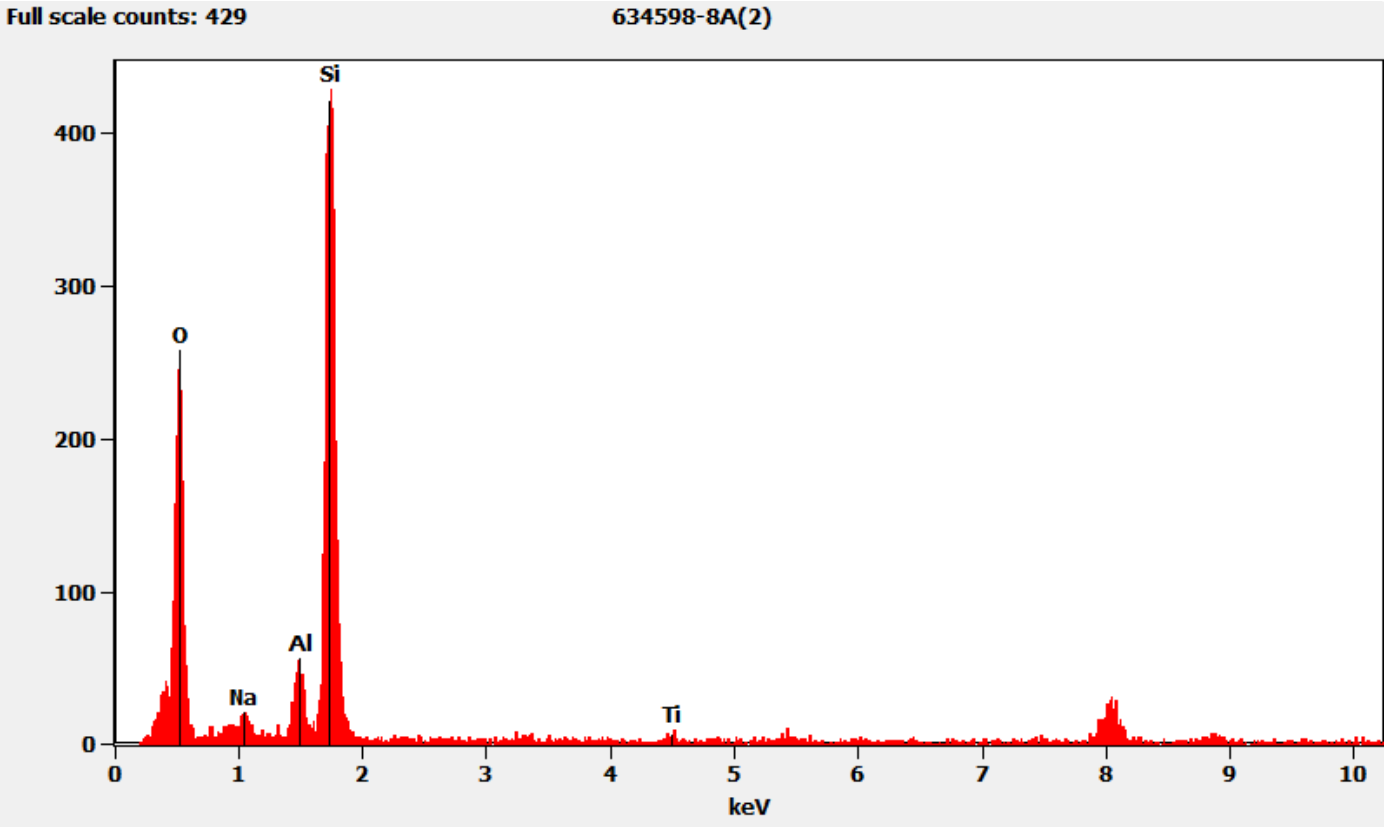
Chemistry from the Silica Sphere Pictured Above



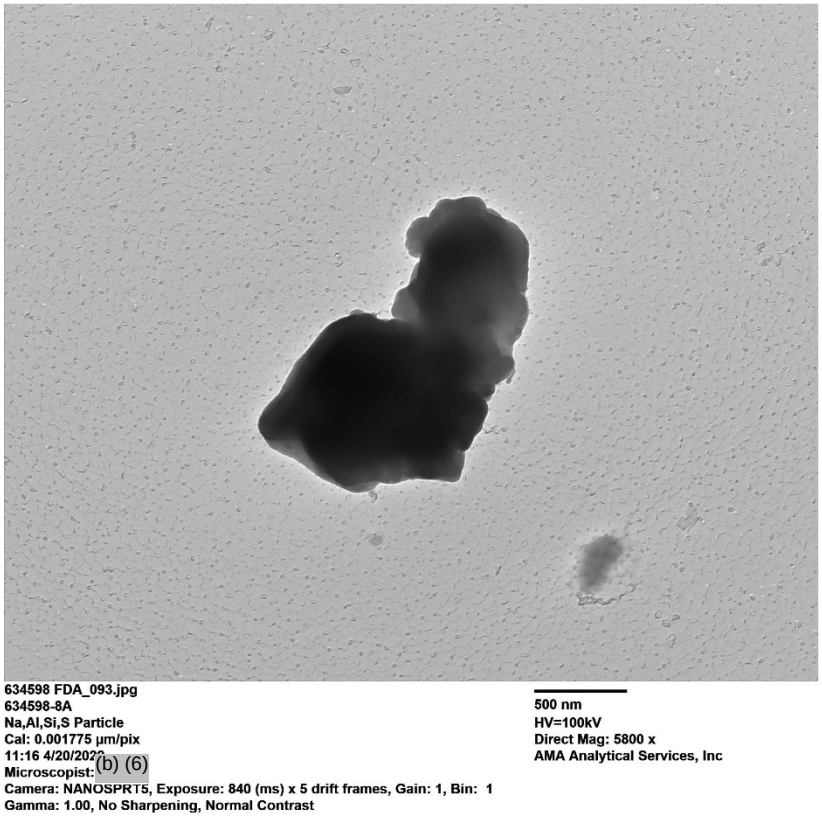
634598-8A, Particle Containing Sodium, Aluminum, and Silicon



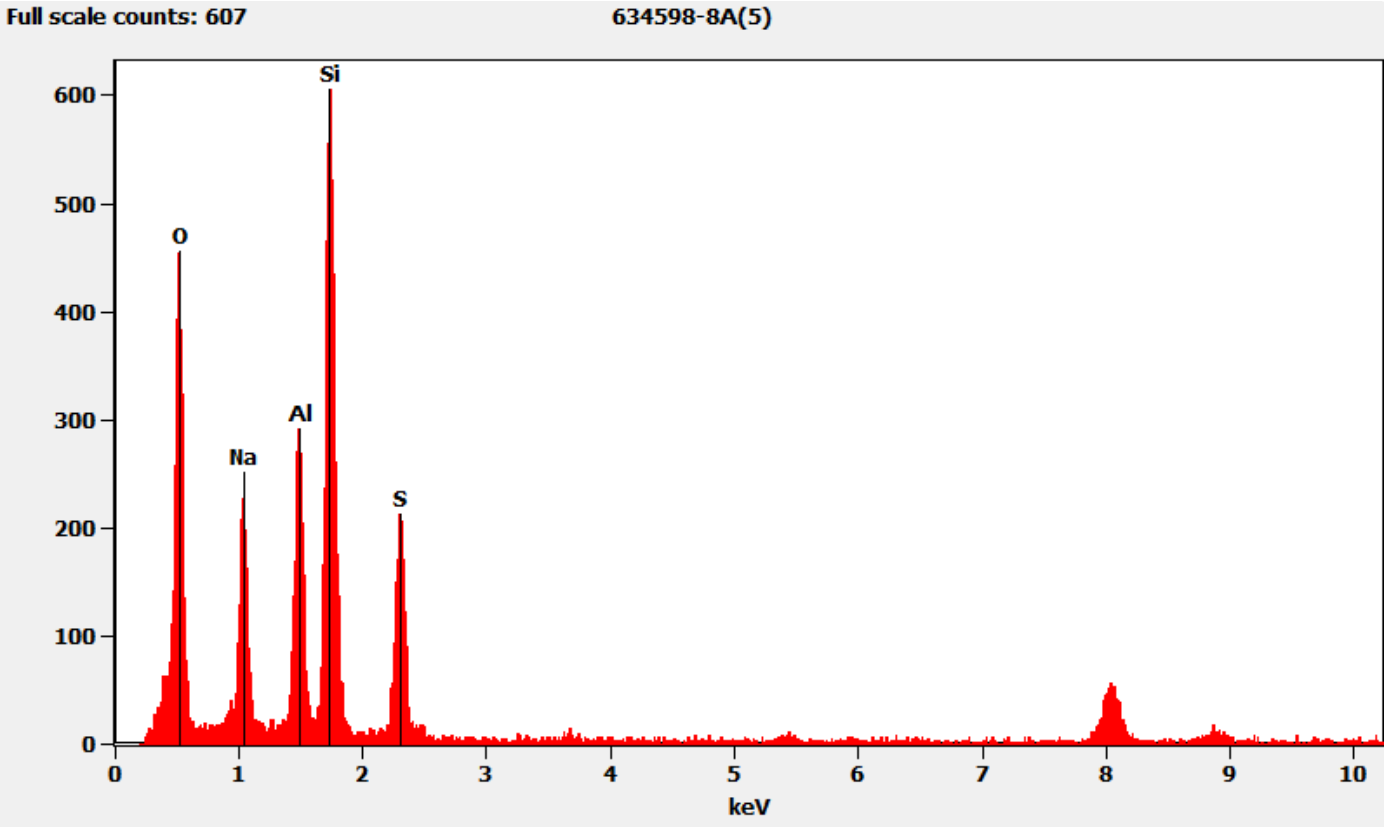
Chemistry from the Particle Containing Sodium, Aluminum, and Silicon Pictured Above



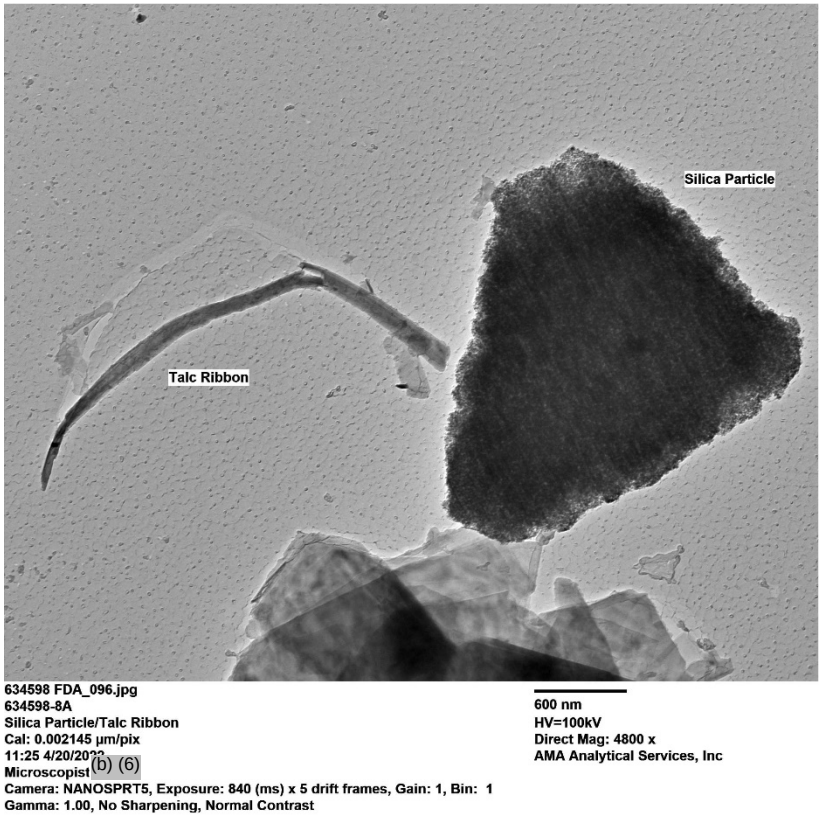
634598-8A, Particle Containing Sodium, Aluminum, Silicon, and Sulfur



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



634598-8A, Silicon Particle & Talc Ribbon

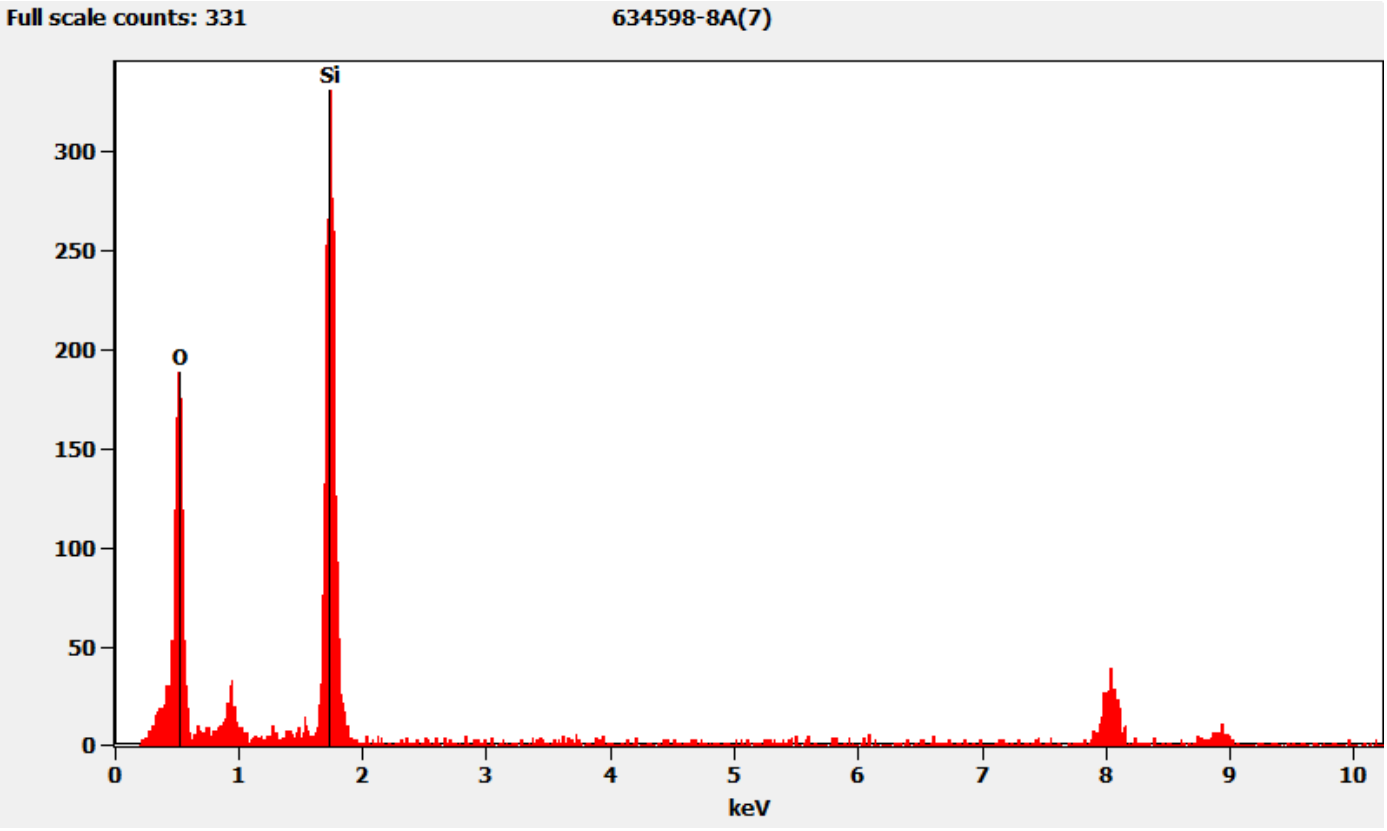


Diffraction Pattern from the Talc Ribbon Pictured Above

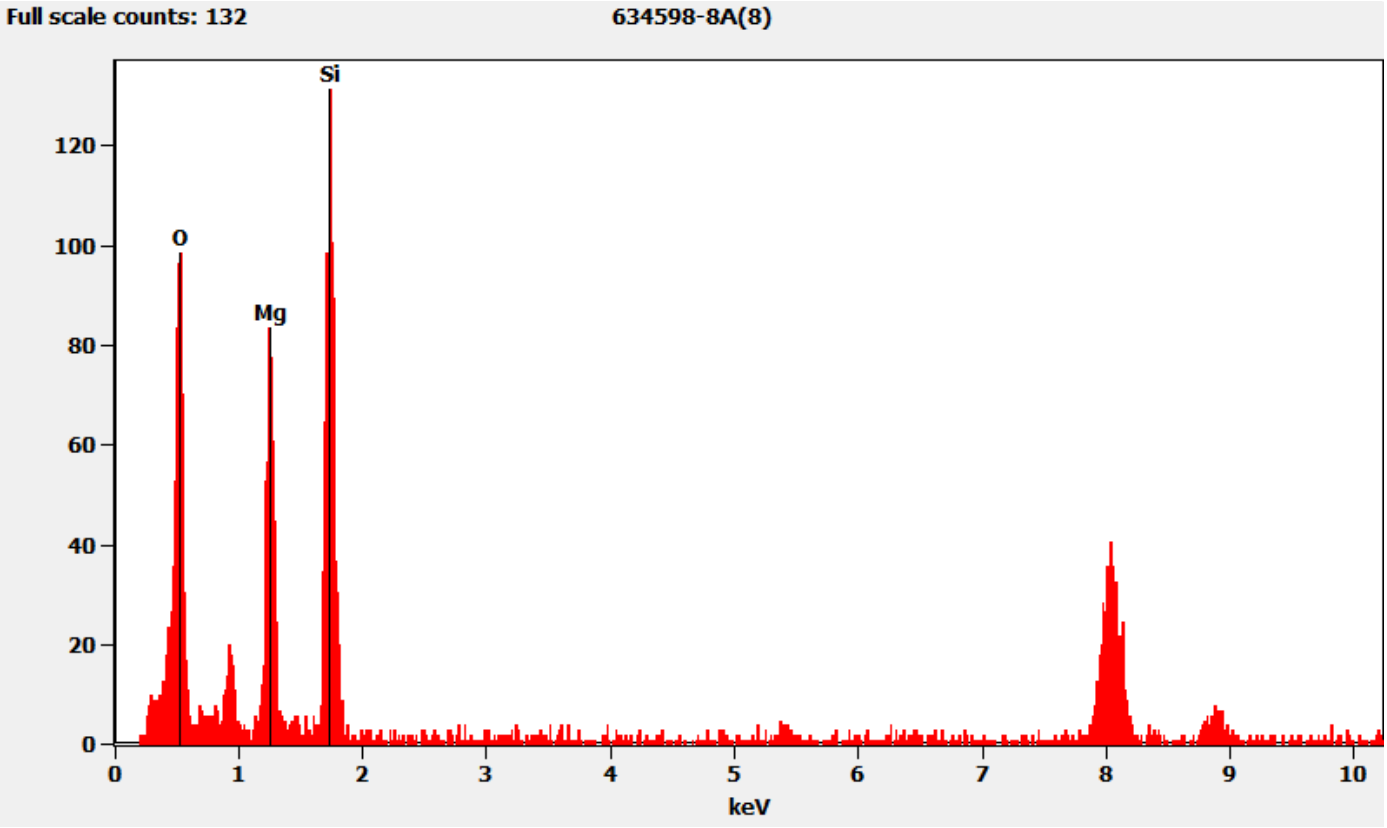
634598 FDA_097.jpg
634598-8A
Talc Ribbon
11:27 4/20/2022
Microscopist (b) (6)
Camera: NANOSPR13, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

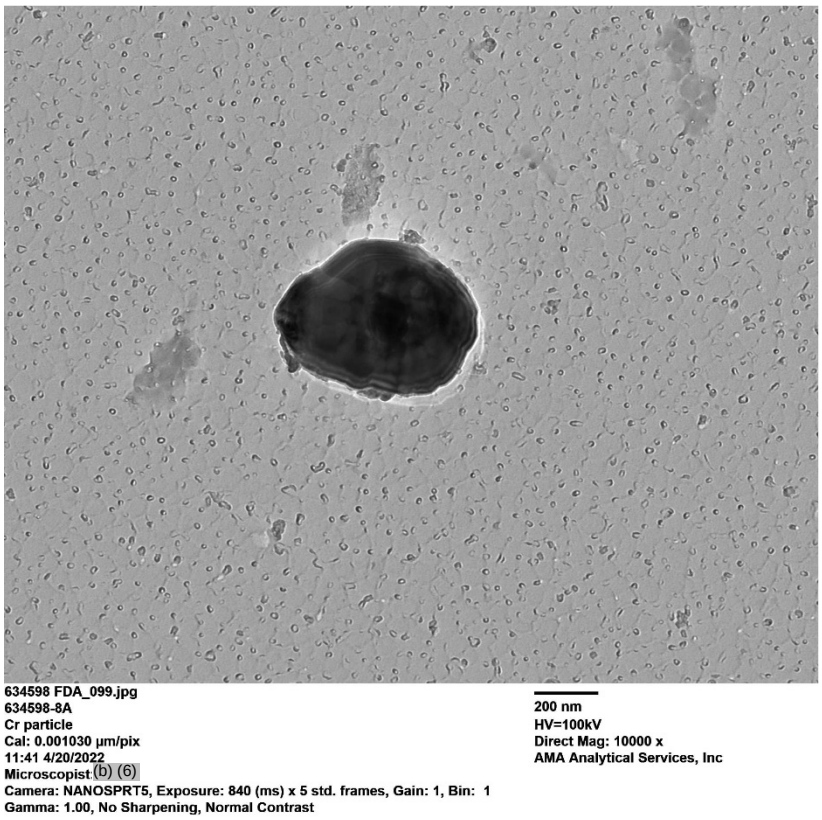
Chemistry from the Silicon Particle Pictured Above



Chemistry from the Talc Ribbon Pictured Above



634598-8A, Chromium Particle

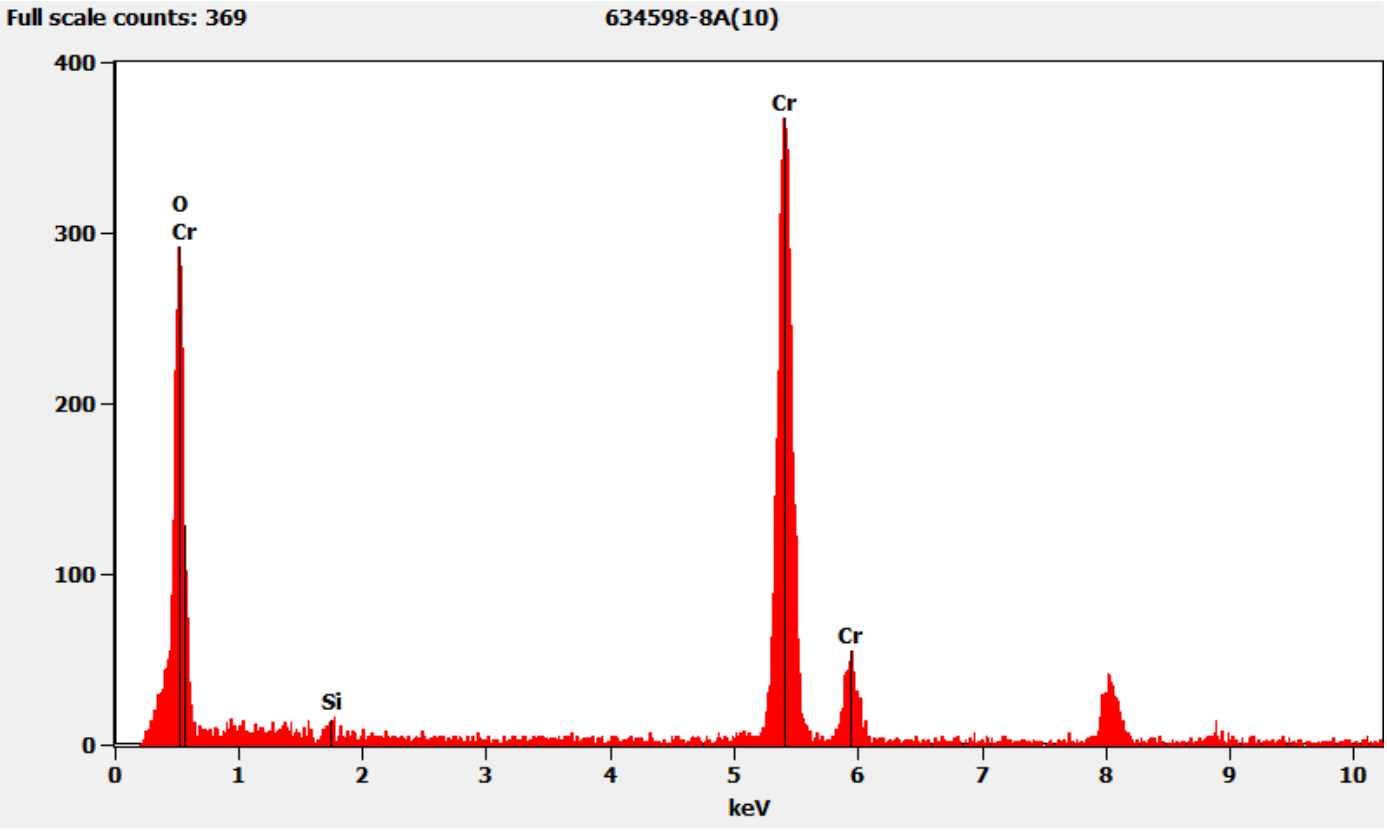


Diffraction Pattern from the Chromium Particle Pictured Above

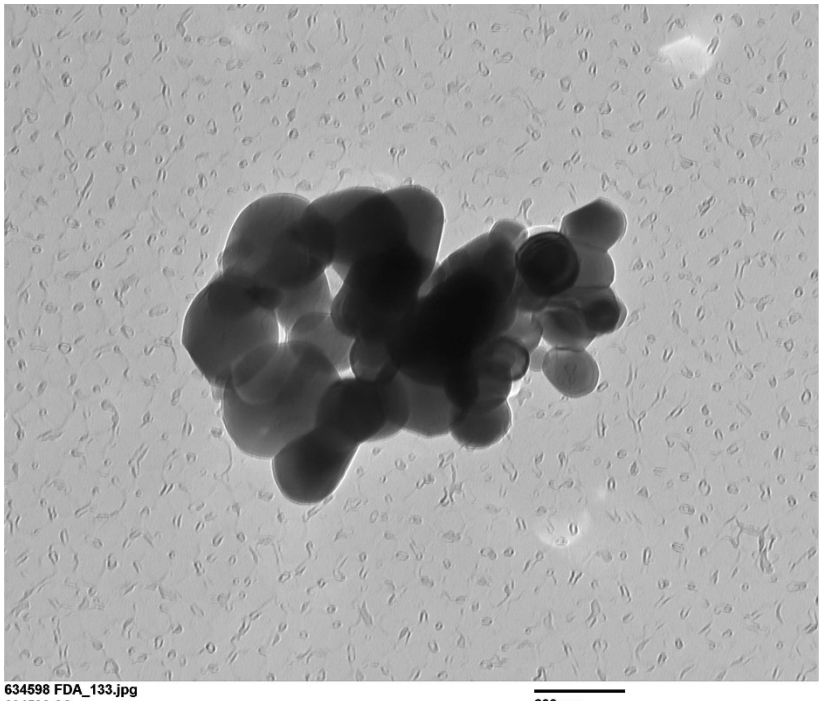
634598 FDA_098.jpg
634598-8A
Cr particle
11:40 4/20/2022
Microscopist: (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Chromium Particle Pictured Above



634598-8C, Titanium Particles



634598 FDA_133.jpg
634598-8C
Ti Particles
Cal: 0.726816 nm/pix
12:23 4/21/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

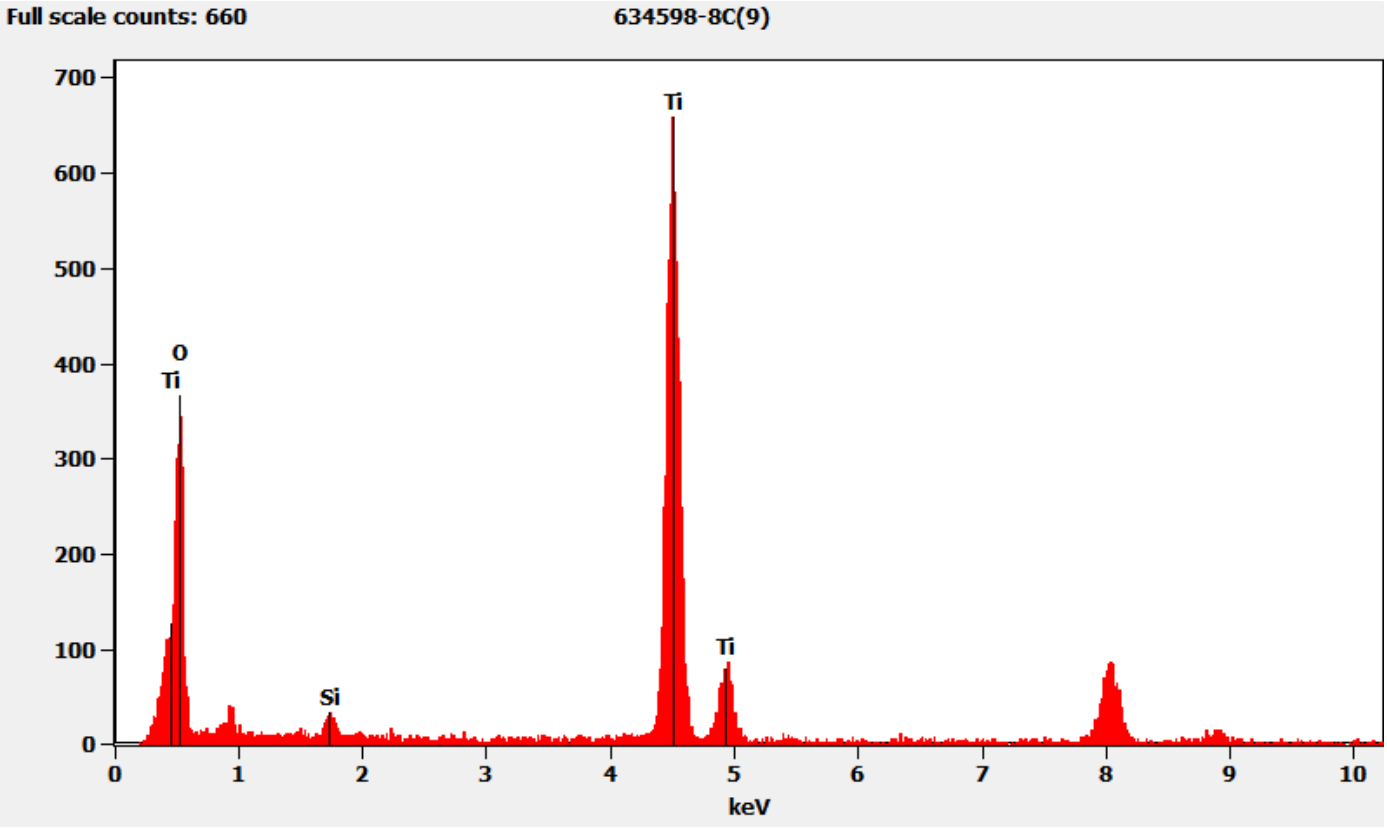
200 nm
HV=100kV
Direct Mag: 14000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Titanium Particles Pictured Above

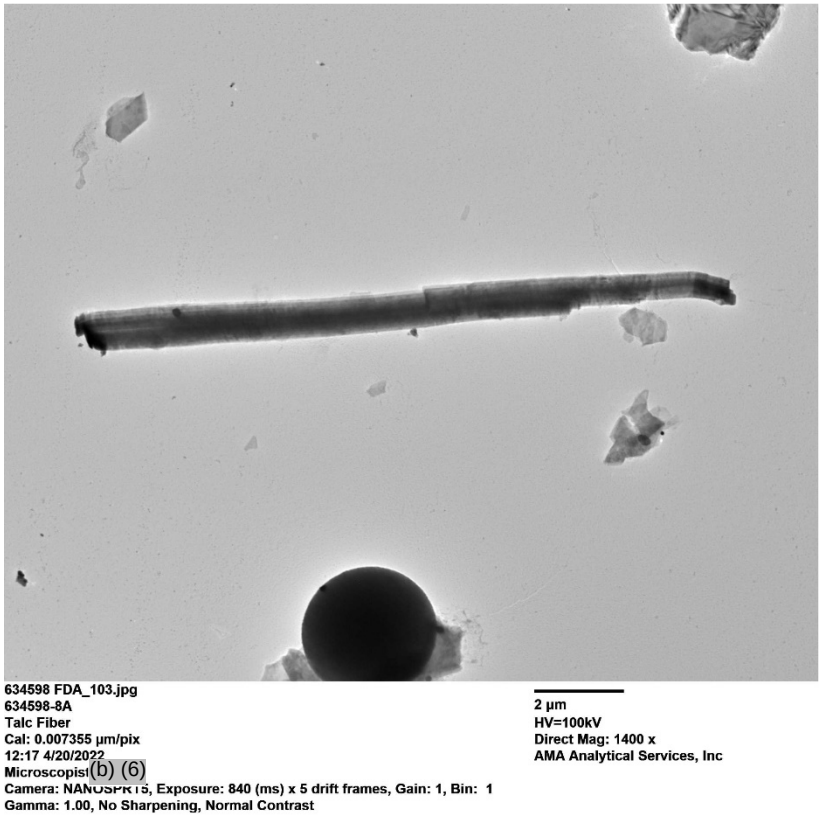
634598 FDA_132.jpg
634598-8C
Ti Particles
12:22 4/21/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

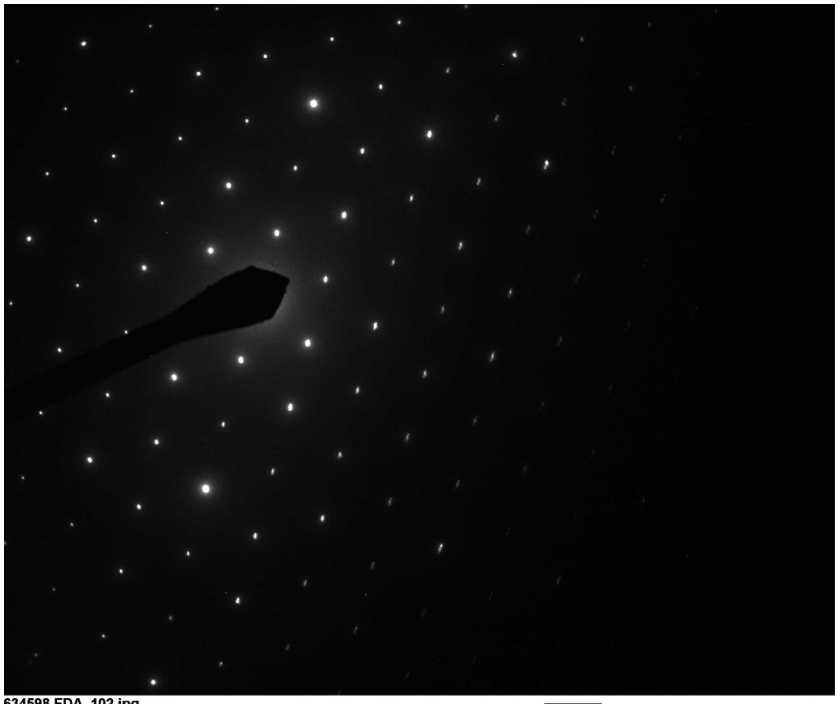
Chemistry from the Titanium Particle Pictured Above



634598-8A, Elongated Talc Particle



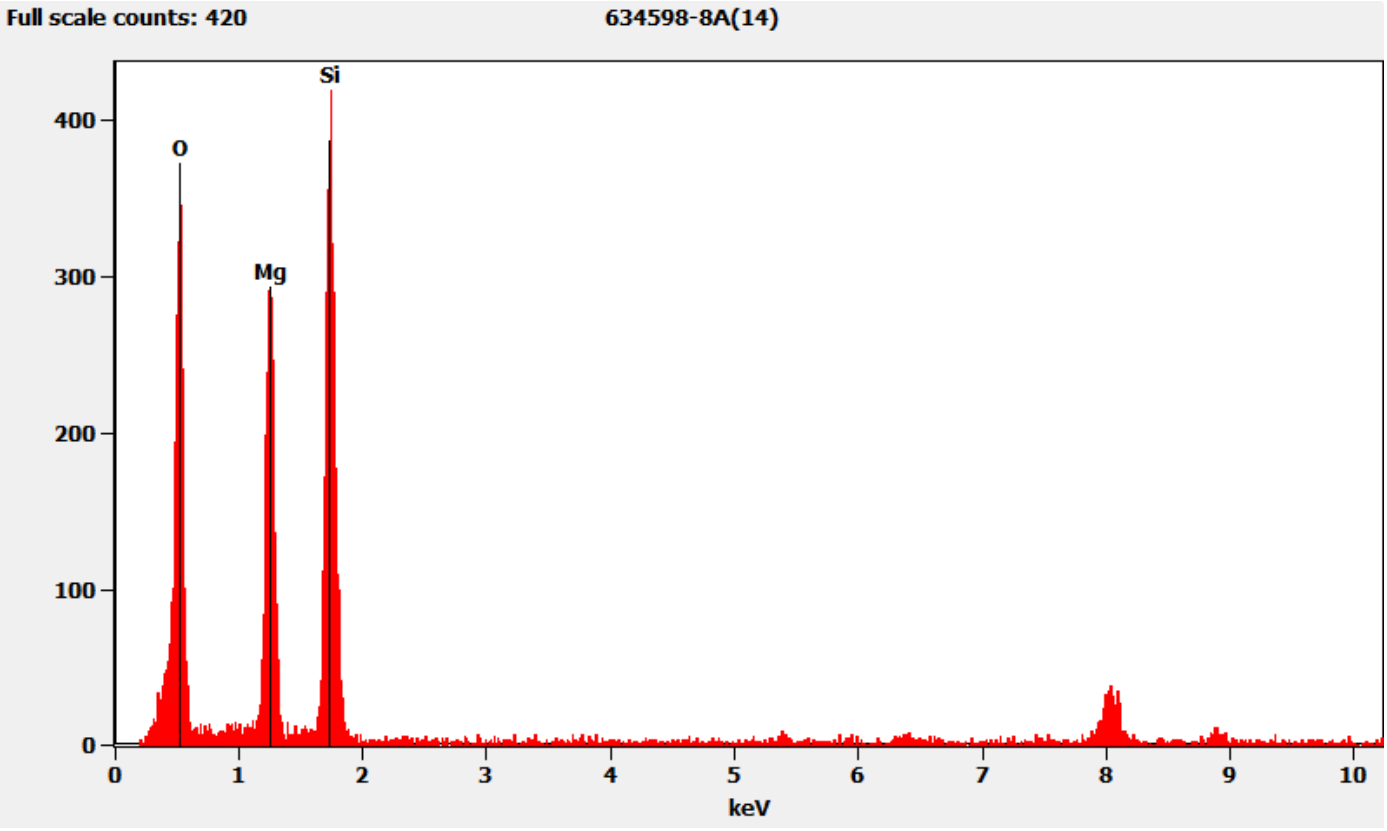
Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above



634598 FDA_102.jpg
634598-8A
Talc Fiber
12:16 4/20/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-9A, 9B, 9C/Client Sample: 03022022-9

PLM

All three aliquots of sample 03022022-9 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-9A	No Asbestos Detected
634598-9B	No Asbestos Detected
634598-9C	No Asbestos Detected

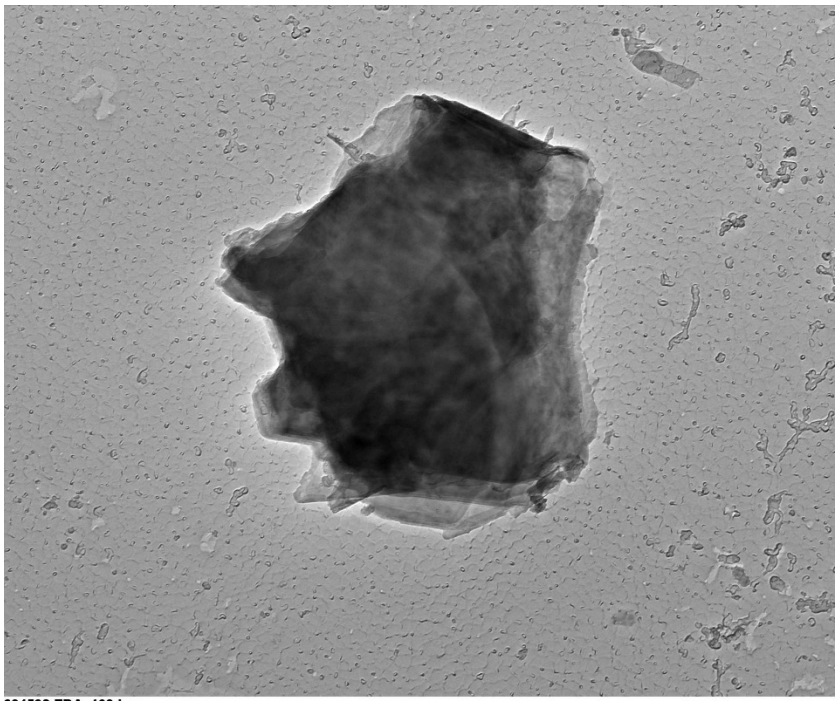
TEM

(b) (6) analyzed aliquot 9A on April 20, 2022. Andreas Saldivar analyzed aliquots 9B and 9C on April 22, 2022. The primary particles observed were talc, mica, and silica spheres; silicon particles and elongated talc particles were also observed along with calcium particles and talc ribbons. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

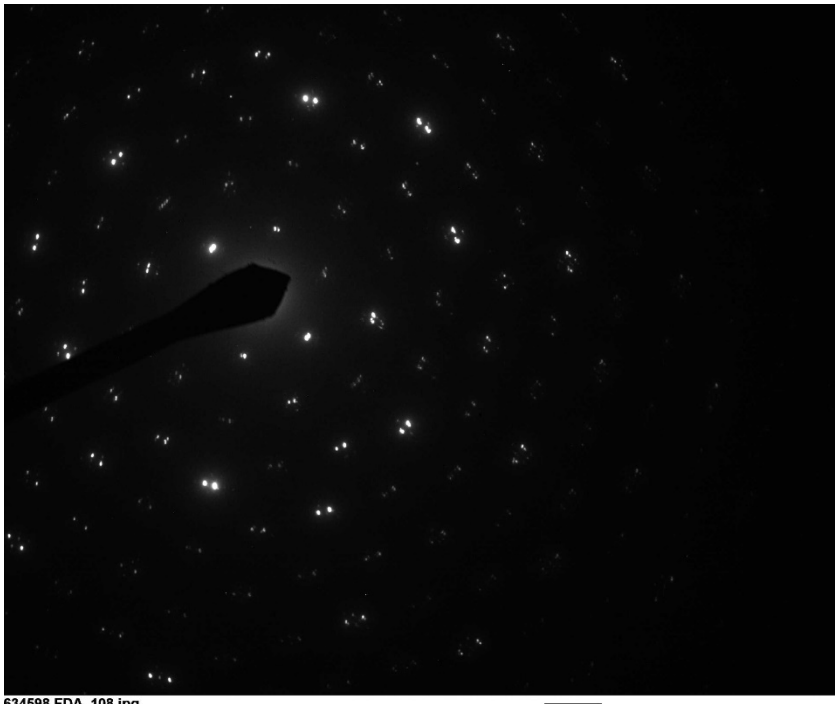
634598-9A	No Asbestos Detected
634598-9B	No Asbestos Detected
634598-9C	No Asbestos Detected

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.

634598-9A, Layered Talc Particle



Hexagonal Diffraction Pattern from the Layered Talc Particle Pictured Above

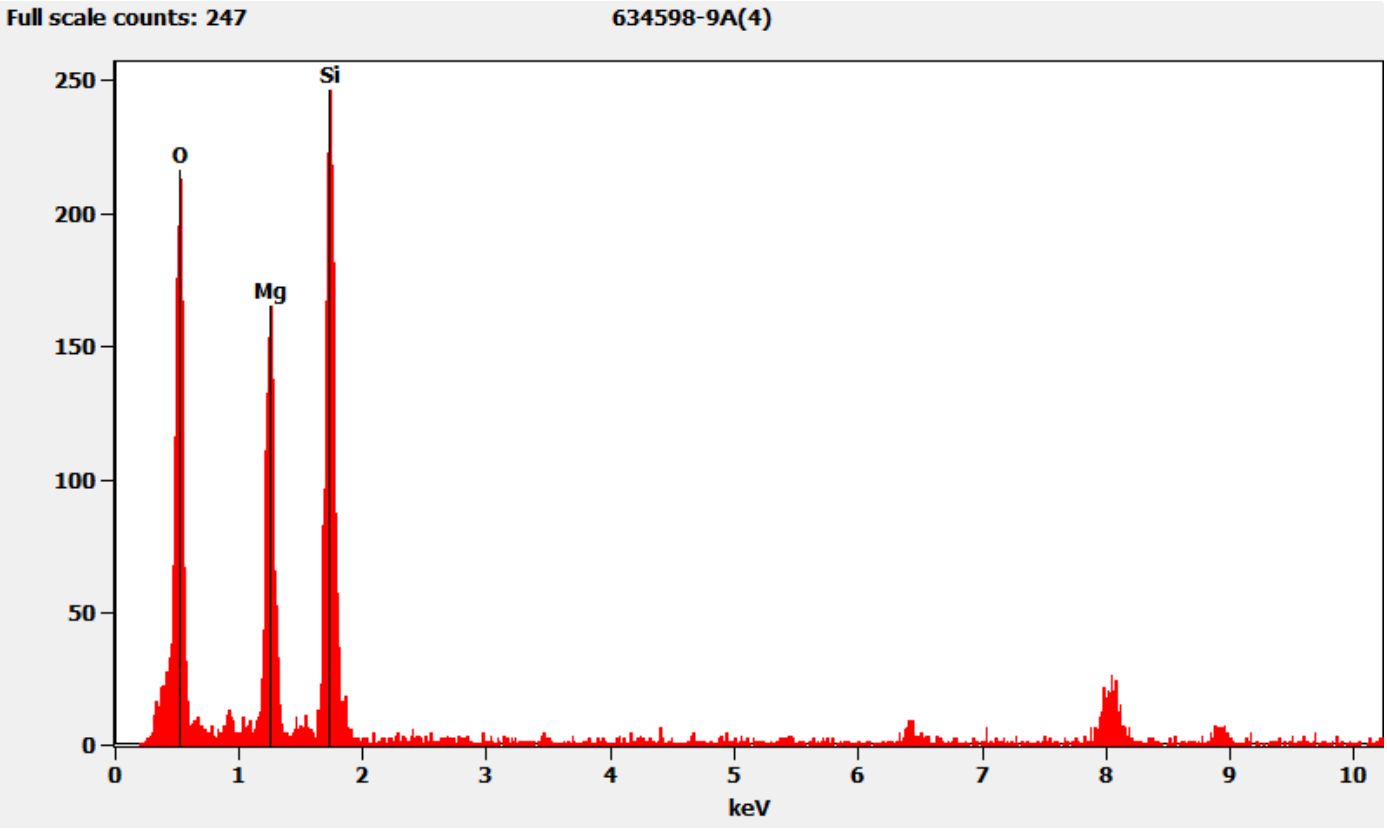


634598 FDA_108.jpg
634598-9A
Talc Particle
14:41 4/20/2022

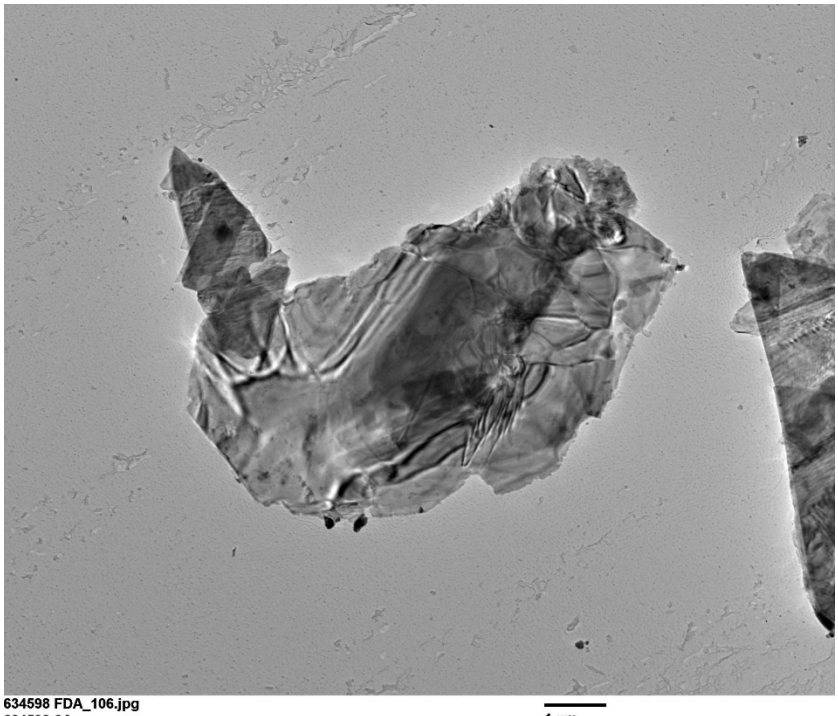
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Layered Talc Particle pictured above



634598-9A, Mica Particle



634598 FDA_106.jpg
634598-9A
Mica Particle
Cal: 0.005419 µm/pix
14:38 4/20/2022
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

1 µm
HV=100kV
Direct Mag: 1900 x
AMA Analytical Services, Inc

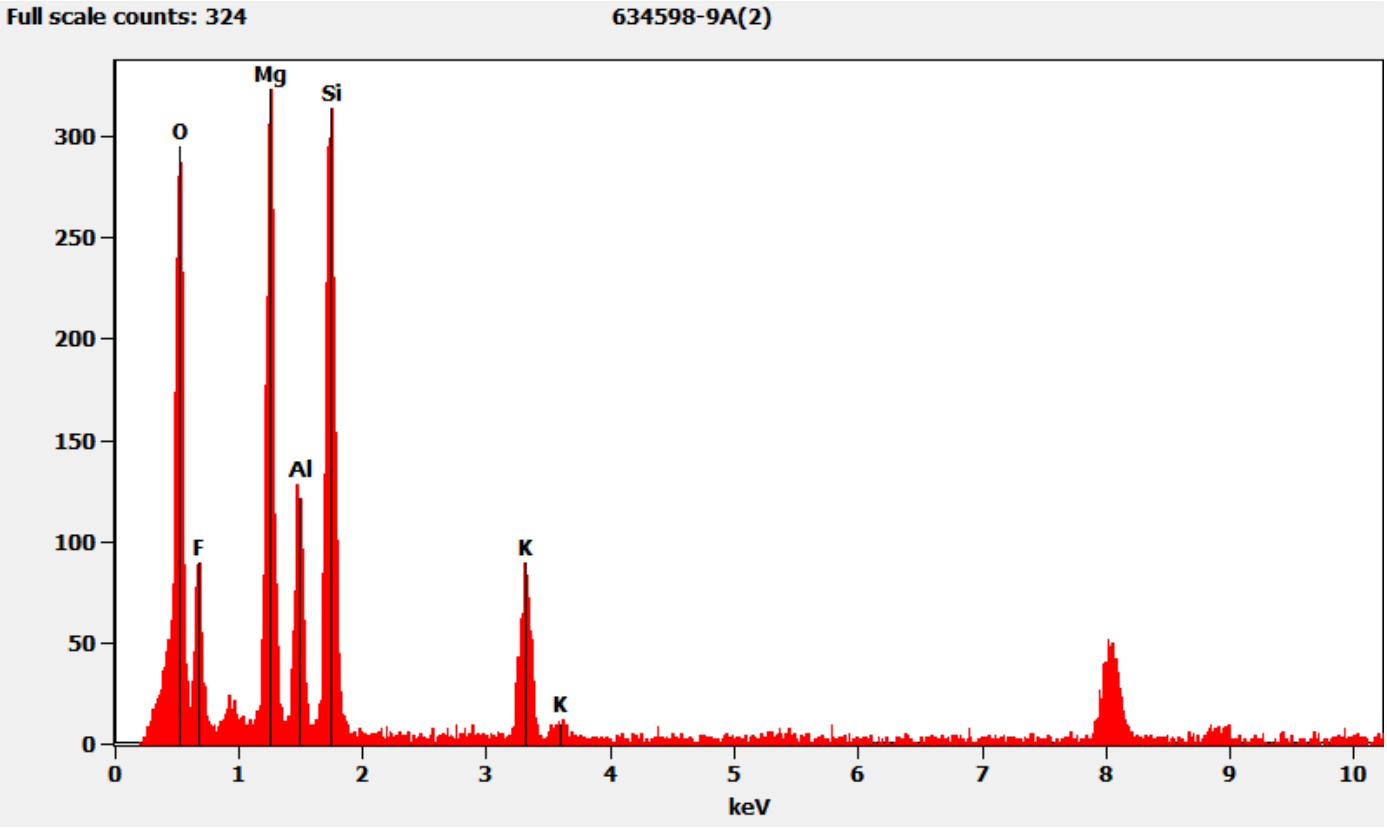
Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

634598 FDA_105.jpg
634598-9A
Mica Particle
14:37 4/20/2022

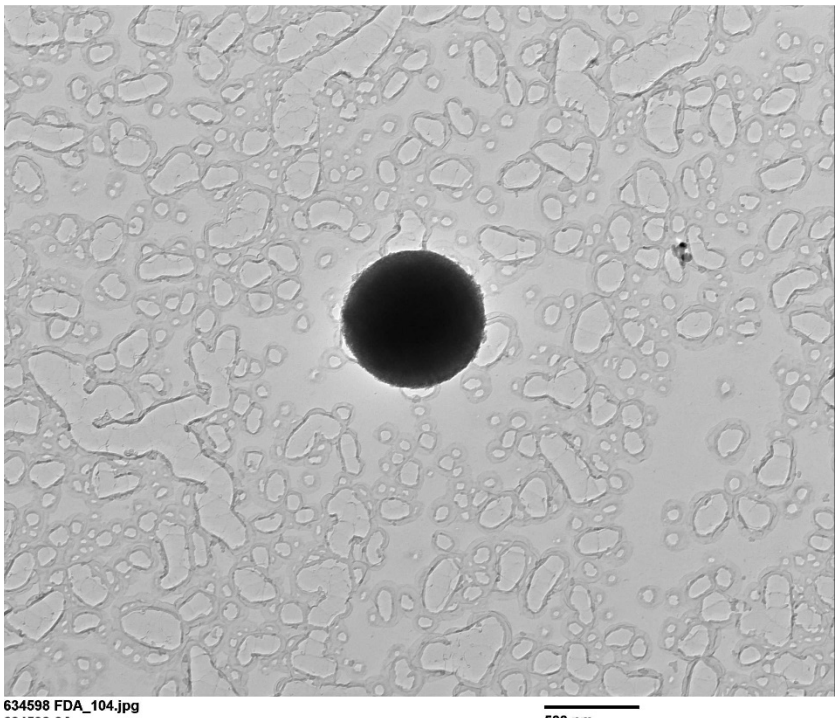
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

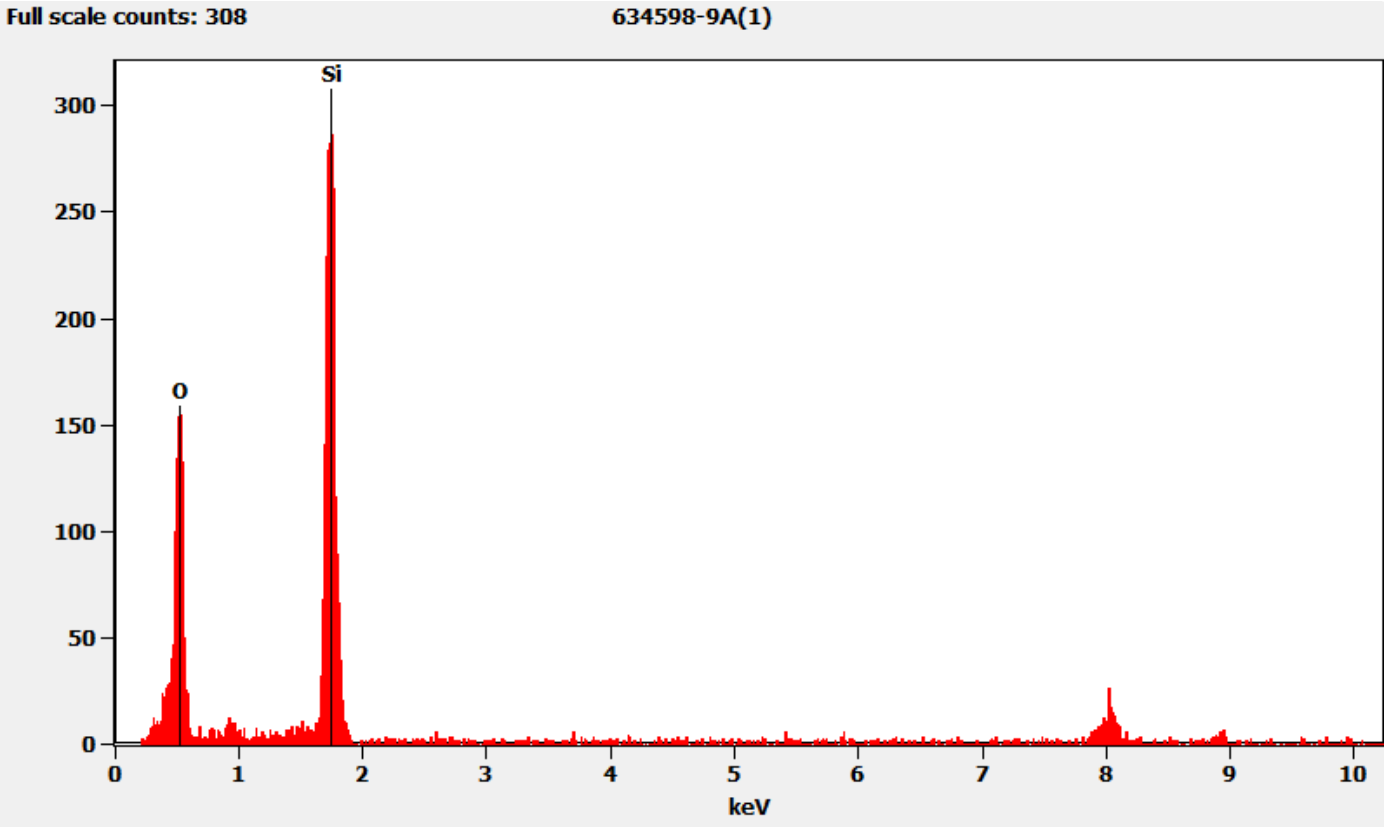
Chemistry from the Mica Particle pictured above



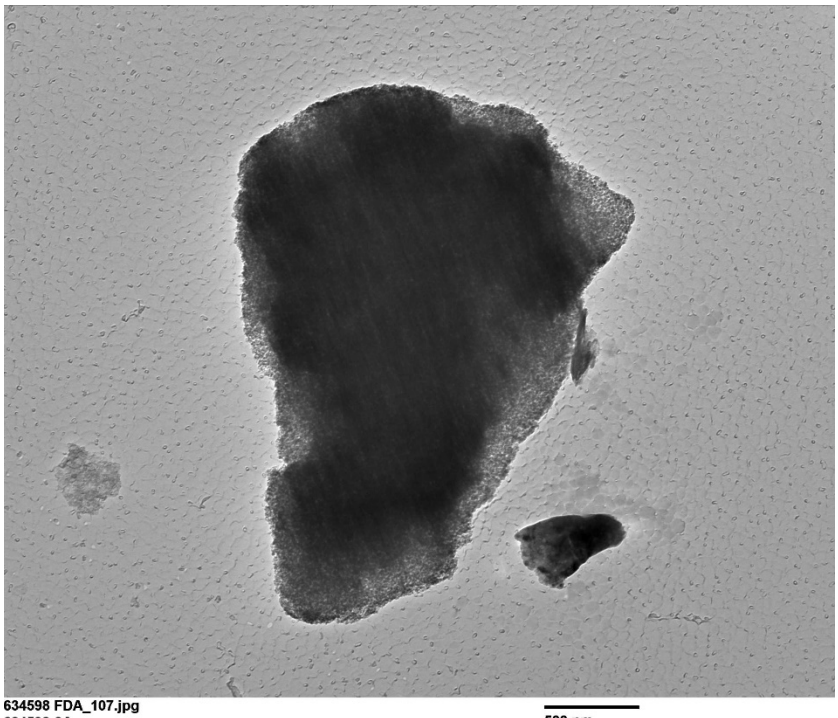
634598-9A, Silica Sphere



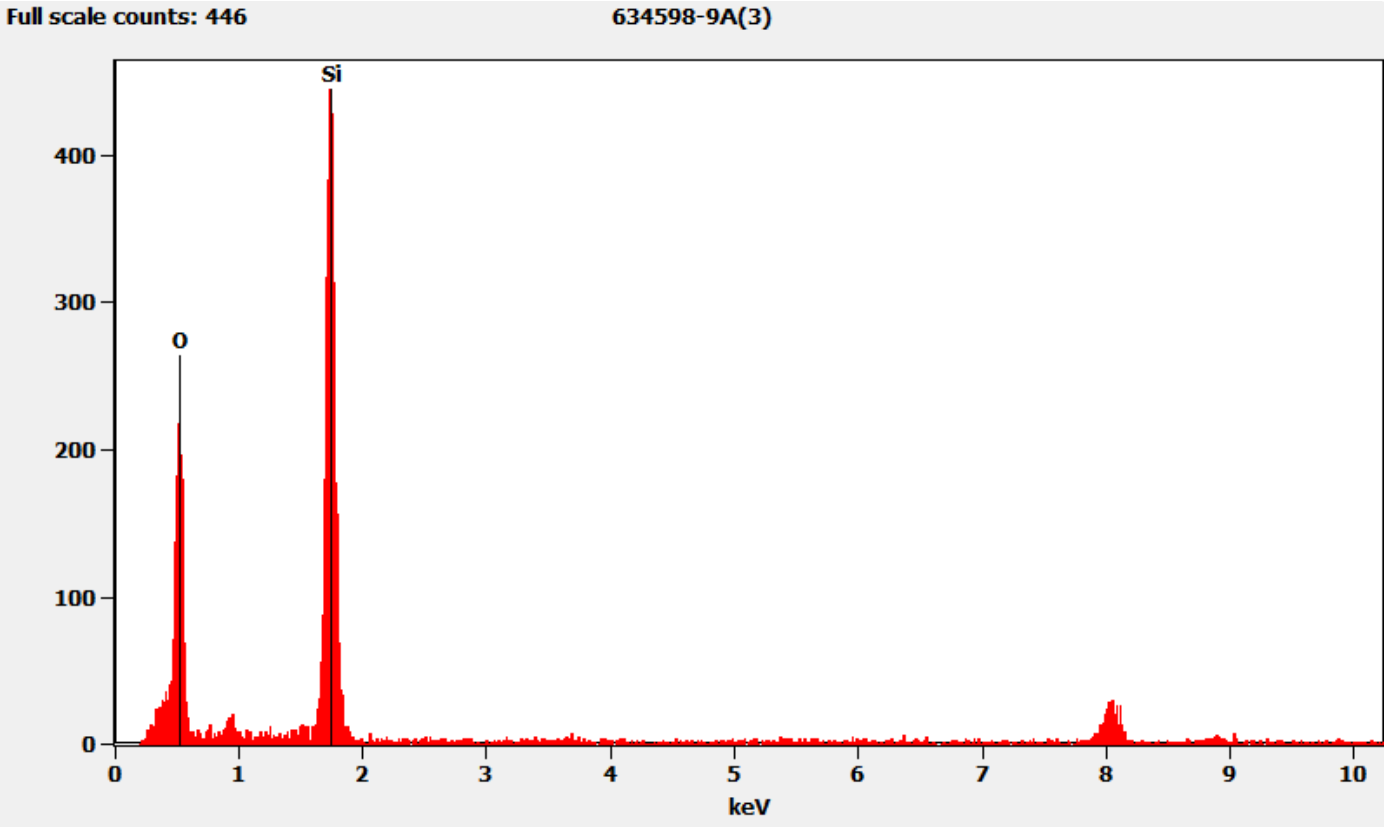
Chemistry from the Silica Sphere pictured above



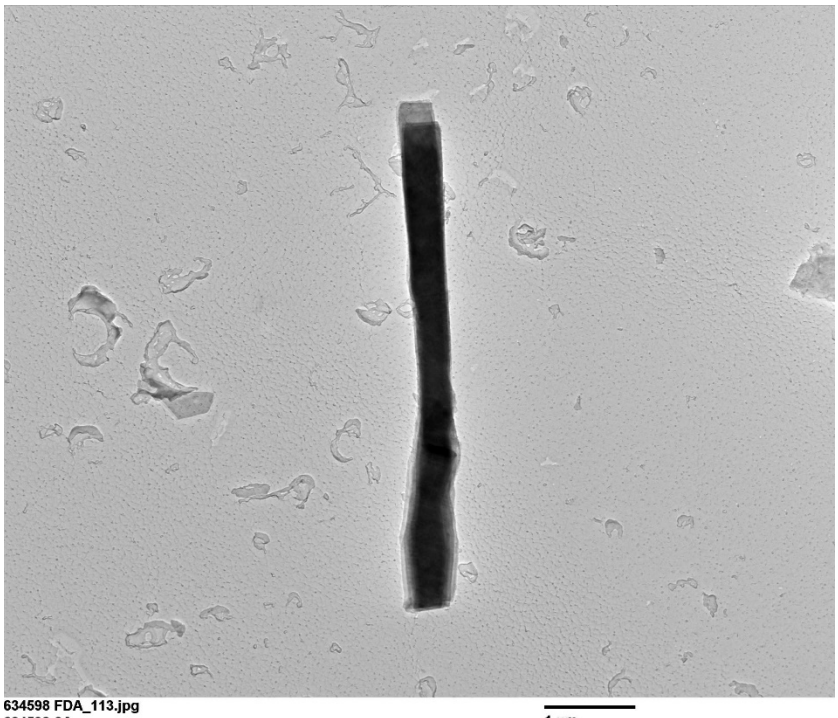
634598-9A, Silicon Particle



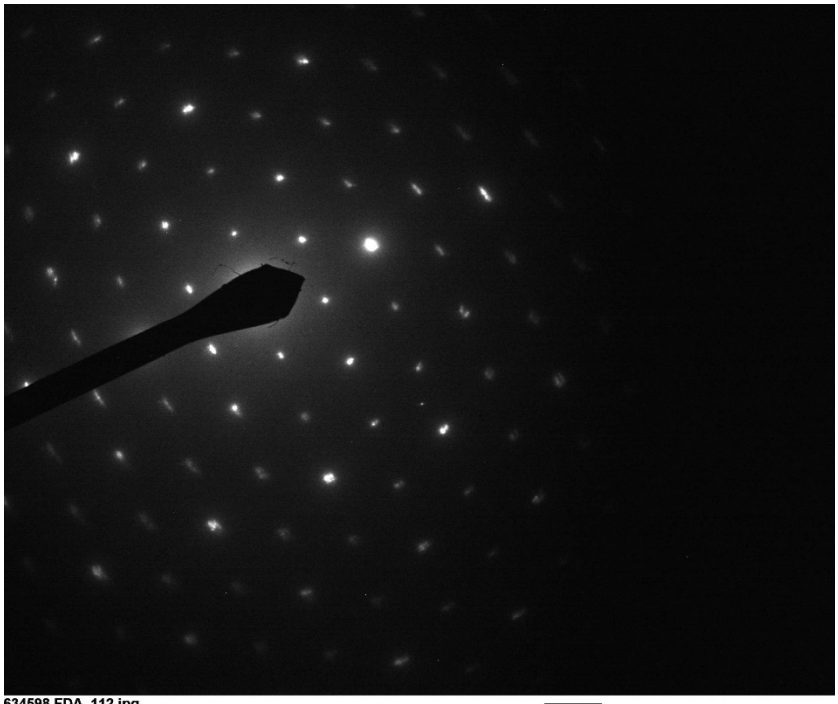
Chemistry from the Silicon Particle Pictured Above



634598-9A, Elongated Talc Particle



Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

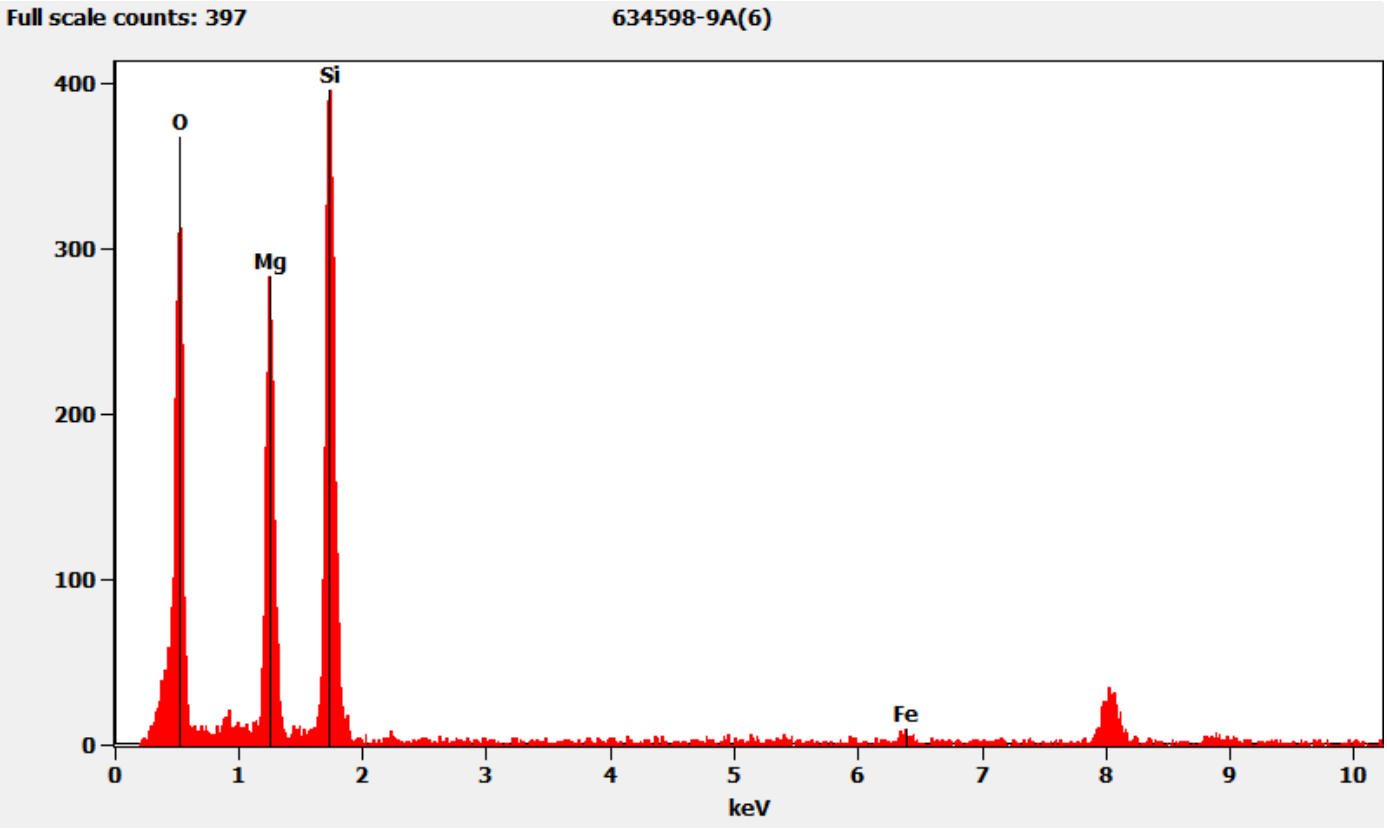


634598 FDA_112.jpg
634598-9A
Talc Fiber
14:50 4/20/2022

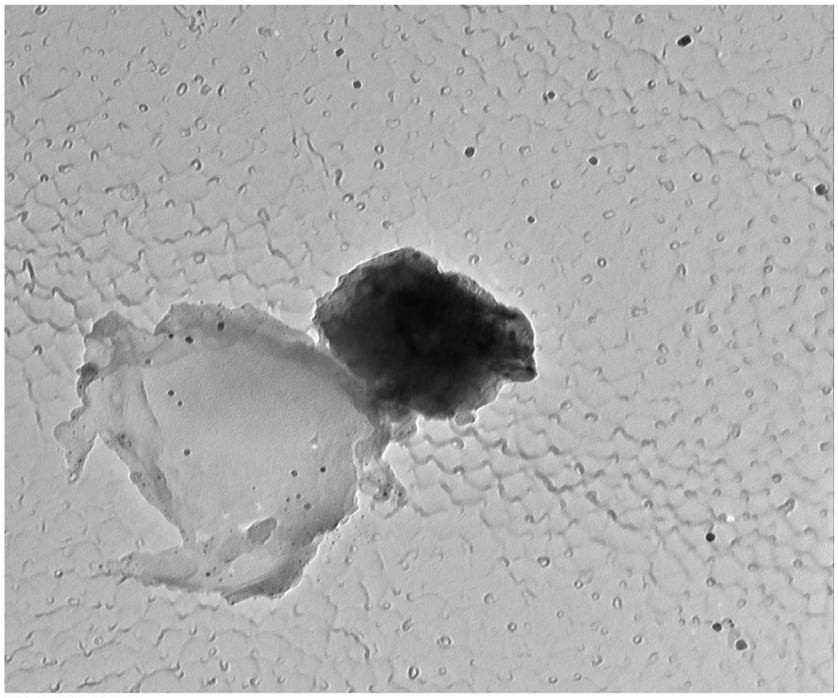
100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

Chemistry from the Elongated Talc Particle pictured above



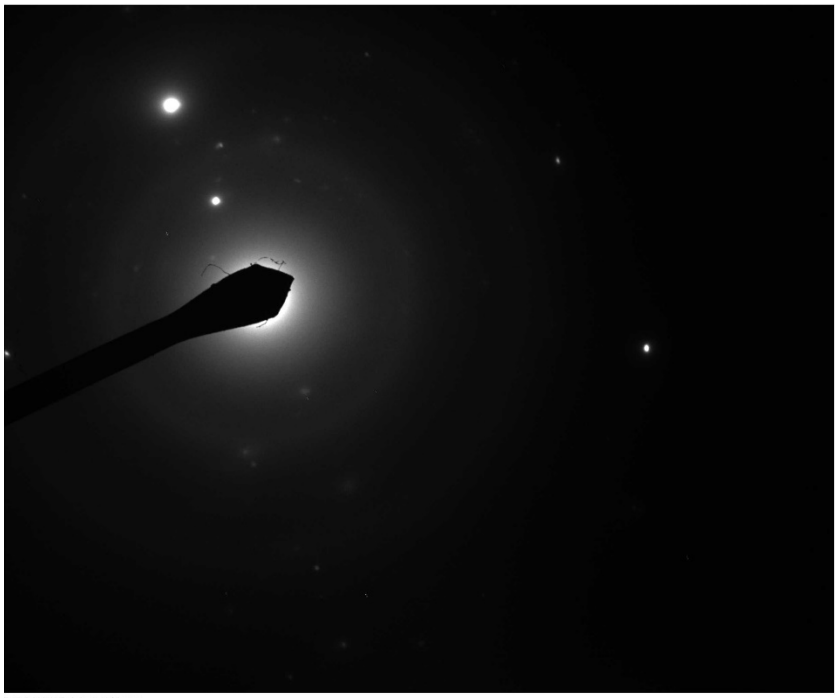
634598-9A, Calcium Particle



634598 FDA_111.jpg
634598-9A
Ca Particle
Cal: 0.726816 nm/pix
14:47 4/20/2022
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

200 nm
HV=100kV
Direct Mag: 14000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Calcium Particle Pictured Above

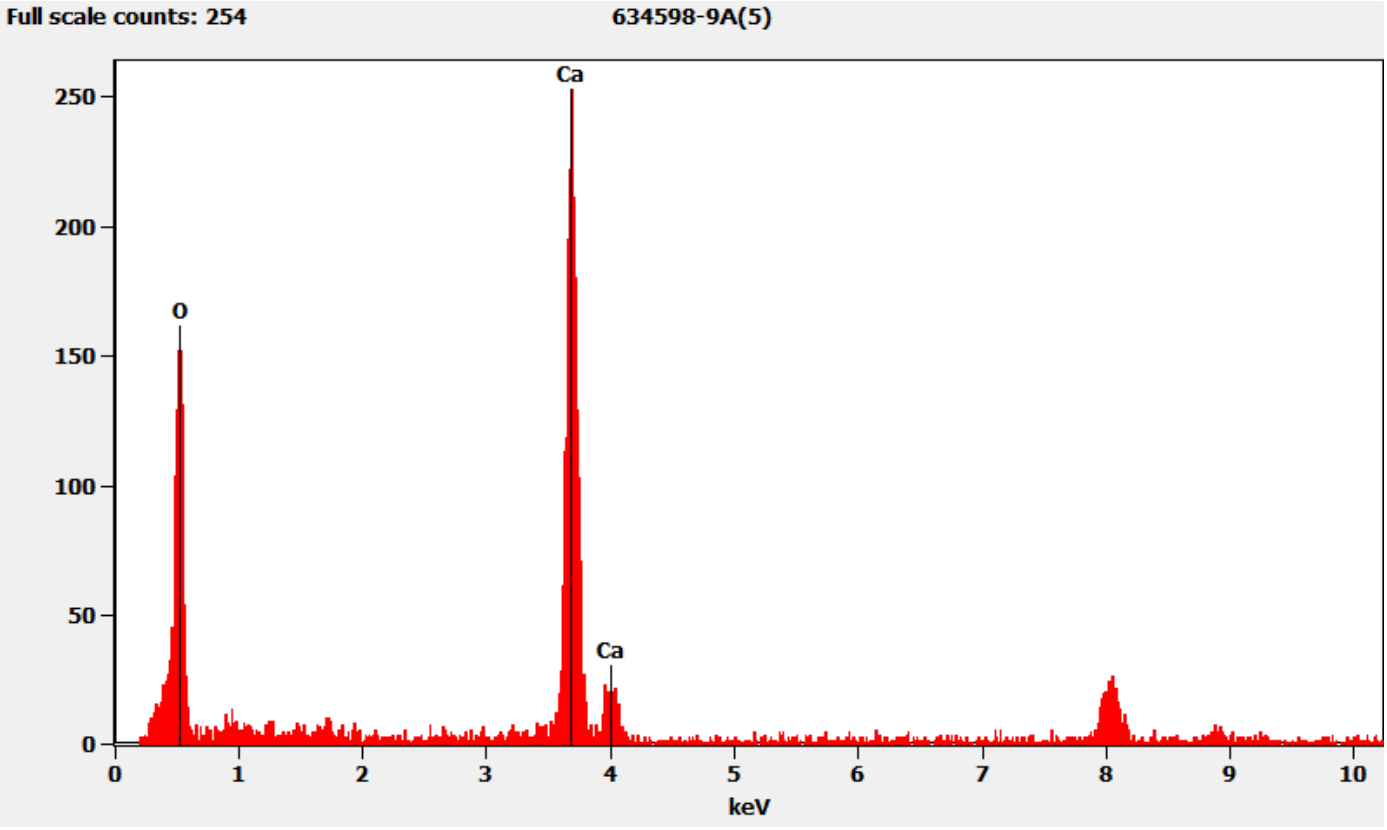


634598 FDA_110.jpg
634598-9A
Ca Particle
14:46 4/20/2022

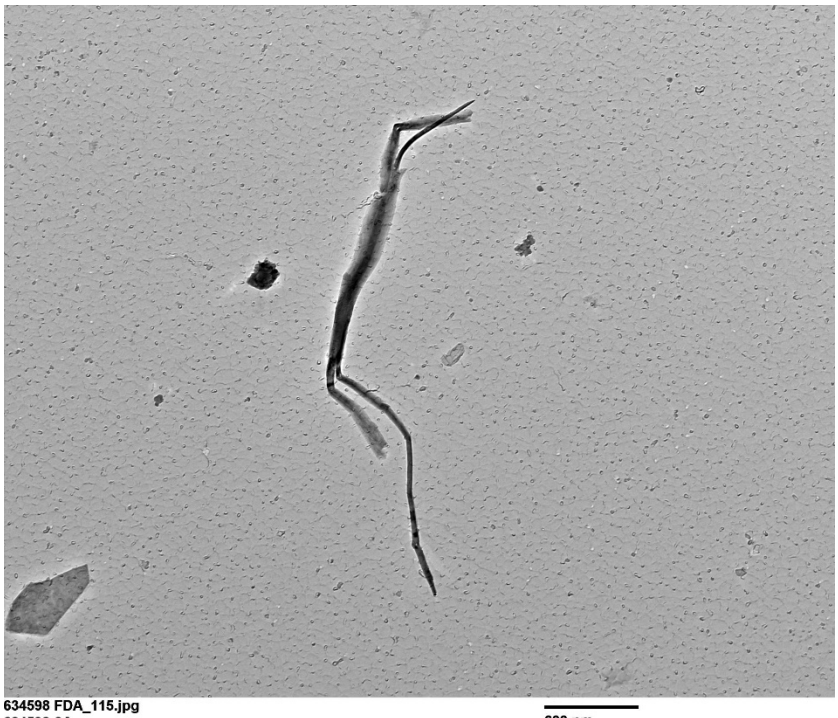
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Calcium Particle Pictured Above



634598-9A, Talc Ribbon



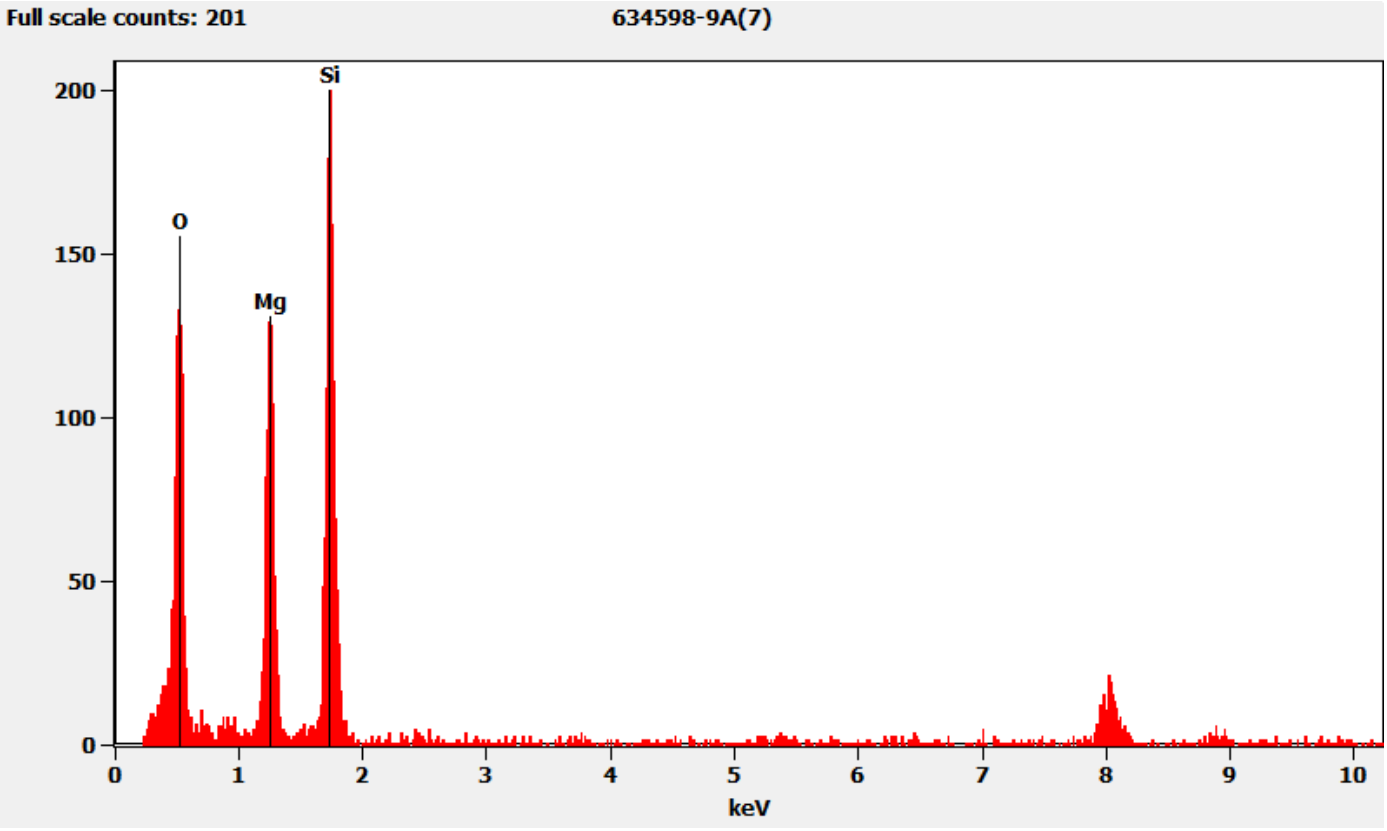
Diffraction Pattern from the Talc Ribbon Pictured Above

634598 FDA_114.jpg
634598-9A
Talc Ribbon
15:13 4/20/2022

Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-10A, 10B, 10C/Client Sample: 03022022-10

PLM

All three aliquots of sample 03022022-10 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-10A	No Asbestos Detected
634598-10B	No Asbestos Detected
634598-10C	No Asbestos Detected

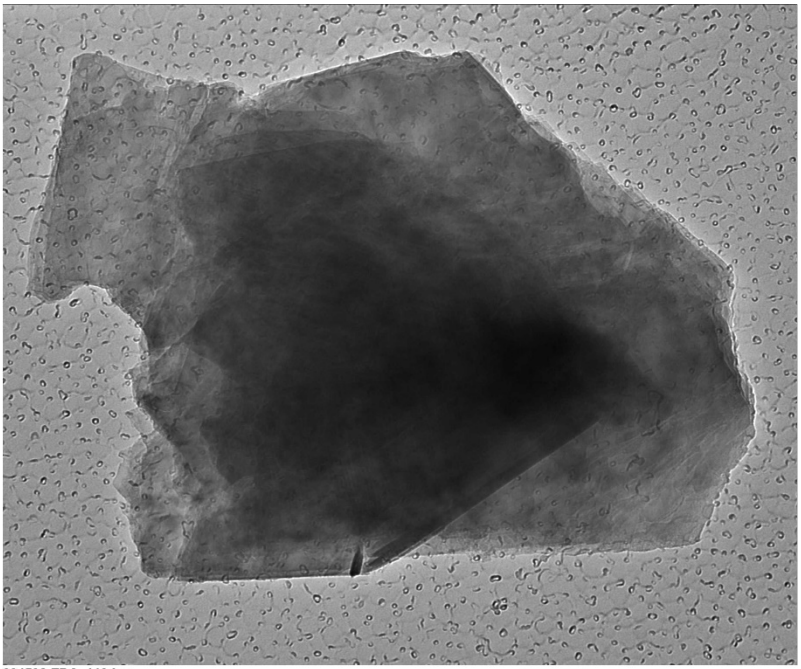
TEM

(b) (6) analyzed aliquot 10A on April 20, 2022, and aliquots 10B and 10C on April 25, 2022. The primary particle observed was talc; elongated talc particles and talc ribbons were also observed along with iron particles, mica particles with titanium, silica spheres, 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.

634598-10A	No Asbestos Detected
634598-10B	No Asbestos Detected
634598-10C	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

634598-10A, Talc Particle

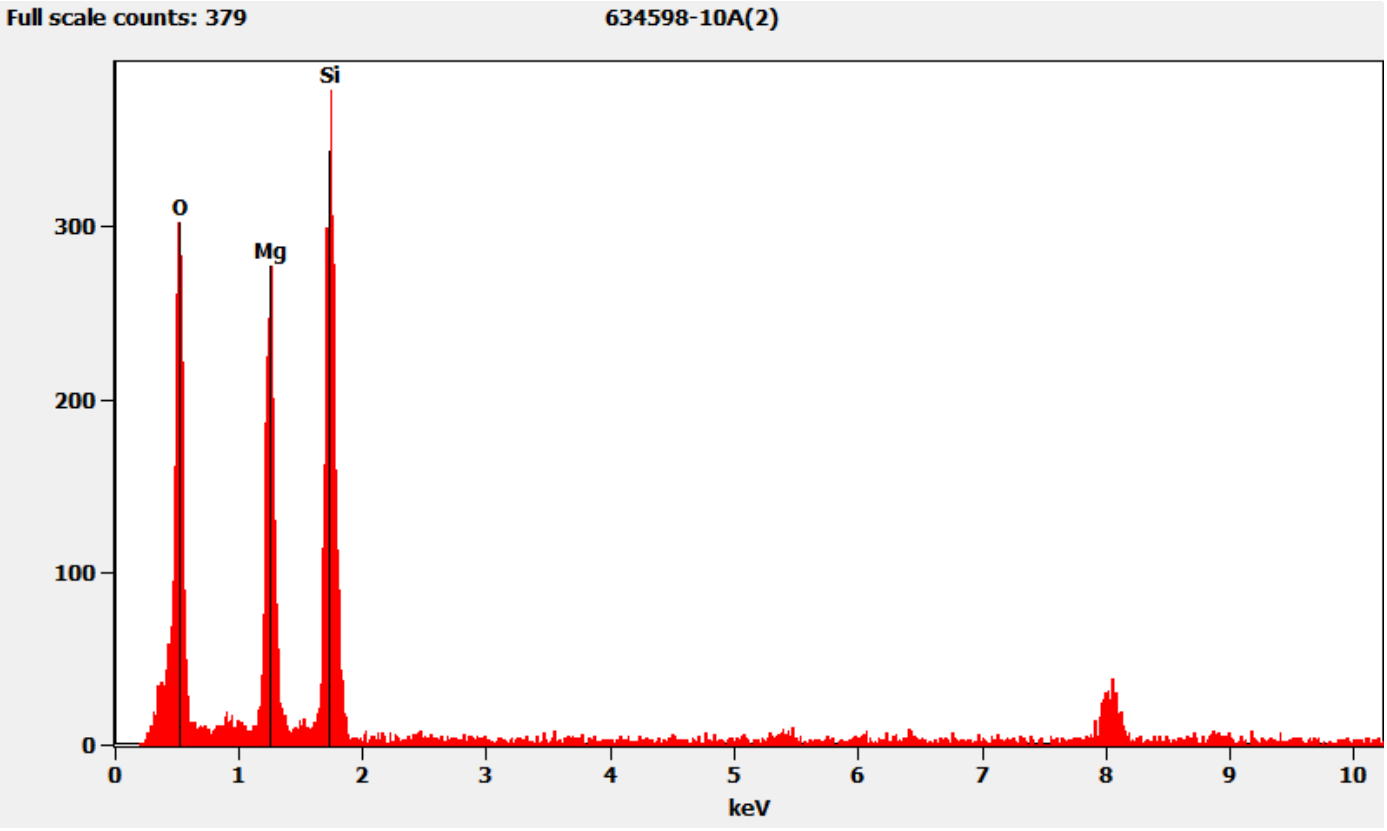


Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

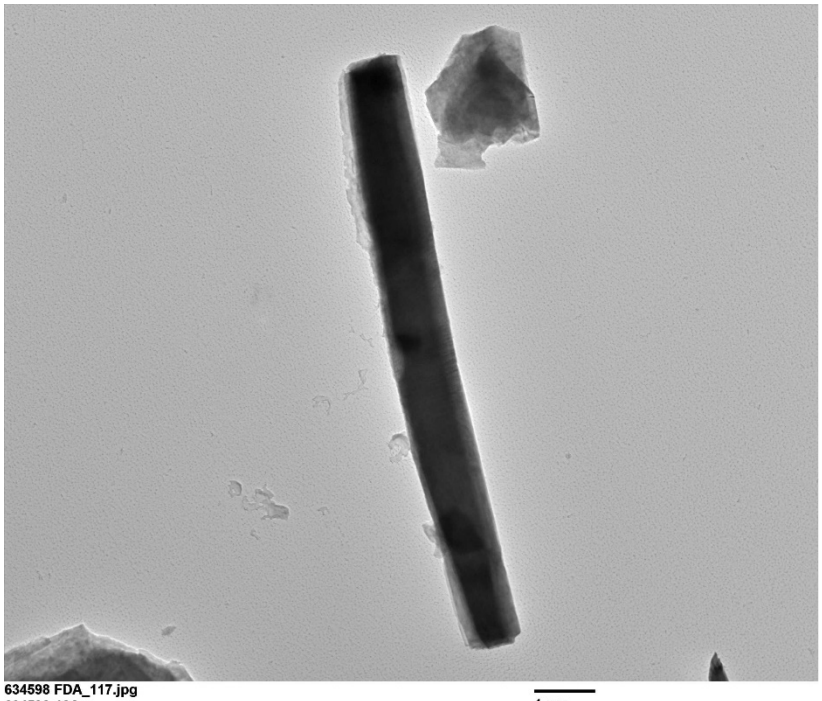
634598 FDA_118.jpg
634598-10A
Talc Particle
16:06 4/20/2022
Microscopist: (b) (6)
Camera: NANOSPRIS, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-10A, Elongated Talc Particle



634598 FDA_117.jpg
634598-10A
Talc Fiber
Cal: 0.005419 µm/pix
16:05 4/20/2022
Microscopist: (b) (6)
Camera: NANOSPR15, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

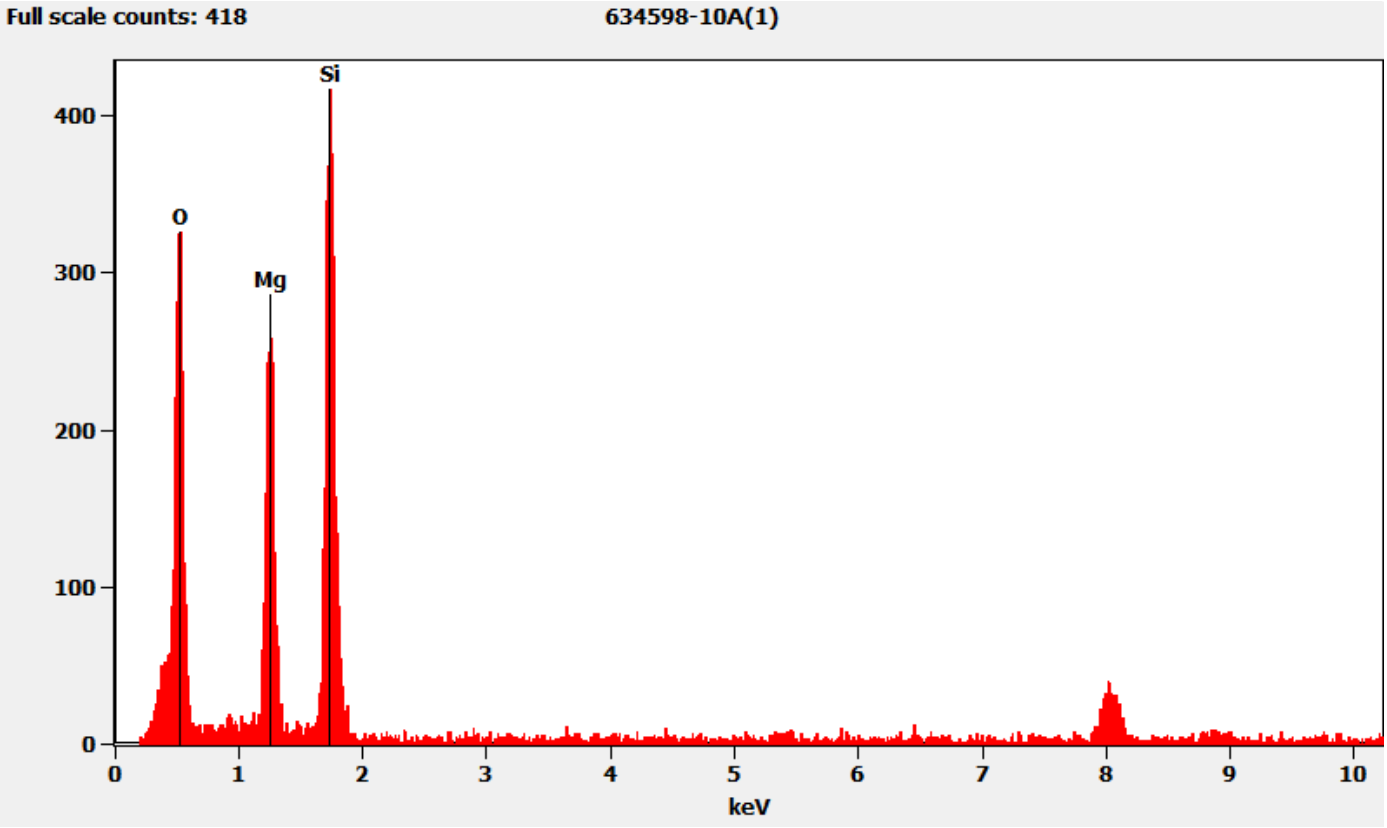
1 µm
HV=100kV
Direct Mag: 1900 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

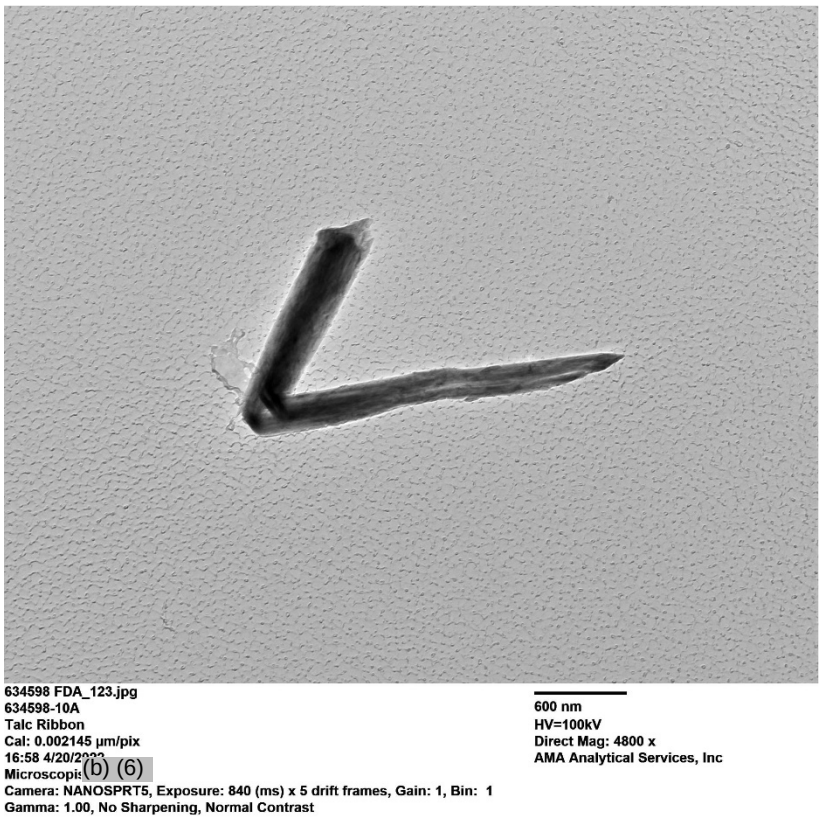
634598 FDA_116.jpg
634598-10A
Talc Fiber
16:04 4/20/2022
Microscopist: (b) (6)
Camera: NANOSPR15, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Elongated Talc Particle Pictured Above



634598-10A, Talc Ribbon

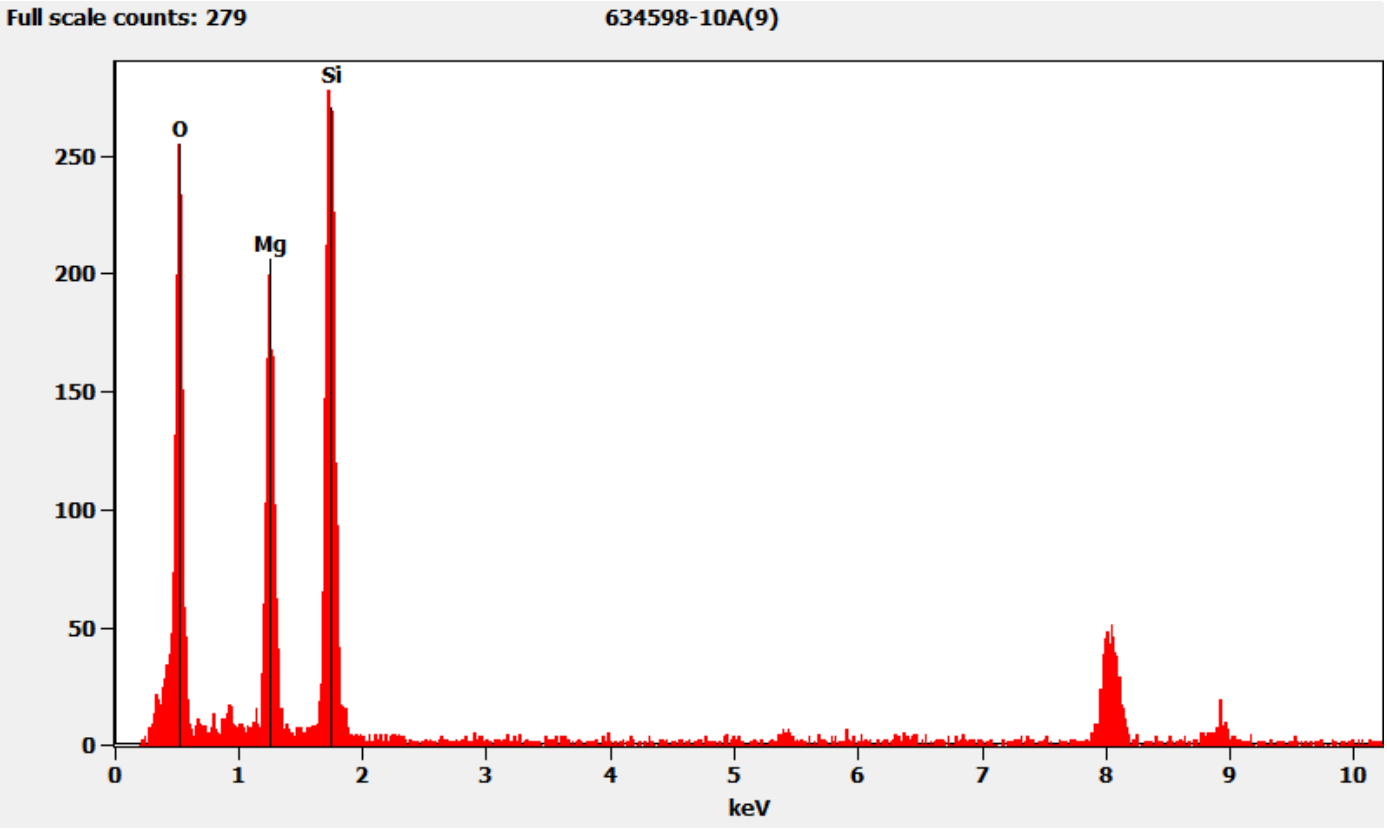


Diffraction Pattern from the Talc Ribbon Pictured Above

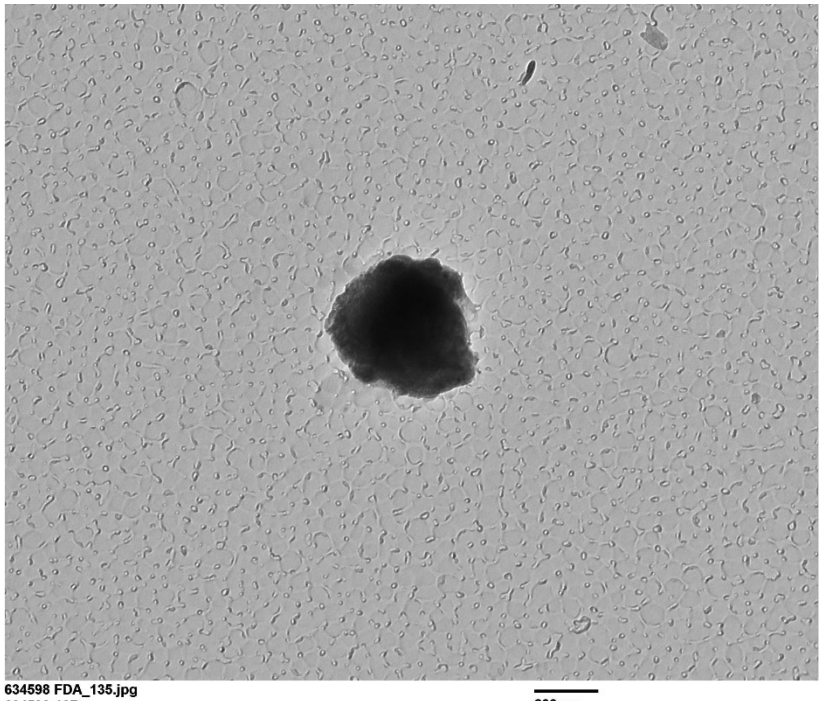
634598 FDA_122.jpg
634598-10A
Talc Ribbon
16:57 4/20/2022
Microscopist (b) (6)
Camera: NANOSPRIS, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-10B, Iron Particle



634598 FDA_135.jpg
634598-10B
Fe Particle
Cal: 0.001030 µm/pix
15:03 4/25/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

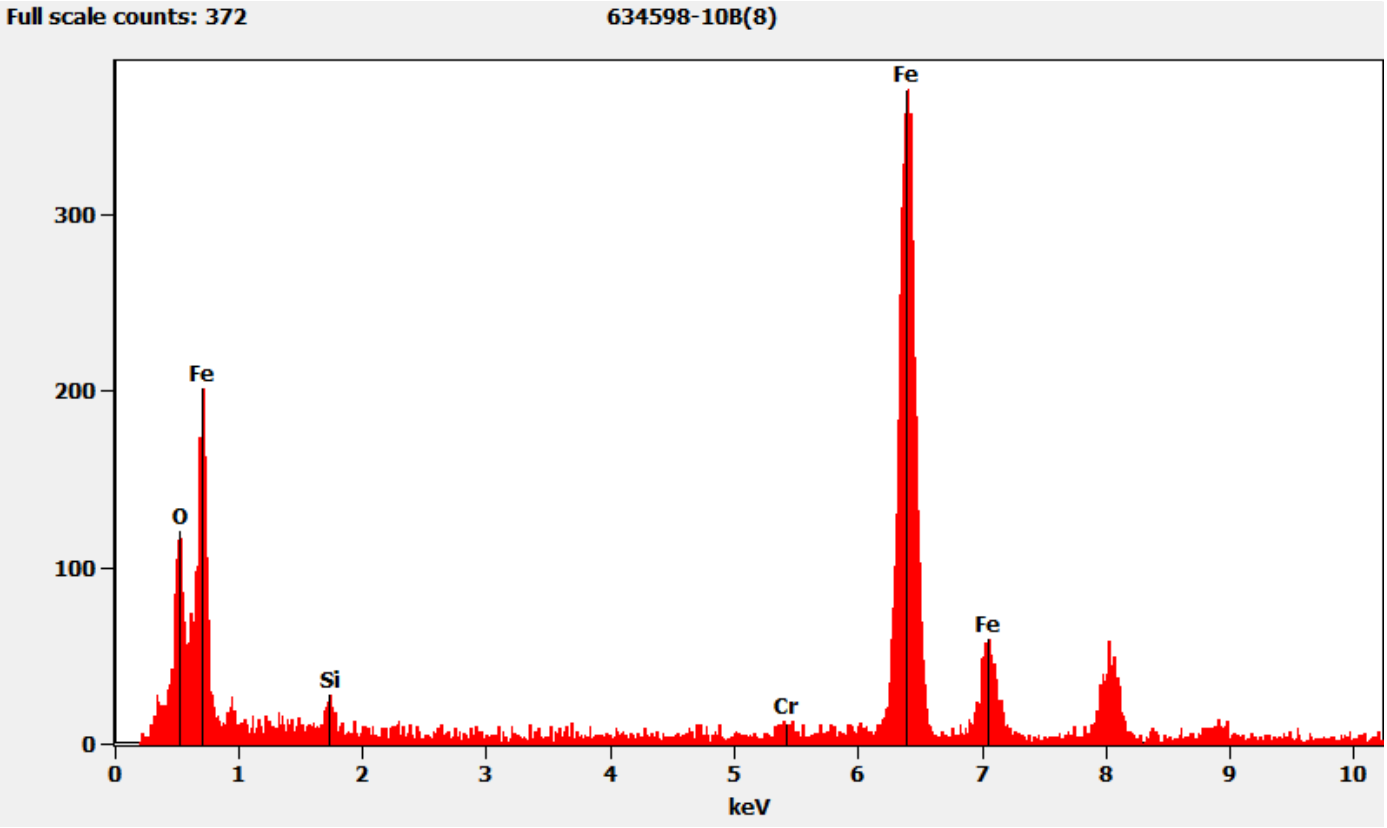
200 nm
HV=100kV
Direct Mag: 10000 x
AMA Analytical Services, Inc

Diffraction Pattern from the Iron Particle Pictured Above

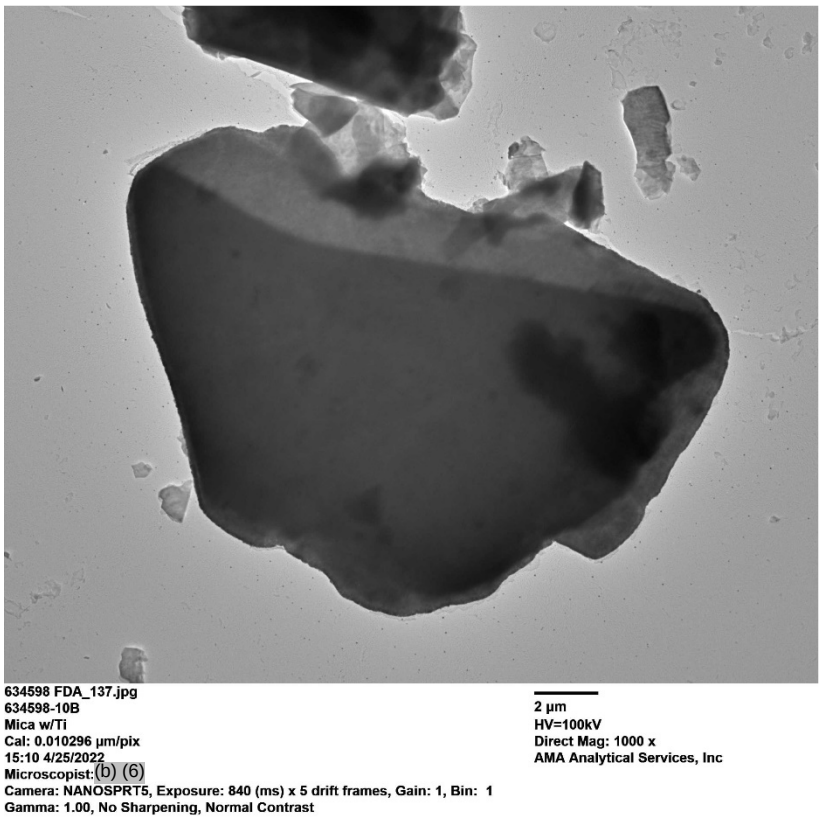
634598 FDA_134.jpg
634598-10B
Fe Particle
15:02 4/25/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Iron Particle Pictured Above



634598-10B, Mica Particle with Titanium

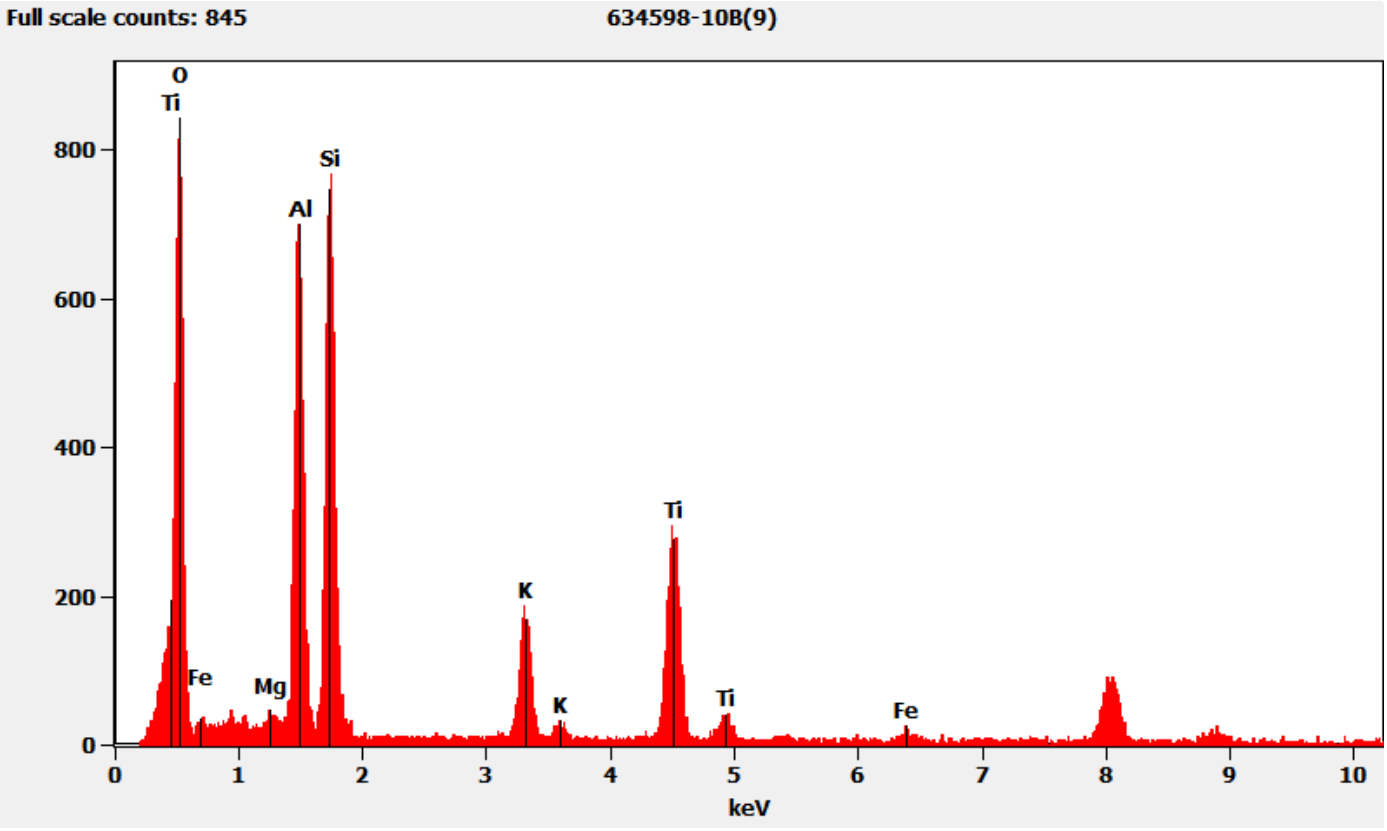


Diffraction Pattern from the Mica Particle with Titanium Pictured Above

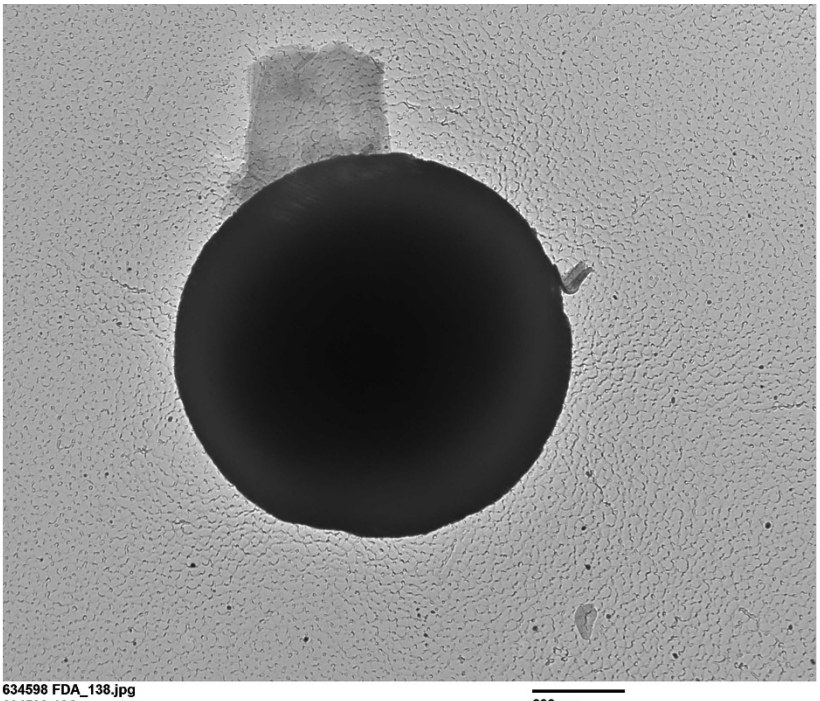
634598 FDA_136.jpg
634598-10B
Mica w/Ti
15:08 4/25/2022
Microscopis (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

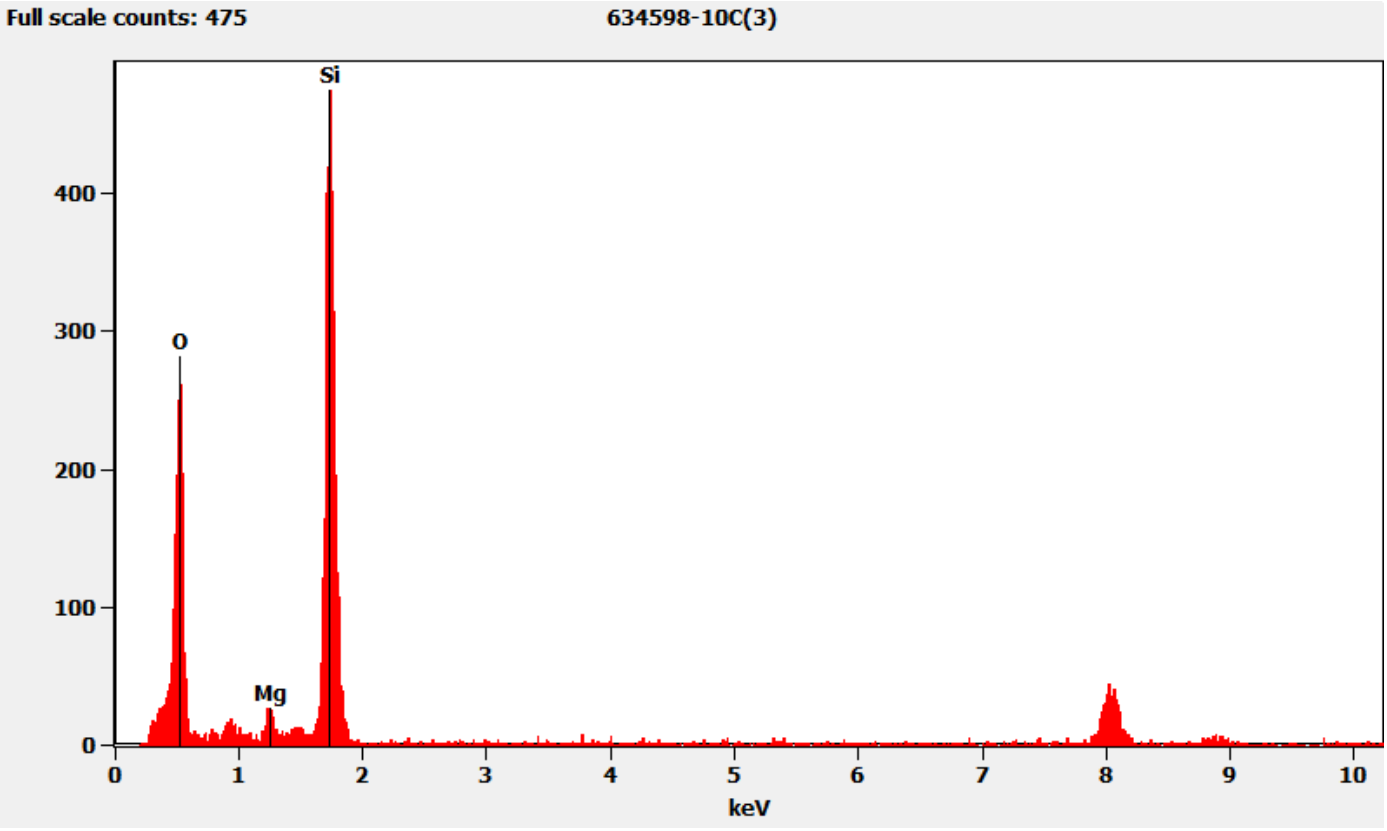
Chemistry from the Mica Particle with Titanium Pictured Above



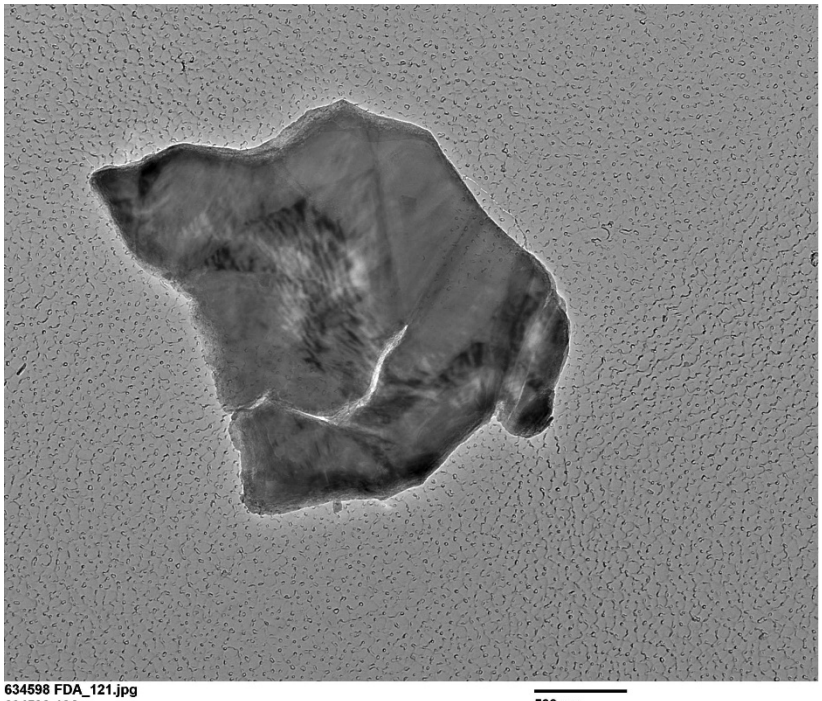
634598-10C, Silica Sphere



Chemistry from the Silica Sphere Pictured Above



634598-10A, Particle Containing Magnesium, Aluminum, and Silicon



634598 FDA_121.jpg
634598-10A
Mg,Al,Si particle
Cal: 0.001775 µm/pix
16:35 4/20/2022
Microscopis(b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

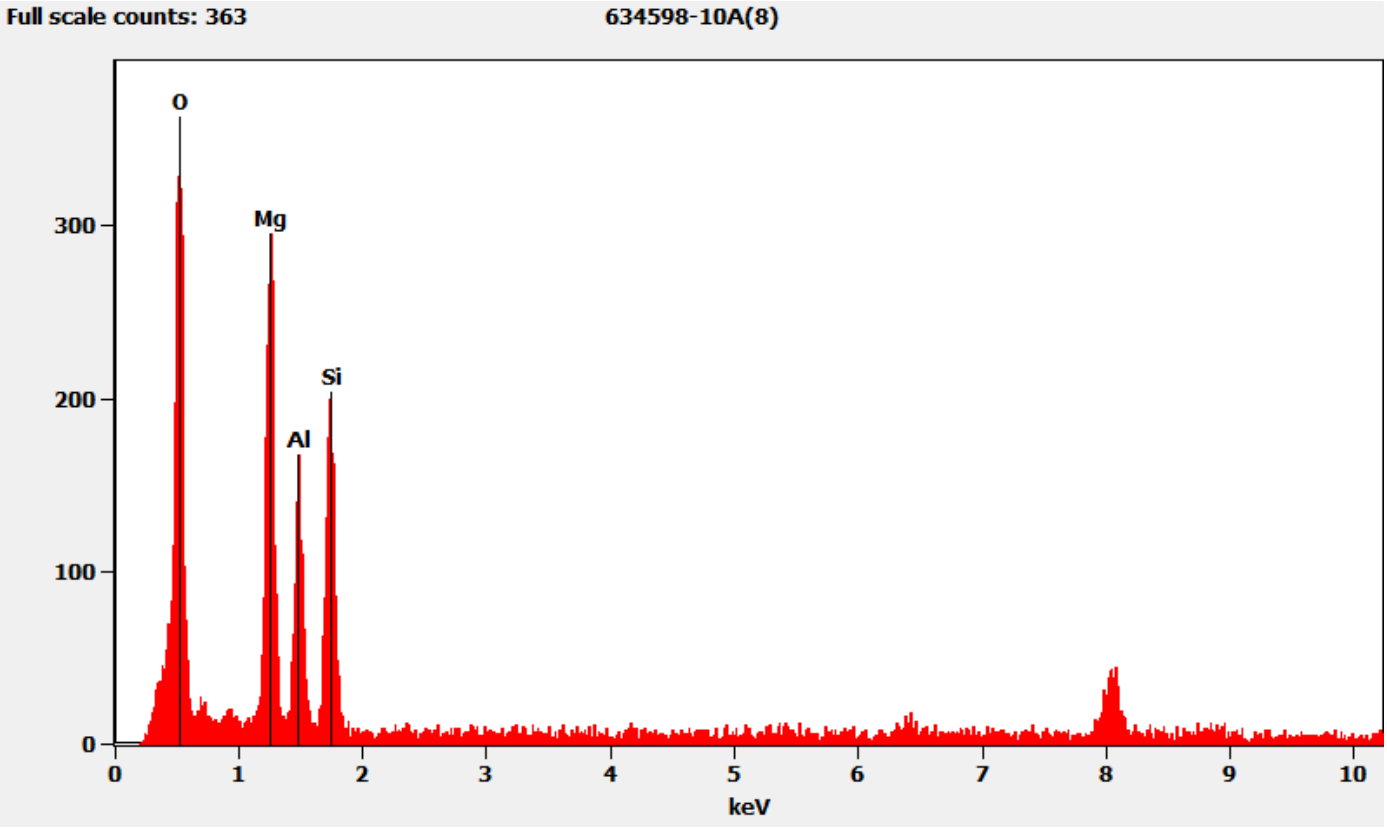
500 nm
HV=100kV
Direct Mag: 5800 x
AMA Analytical Services, Inc

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

634598 FDA_120.jpg
634598-10A
Mg,Al,Si particle
16:34 4/20/2022
Microscopist(b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

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



634598-11A, 11B, 11C/Client Sample: 03022022-11

PLM

All three aliquots of sample 03022022-11 were analyzed by (b) (6) on April 28, 2022. No asbestos or non-asbestos amphibole variants were observed during analysis. The results were calculated using the equations detailed in the *Calculations* section above.

634598-11A	No Asbestos Detected
634598-11B	No Asbestos Detected
634598-11C	No Asbestos Detected

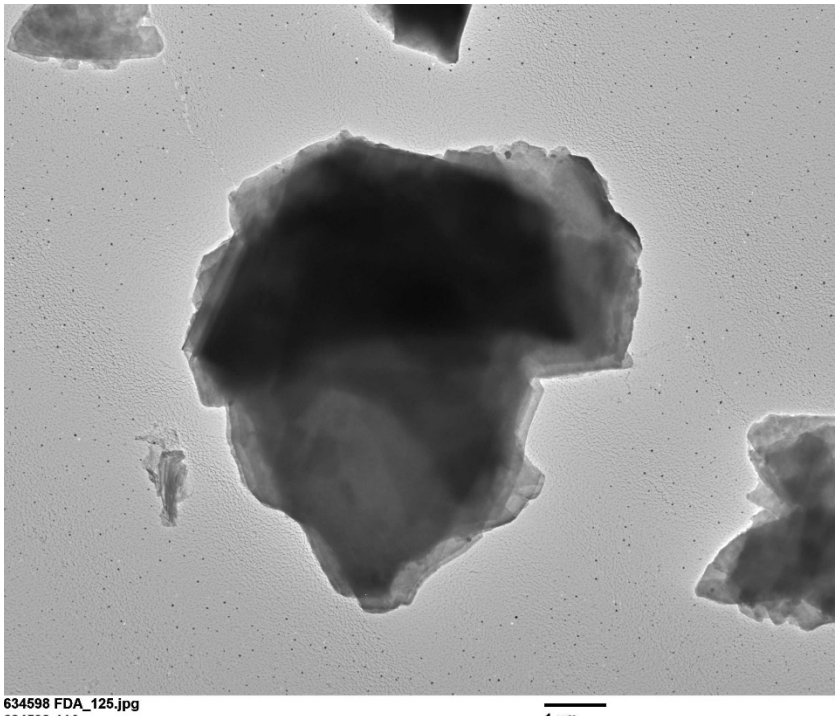
TEM

(b) (6) analyzed aliquot 11A on April 21, 2022, aliquot 11B on April 25, 2022, and aliquot 11C on April 25, 2022, through April 26, 2022. The primary particles observed were talc and mica; mica particles with titanium were also observed along with talc ribbons and elongated 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.

634598-11A	No Asbestos Detected
634598-11B	No Asbestos Detected
634598-11C	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

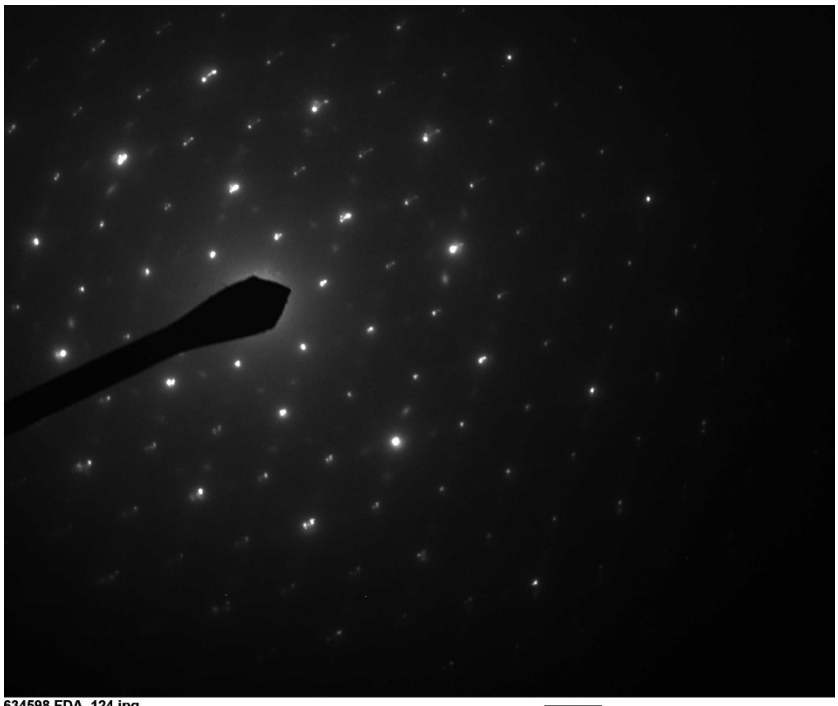
634598-11A, Talc Particle



634598 FDA_125.jpg
634598-11A
Talc Particle
Cal: 0.005419 µm/pix
10:53 4/21/2022
Camera: NANOSPRT5, 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
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Talc Particle Pictured Above

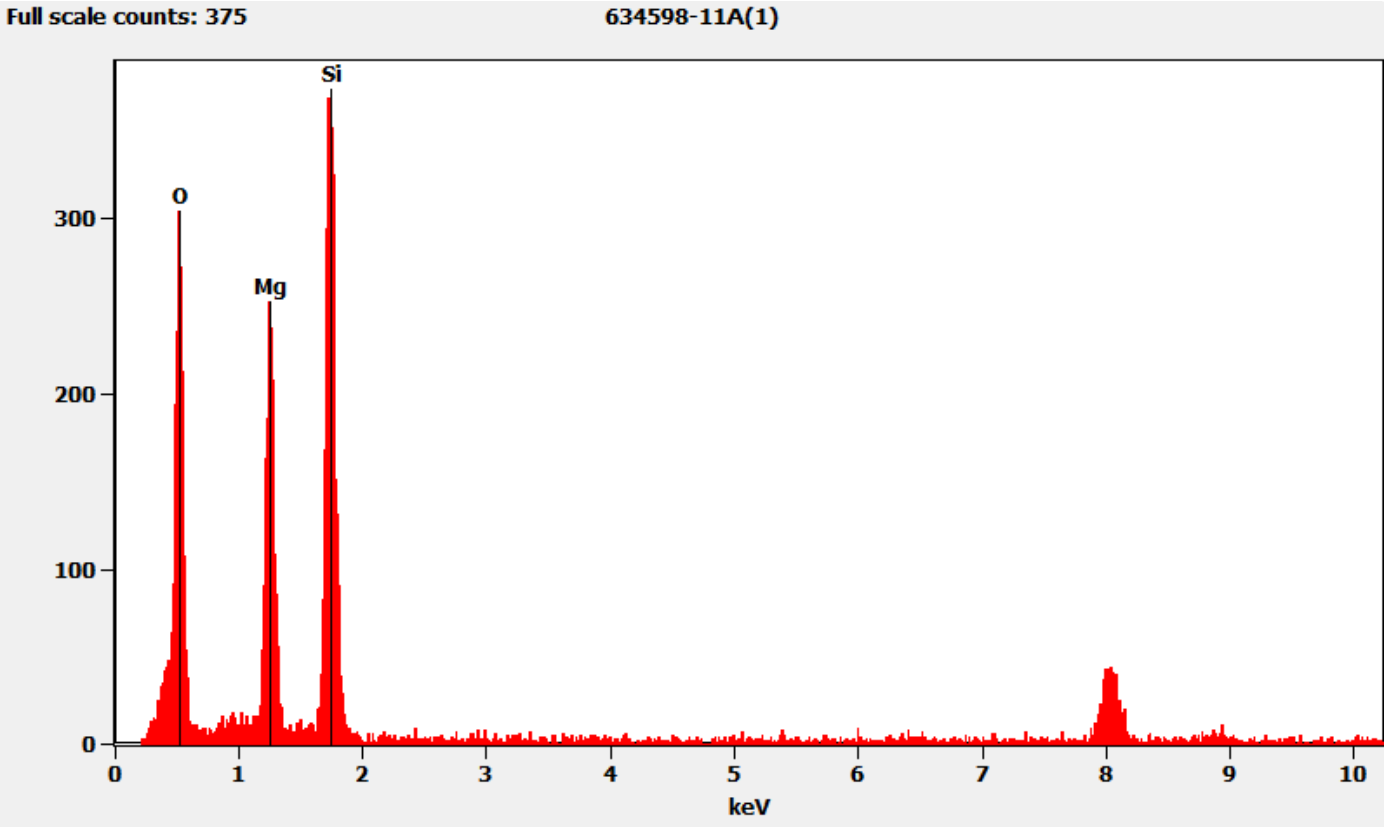


634598 FDA_124.jpg
634598-11A
Talc Particle
10:52 4/21/2022

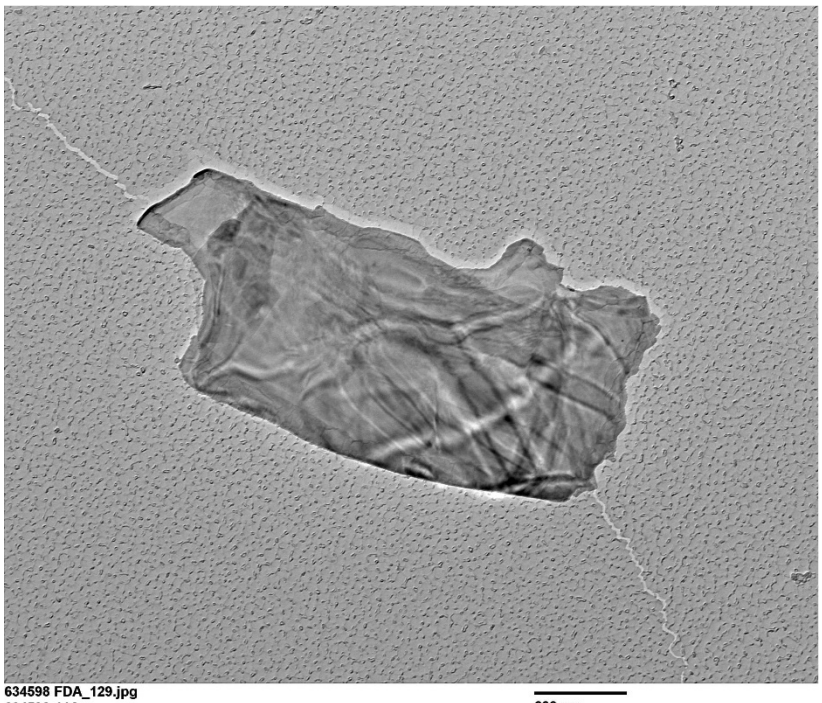
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Particle Pictured Above



634598-11A, Mica Particle

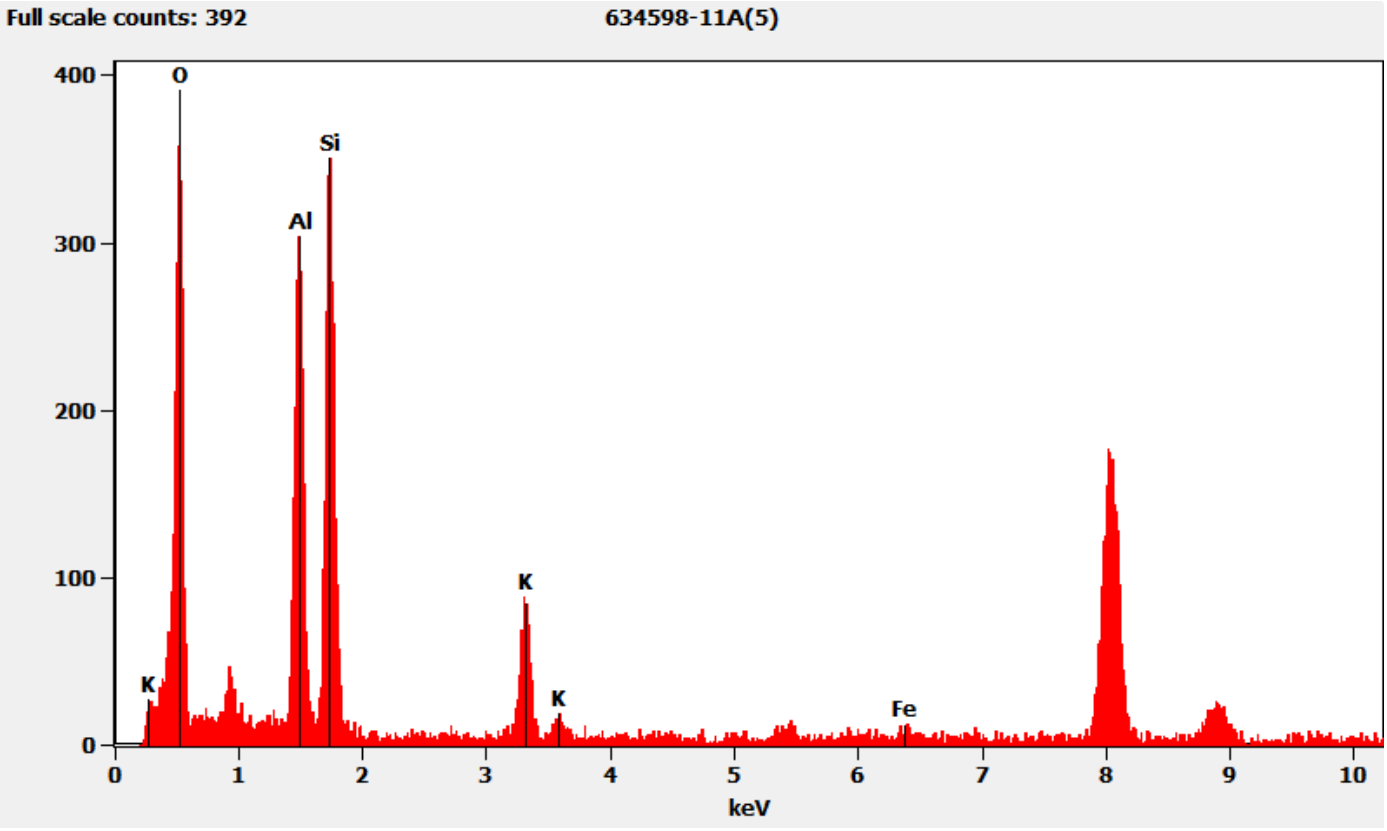


Hexagonal Diffraction Pattern from the Mica Particle Pictured Above

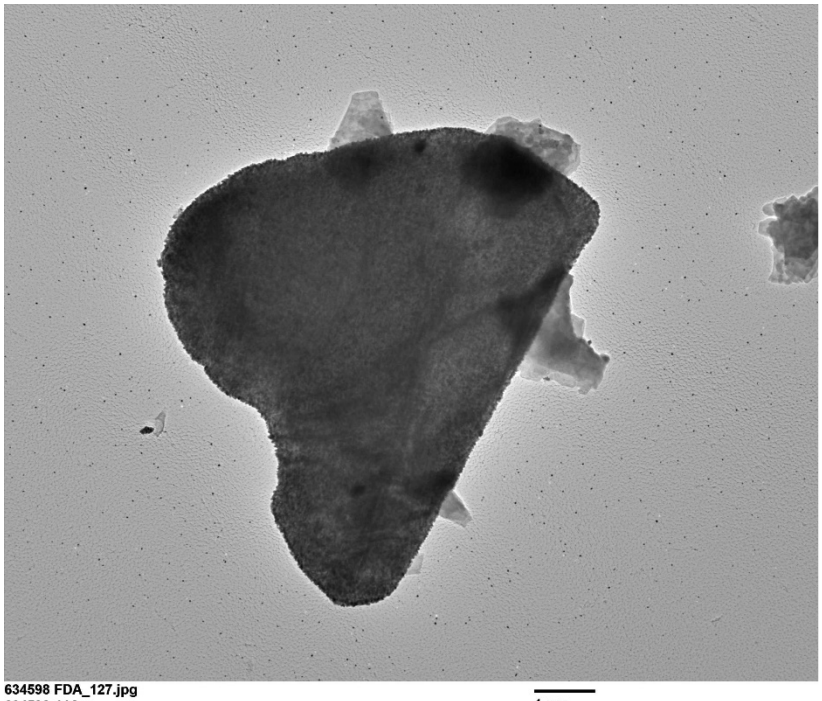
634598 FDA_128.jpg
634598-11A
Mica particle
11:01 4/21/2022
Microscopist (b) (6)
Camera: NANOSPR 15, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle Pictured Above



634598-11A, Mica Particle with Titanium



634598 FDA_127.jpg
634598-11A
Mica w/ Ti
Cal: 0.005419 µm/pix
10:55 4/21/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

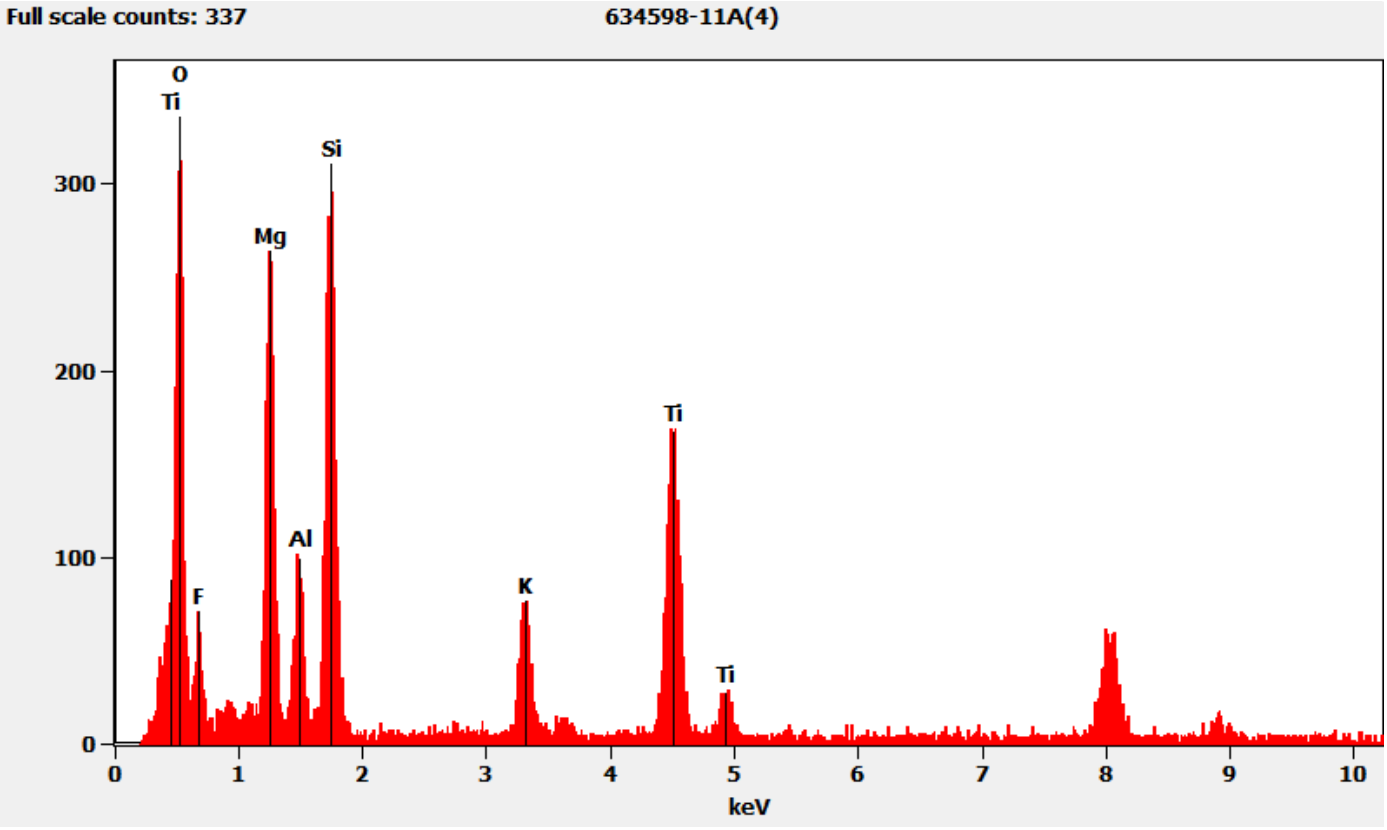
1 µm
HV=100kV
Direct Mag: 1900 x
AMA Analytical Services, Inc

Diffraction Pattern from the Mica Particle with Titanium Pictured Above

634598 FDA_126.jpg
634598-11A
Mica w/ Ti
10:54 4/21/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 std. frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Mica Particle with Titanium Pictured Above



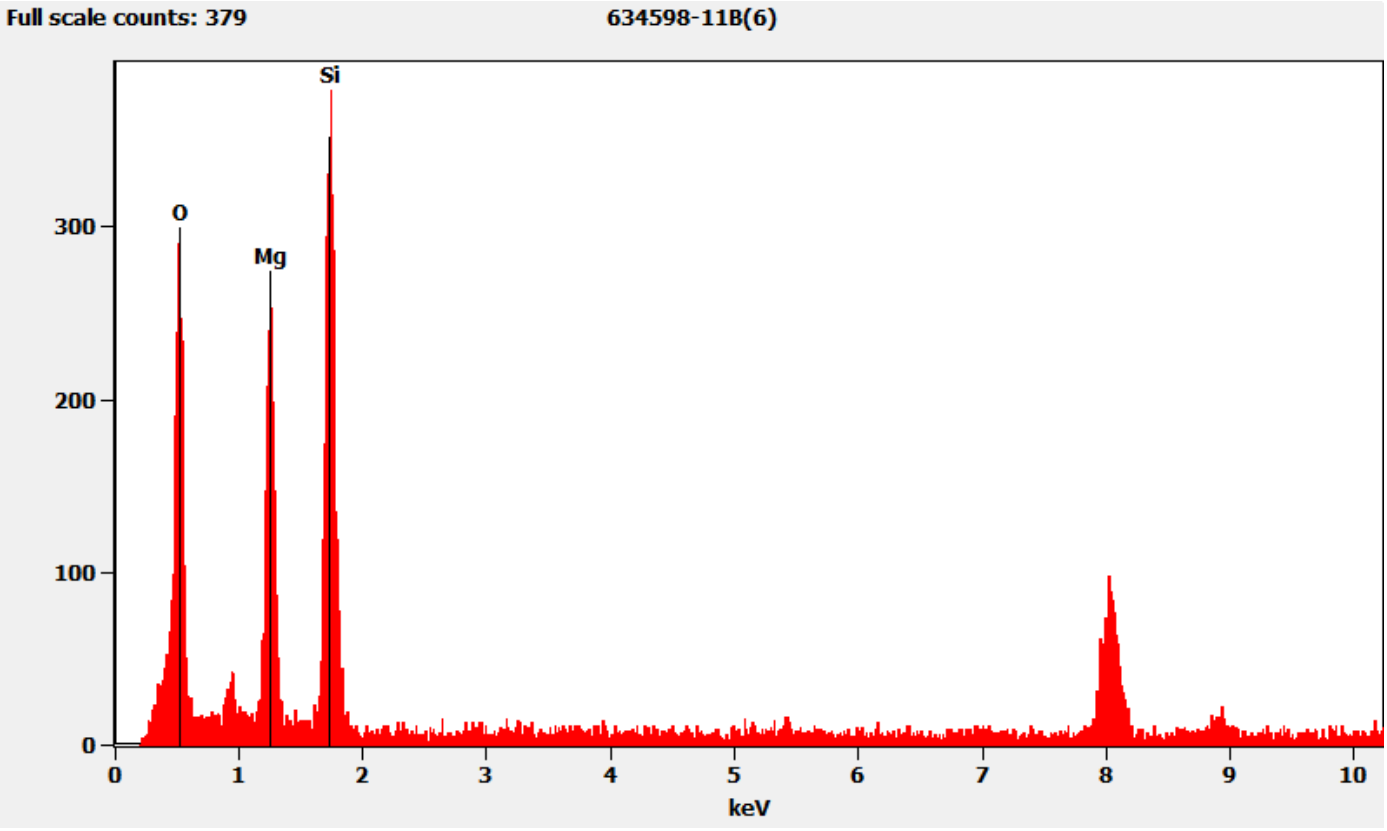
634598-11B, Talc Ribbon

Diffraction Pattern from the Talc Ribbon Pictured Above

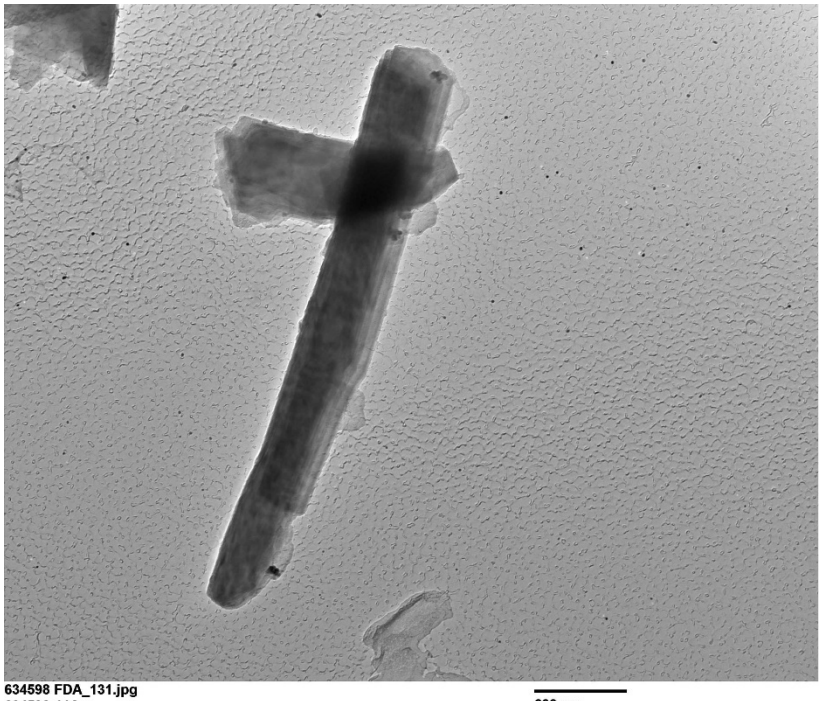
634598 FDA_139.jpg
634598-11B
Talc Ribbon
18:50 4/25/20[illegible]
Microscopist (b) (6)
Camera: NANOSPR[illegible]5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

Chemistry from the Talc Ribbon Pictured Above



634598-11B, Elongated Talc Particle



634598 FDA_131.jpg
634598-11A
Talc Fiber
Cal: 0.002145 µm/pix
11:39 4/21/2022
Microscopist (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

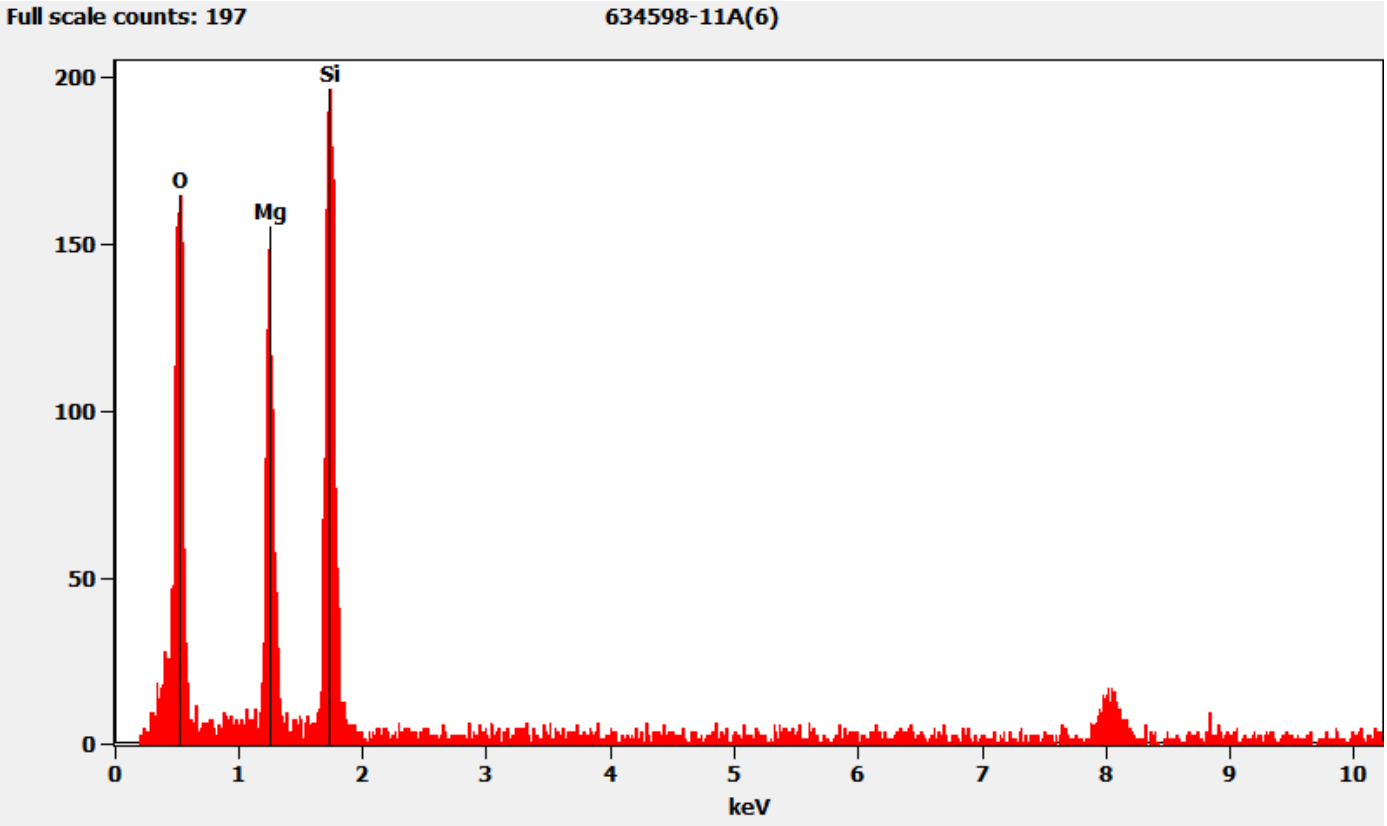
600 nm
HV=100kV
Direct Mag: 4800 x
AMA Analytical Services, Inc

Hexagonal Diffraction Pattern from the Elongated Talc Particle Pictured Above

634598 FDA_130.jpg
634598-11A
Talc Fiber
11:37 4/21/2022
Microscopis (b) (6)
Camera: NANOSPRT5, Exposure: 840 (ms) x 5 drift frames, Gain: 1, Bin: 1
Gamma: 1.00, No Sharpening, Normal Contrast

100 (1/Å)
HV=100kV
Cam Len: 0.2200 m
AMA Analytical Services, Inc

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. The matrix blank samples associated with the PLM preparations, numbers NB22-220, NB22-228, and NB22-235, were not analyzed since no asbestos was observed on the associated client samples. Although it was not required, (b) (6) analyzed the matrix blank samples associated with the TEM preparations, numbers NB22-219, NB22-227, and NB22-234, on April 26, 2022; no asbestos was observed on the matrix blank samples.

A talc reference control sample was randomly selected from our library of TEM grid preparations made from Sigma-Aldrich Talc Powder, <10 micron (Product No. 643604-500G; Batch No. 10830AJ) spiked with various levels of Chrysotile ranging from 0.4%-10%. One (1) reference control sample, sample number 634598-RB1, was analyzed with this set. It was analyzed by (b) (6) on April 26, 2022, and found to be within acceptable limits.

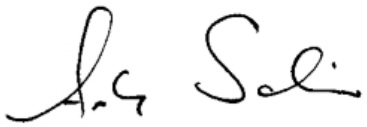
Filtration blank samples were prepared alongside the client samples with each use of the filtration apparatus. Analysis of these samples was only required on those blanks associated with a client sample on which asbestos, or the non-asbestos versions of the regulated minerals, was found unless otherwise noted. Filtration blank sample numbers DI-Blank-01 through DI-Blank-11 were not analyzed since no asbestos was observed on the associated client samples.

TEM grid preparation (EB) blank samples were prepared with each batch of carbon coated filters. AMA policy is to analyze these blank samples whenever asbestos, or the non-asbestos versions of the regulated minerals, is detected on an associated client sample or when the laboratory blank identification number ends in a "0" or "5." Since no asbestos was observed on any of the client samples, only EB Blank IDs 58210, 58230, and 58290 were analyzed. (b) (6) analyzed EB-58230 and EB-58290 on April 26, 2022, and EB-58210 on August 3, 2022. No asbestos was detected on the TEM grid preparation blank samples.

Our laboratory information management system (LIMS) randomly selected sample 634598-4A/03022022-4 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 April 28, 2022, for PLM. The QC results were consistent with the original findings. (b) (6) AMA prior to analyzing the TEM duplicate QC sample, therefore only the PLM analysis was duplicated for this sample.

Our laboratory information management system (LIMS) randomly selected samples 634598-3A/03022022-3 and for additional replicate QC analysis. Independent preparations were made for the PLM and TEM portions of analysis. The replicate QC analysis was performed by (b) (6) on August 2, 2022, for PLM and by (b) (6) on August 3, 2022, for TEM. The QC results were consistent with the original findings.

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



8/4/2022

Andreas Saldivar — Date
President