

Conservation ID: CL1.1990.597

Object ID: 1990.504

Object Synopsis: figure | Creche | Shepherd (creche figure) | unknown maker | Ecuador | wood | paint | 18th century | CS-94-86 | SS-551 | S-0422 | 1990.671 | 1990.504

Overview/Purpose Tab

Date of Initiation: 5/10/2021

Primary Conservator: Emily Brzezinski

Purpose:

Type of Record: Treatment

Due Date: 7/1/2021

Other staff: Aaron Burgess

Examination Tab

Exam Date	Conservator
5/10/2021	Emily Brzezinski

Conservation Medium: Carved wood, polychrome

Object Description: The object is a figure of a kneeling shepherd carrying a white sheep over his shoulders. There is a thick, off-white ground layer under a thick, matte painted surface. No wooden joins are visible beneath the ground or paint. The shepherd wears a green cloak, red pants, with longer hair and facial hair in an 18th century Spanish style.

Condition Description: The object is in fair, stable condition.

The proper right foot is missing just above the ankle. The break edge exhibits old adhesive, suggesting the break is at an original join or previous repair. The figure is somewhat unstable due to the loss of the foot.

There are scattered insect bore holes overall, especially on the head and proper right arm. The visible wood beneath is very soft and worn, but no signs of fresh frass or holes are evident suggesting that there is no active infestation. There are losses to the paint, ground, and wood around bore holes on the proper right index finger and wrist, likely from insect grazing. These areas are unstable.

There are scattered losses to the paint and ground overall, especially on the underside of the legs and feet. Many of these areas are flaking and unstable.

There is degraded museum wax on the underside of both knees.

There are heavy abrasions to the paint and ground overall.

There is heavy surface grime on all surfaces, especially the sheep, hands, neck, and head.

Proposal Tab

Proposal Date: 5/12/2021

Conservator: Emily Brzezinski

- Proposal:
1. Photograph the object before treatment in normal and ultraviolet illumination.
 2. Clean all surfaces using appropriate dry methods, such as a variable-speed vacuum and natural bristle brush.
 3. Reduce surface grime using an appropriate wet cleaning method. Cleaning should not disrupt any paint layers and will likely be aqueous-based.
 4. Mechanically remove the old museum wax from the underside of the knees. Utilize solvents applied with cotton swabs, if necessary.
 5. Consolidate unstable paint and ground with an appropriate adhesive, likely aqueous-based.

7/25/2021

6. Fill the losses to the proper right finger and wrist. This will stabilize the areas and prevent further loss to the unstable wood, ground, and paint.
7. Reconstruct the missing foot using a reversible, moldable material. Remove old adhesive and clean break edge before repair.
8. Inpaint the fills to the proper right hand and foot to visually integrate the repairs.
9. Photograph the object after treatment in normal illumination.

Est. Hours: 28.00

Approved By:
Approved Date:
Approved Notes:

Treatment Tab

Start Date: 5/10/2021 Done Date: 7/7/2021 Conservator: Emily Brzezinski

Treatment Report: 1. The object was photographed before treatment in normal and ultraviolet light.

2. Surface cleaning (6.25 hr)

- Several aqueous solutions were tested for surface cleaning, including deionized water, a mild enzymatic solution, 2% Triammonium citrate in deionized water at pH8, Ecosurf EH-3 in deionized water at approximately 4CMC (0.4g/100mL), "Storr's Solvent" containing Triton XL-90, citrate, and TEA at pH 8 in deionized water. All cleaning tests were cleared with deionized water.

- Areas were cleaned according to color, with each solution tested before cleaning and rinsed with deionized water.

- Lamb: Initially cleaned with Ecosurf EH-3, then switched to deionized water to avoid potential paint removal

- Hair: Ecosurf EH-3

- Face and neck: Triammonium citrate

- Green cloak: Triammonium citrate

- Blue trim on cloak and upper legs: Deionized water, with light cleaning with slightly damp swabs

- Lower legs: Deionized water, halted.

- Cleaning was halted on the legs part way through the process. Only the outer side of the proper left leg, and part of the outer side of the proper right leg was cleaned. During cleaning, it became unclear whether the deionized water was removing surface grime or the paint itself. The used swabs in other areas of the sculpture appeared yellow-brown due to the heavy surface grime, and initially it appeared that the deionized water was removed a similar grime on the legs. However, as cleaning progressed it seemed possible that the yellow color was actually paint (or another intentional coating) that appeared to be a similar color to the other surface grime. Additionally, several yellow drops were located, which suggested paint. Cleaning was halted at this point, and the yellow material was analyzed (discussed below in Step 7).

3. Lifting or flaking paint or areas of paint loss were consolidated with 10% Aquazol 500 in deionized water, applied with a thin brush. The consolidate was allowed to flow beneath the surface via capillary action. (0.5 hrs)

4. Larger losses were first consolidated with 10% Aquazol 500 in deionized water and filled with Modostuc. (1 hr)

5. Replacing the missing foot (12 hrs)

- The old adhesive was softened with DI water and removed mechanically.
- A barrier layer of high tack fish glue diluted with deionized water was applied to the wooden break edge . This reinforced and consolidated the soft wood of the break edge.
- Once dry, an additional barrier layer of 5% Paraloid B72 in acetone was applied over the fish glue. The Paraloid B72 isolated the water-soluble fish glue and the water-soluble materials suitable for remolding the fingers.
- A small hole was drilled into the leg at the center of the break edge so a bamboo dowel could be inserted . Several previous attempts were made to mold a replacement leg away from the break edge, but these replacements did not blend visually or support the weight, and the dowel provided the necessary structural support. The dowel was held in place using high tack fish glue, and an additional barrier layer of high tack fish glue was applied over the break edge and dowel.
- Once set, Milliput epoxy putty was built up around the dowel to the general shape of the leg.
- The shape was refined using hand tools and filled with Modostuc as needed.
- The replacement foot was inpainted with Golden acrylics and Windsor Newton watercolors.

6. Inpainting (10 hrs)

- Areas of distracting paint loss were inpainted with Windsor Newton watercolors and Gamblin Conservation Colors. Gamblin Conservation Colors was used on the skin tones, while watercolors were used on the green coat, black trim, red pants, shoes, and hair.

7. The yellow color on the lower legs was analyzed with XRF, FTIR, and Raman spectroscopy. The results together suggest the yellow color is orpiment pigment in a proteinaceous binder, suggesting a paint rather than grime layer or other coating. Therefore, the partially cleaned legs were photographed, and the cleaned areas were toned to match with Windsor Newton Watercolors . See the Analysis tab for more information.

8. The object was photographed in normal light after treatment. (1.5 hrs)

Summary:

Hours: 32.00

Bibliography Tab

Bibliography: ,,,,

Pages:

Notes:

Used As:

Image Tab

Image Type:

Source:

Captured by:

Capture Date:

Web Ready?

Publication Ready?

Party Tab

Party:
 Party Role:
 Begin Date:
 End Date:
 Individual:
 Full Address:
 Title:
 Phone Number:
 Notes:

Sample/Analysis Tab

Sample/Test Areas

Number: 1990.504
 Date: 6/4/2021 12:00:00AM
 Description: Sample 1- Sample of unknown yellow coating on the lower legs.
 Location: Large droplet on the inner proper left calf. Specific location indicated in the attached document (Sample request form for the Winterthur Museum's Scientific Research and Analysis Laboratory).

Analysis

Date: 7/6/2021 12:00:00AM
 Type of Analysis: Fourier Transform Infrared Spectroscopy (FTIR)
 Sample Used: Sample 1
 Results/Notes: Binder in sample is a protenacious material. Spectra matches references for rabbit skin glue, but casein or similar material is also possible. Spectra indicates an inorganic compound, not identifiable by FTIR.

Date: 7/6/2021 12:00:00AM
 Type of Analysis: Raman Spectroscopy
 Sample Used: Sample 1
 Results/Notes: Inorganic element shown in FTIR matches closely with the spectra for orpiment, and arsenic-based yellow pigment.

Date: 6/1/2021 12:00:00AM
 Type of Analysis: X-Ray Florescence
 Sample Used: None
 Results/Notes: Inconclusive. Yellow color may contain arsenic and sulfur, indicating orpiment paint. These peaks overlap significantly with lead, obscuring the results.

Budget Estimate

Contractor/Item	Hours/Quantity	Rate/Price per Item (\$)	Subtotal (\$)
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TOTAL

Actual Costs

Contractor/Item	Hours/Quantity	Rate/Price per Item (\$)	Subtotal (\$)
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TOTAL

WINTERTHUR



THE WINTERTHUR MUSEUM SCIENTIFIC RESEARCH AND ANALYSIS LABORATORY
REQUEST FOR ANALYSIS

Instructions: This form should be completely filled out before the project and samples are accepted.

AL# _____ (to be filled out by SRAL staff)

DATE: June 4, 2021

REQUESTOR: Emily Brzezinski

ADDRESS/PHONE NUMBER:

SUPERVISOR APPROVAL:

(required for all 2nd year WUDPAC requests)

Gina Laurin glaurin@denverartmuseum.org

Aaron Burgess aburgess@denverartmuseum.org

Sarah Melching (Department Head), smelching@denverartmuseum.org

OBJECT: Polychrome shepherd figure

Owner: Denver Art Museum

Title: Shepherd (creche figure)

Date of manufacture: 1800s

Accession or ACP Number (required): 1990.504

Provenance: Ecuador

Maker/Artist: unknown

PREVIOUS ANALYSES AND RESULTS: (Use other side or attach copies of reports)

I have performed X-Ray Florescence (XRF) on the suspected ground layer, white paint, green paint, and unknown yellow coating on the legs. Generally, the XRF revealed strong calcium peaks, consistent iron, and sulfur and/or molybdenum, and lead and/or arsenic. Arsenic and sulfur suggest an arsenic-based yellow paint, but the lack of clarity makes me unsure of this attribution.

XRF Spectra attached.

JUSTIFICATION FOR ANALYSIS / PURPOSE OF ANALYSIS / PARTICULAR INTEREST:

Analysis of this sample will help characterize the yellow material and help inform my decision to either continue removing it from the surface. I have been reducing grime from the polychrome surface, and initially thought the yellow surface on the legs was heavy tobacco or soot staining present on other areas of the piece. However, as cleaning progress, I began to suspect that the yellow material was paint, varnish, or another intentionally applied material that should remain on the surface.

Consultations with coworkers, visual examination under magnification, and XRF have not helped to clarify this.

I would like to request analysis via Fourier Transform Infrared Spectroscopy and Raman Spectroscopy. Given that XRF showed a lack of metals, the yellow material could be a natural resin, discolored varnish, or ochre/oxide-based pigment. FTIR could provide more details here which would guide my next steps. Raman

could clarify the XRF results and provide additional pigment identification, if the yellow substance is an inorganic pigment. I also plan on examining a sample through polarized light microscopy.

USE OF INFORMATION:

There are no plans to publish or share this information, although any results will be saved in the object file on the Denver Art Museum's database.

Is publication or other sharing of this information outside of Winterthur Museum (exhibits, catalogs, etc) possible or anticipated? If so, where or with whom?

If so, please note that Analytical staff must be *properly acknowledged and permission to publish analytical data must be obtained* from the Director of Conservation.

A photograph or clearly drawn diagrams of object with sample locations marked must be submitted with this request.

Samples removed by: Emily Brzezinski

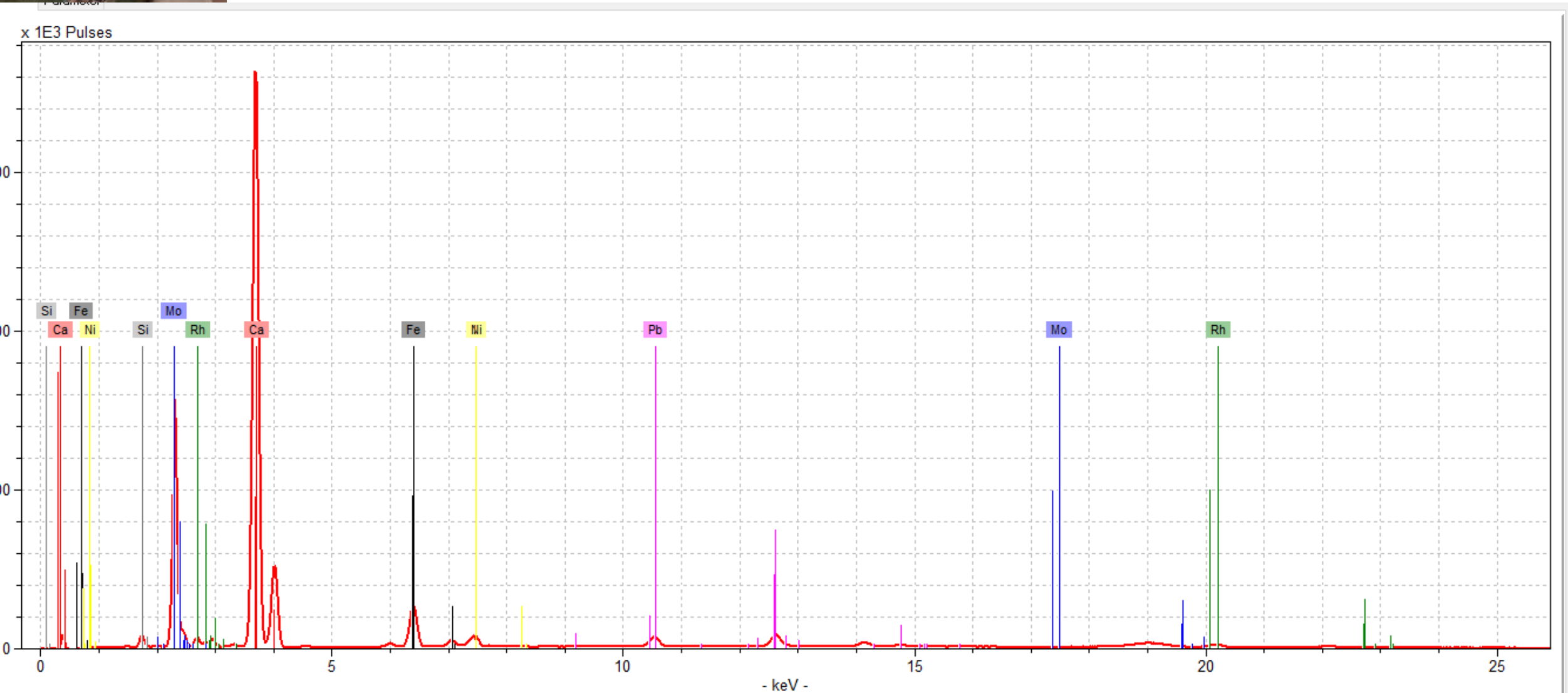
Date:

Sample: Unknown yellowed material from a large drop on the figure's calves. Sample location indicated with wooden skewer in right hand image.



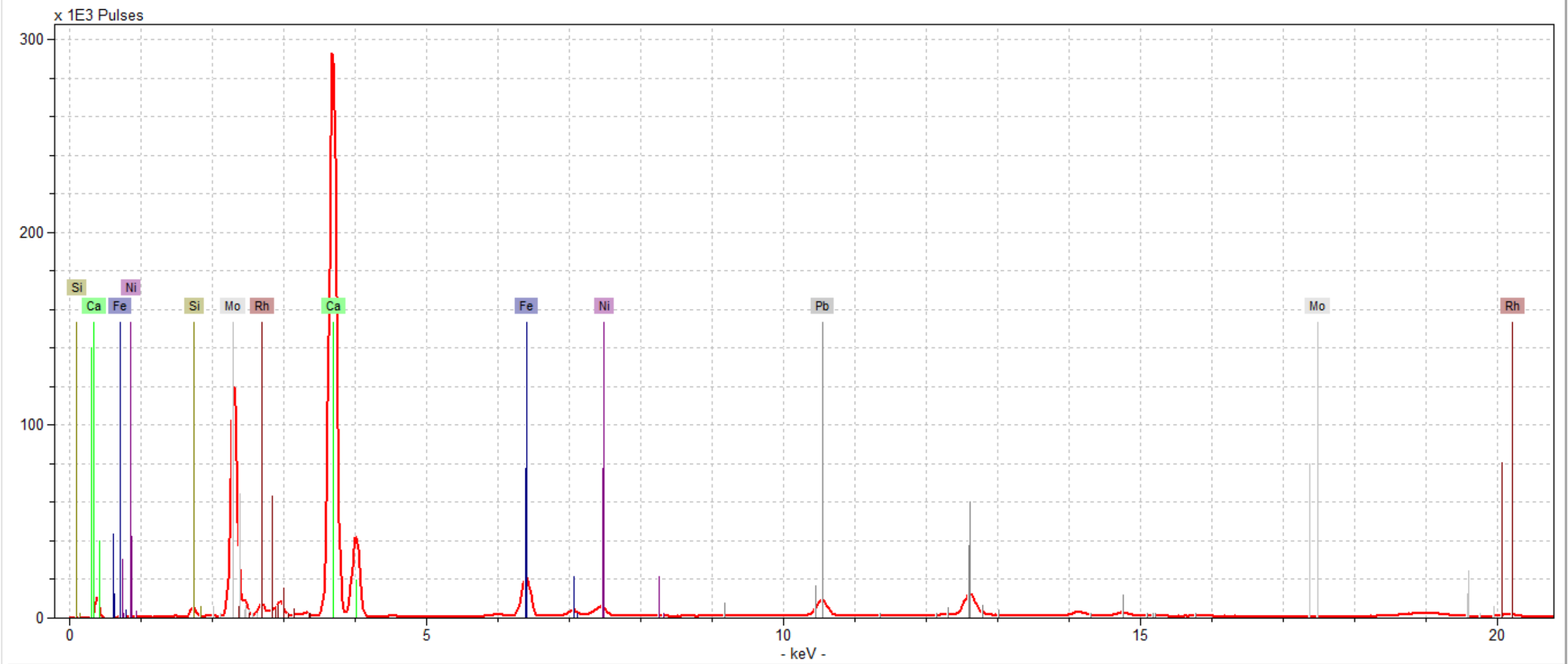


1990.504 Shepherd Figure, Sample 1: Back of sheep, suspected ground



6/4/21: Environment: air/no vacuum, 40kV, 60sec, 15 uA

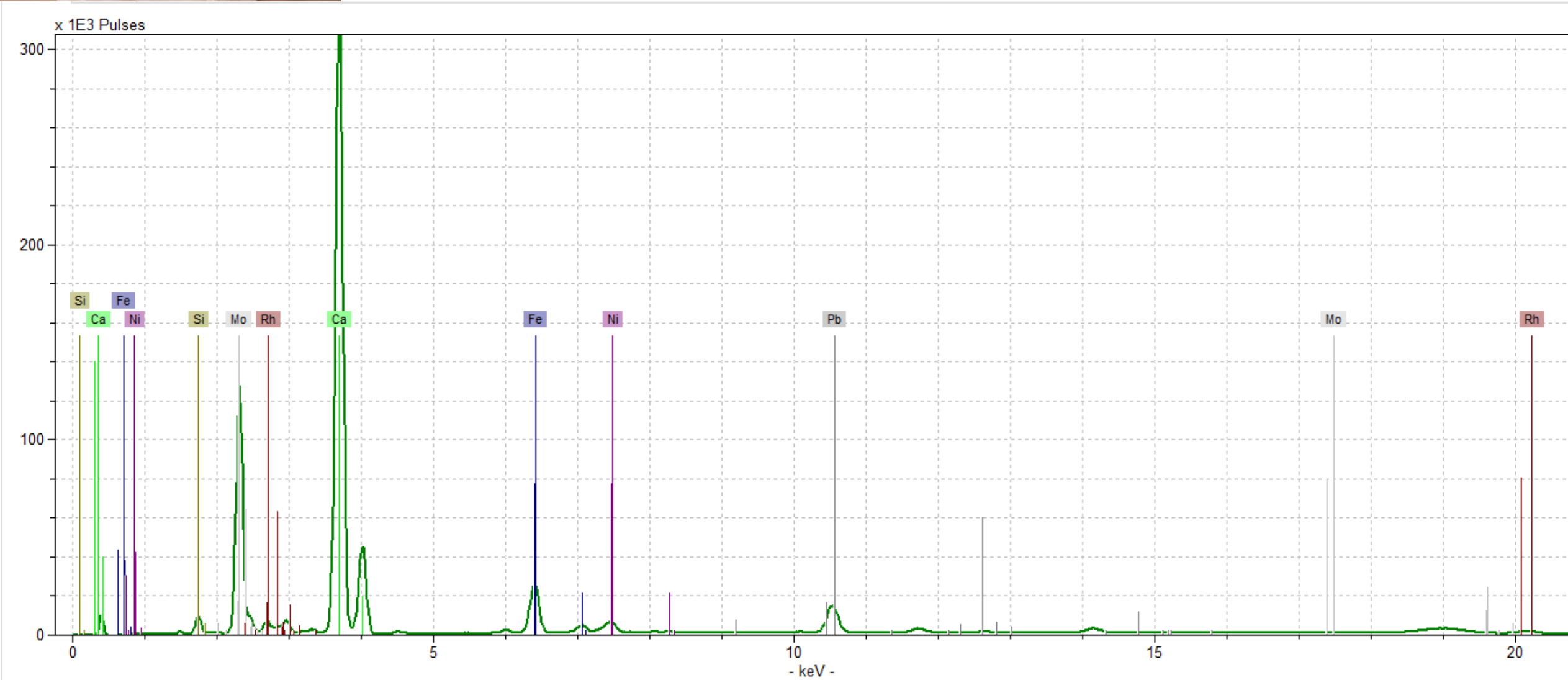
1990.504 Shepherd Figure Sample 2: back of sheep, white paint



6/4/21: Environment: air/no vacuum, 40kV, 60sec, 15 uA



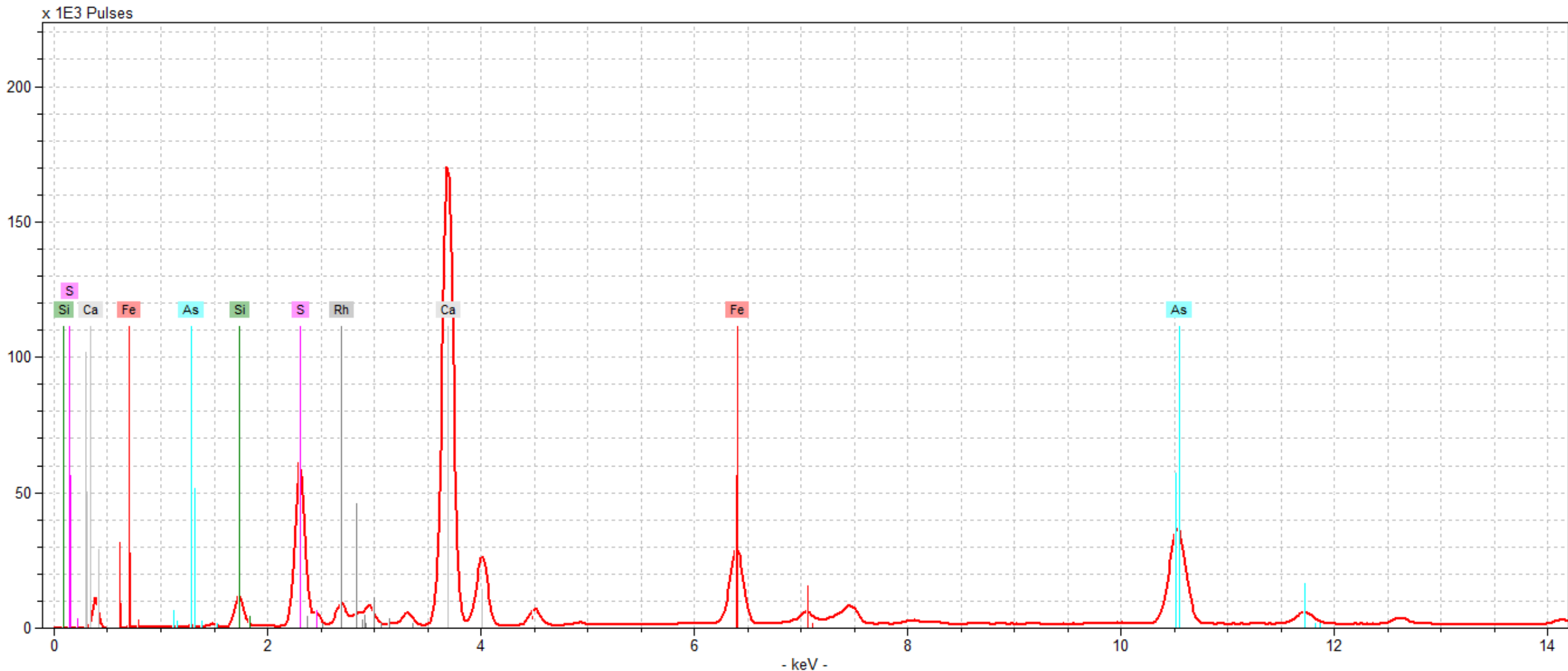
1990.504 Shepherd Figure Sample 3: Proper Left shin, suspected ground



6/4/21: Environment: air/no vacuum, 40kV, 60sec, 15 uA



1990.504 Shepherd Figure Sample 4: Proper Right ankle, yellow color





1990.504 Shepherd Figure Sample 6: Center of back, green

