Frontier Analysis, Ltd

TECHNICAL SERVICE RESPONSE NO.: UT026

Subject: Analysis of Samples Related to an Alleged Abduction in Corguinho, Brazil on September 15, 2002

Date: April 22, 2003

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Background/Objective:

The alleged Corguinho, Brazil abduction event occurred on September 15, 2002. Briefly[1], several days before the event, Urandir Oliveira said he had received telepathic information that he would be transported aboard an alien craft on September 15th by 10 p.m. This would be heralded by "a rain of rocks" lasting seven minutes. Just after 7 p.m. on this date, a stone drop did occur. Urandir, lying on his bed in undershorts and anticipating the event, and was suddenly enveloped in a violet flash. His body sensed an increase in temperature which he described as "fever". He became paralyzed, and in essence was beamed up through the ceiling to a waiting craft. As a result of this beam up his body image was imprinted into the bedding[2]. The body image on the sheet visually appears to consist of 1) burned areas and 2) halo-like areas. (See photograph on page 3.) Furthermore, a charred appearing image shows up on the ceiling wood. The objective is to analyze bedding fragments and the falling stones associated with this event[3].

[1] A detailed account of this event can be found on www.Earthfiles.com
[2] It is interesting that Urandir's underwear did not suffer damage.
[3] It is not known whether the roof tiles or other materials through which the alleged transport would have passed through were affected.

Conclusions:

1.) Bedding material compositions follow. The cotton sheet is composed of cotton cross woven with poly(ethylene terephthalate), i.e. PET. The mattress pad consists of three components: a 'stuffing' composed of a polyether urethane, PPO;[4] material stitched to the cover is woven PET; a stiff brown material associated with the pad is a woven blend of cotton/PET (as opposed to individual filaments of cotton and PET). The pillow, like the sheet, is composed of cotton cross woven with PET.

2.) Both burned areas and halo areas of the image-imprinted bedding have been exposed to heat. Also, the analysis suggests the sheet halo areas were exposed to either a lower temperature and/or shorter heat contact time compared to the burned area. This conclusion is supported by the observation that the cotton is degraded in the burned areas, but remains intact in the halo areas. It is also noted that PET is melted in both image areas. However, it remains "in place" in the halo areas, and has experienced "flow" in the burned areas. No evidence for PET degradation is detected in either image area.

3.) An observation that the halo area of the sheet consists of melted PET and undegraded cotton is not an anomaly, though it is noted PET has a melting range between 250-265°C (482-509 °F) and cotton degrades at 148°C (298 °F). This can be explained by the differences in rates of heat conduction (Thermal Conductivity) of these materials. PET (0.147 W/m*K) conducts heat faster than cotton (0.071 W/m*K)[5]. Therefore, a fast burst of heat (above the melting point of PET) would melt the PET but not degrade the cotton. This was experimentally accomplished with an iron on the control sheet swath by this laboratory.

4.) No unusual residues were solvent extracted from the image area of the sheet bedding. In fact, more materials were extracted from the controls than the image areas. Residues detected in both the image and control sheets include: poly(dimethylsiloxane) which is probably from sizing, a natural ester, celluloidal, and protein-like material. Additionally detected in the controls were alkyl aryl sulfonate, most likely from residual laundry detergent, and inorganic carbonate. It is speculated these later two materials were not in the image area due to decomposition from the heat.

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[4] PPO = the polyether, polypropylene oxide.

[5] Note (June 30, 2003): These values are different than those in the report that was issued April 22, 2003. The original values indicated PET conducts heat ten times faster than cotton. They were obtained from the Internet and the values are of PET fiber compared to cotton wool. Since then, this analyst has noted the above reported values in a recently acquired book: Immergut's Polymer Handbook, 4th Ed. John Wiley & Sons, 1999. This is essentially the polymer chemist's "Bible". The values reported are from very similar forms of cotton and PET and more representative. They still clearly show that PET conducts heat faster than cotton.

5.) The stones are an agglomerate of minerals which have a sedimentary origin. Specifically identified is a major amount of quartz (SiO_2) which is commonly present in sand and sand stone. Another major mineral is present with similarities to montmorillonite [$(Na,Ca)_{0.33}(Al,Mg)_2Si_4O_{10}(OH)_2$]. This mineral occurs in clay deposits, soils and sedimentary and metamorphic rocks. Iron is present and probably in oxide form. A very small amount of inorganic carbonate is also suggested which is likely in the form of calcite. Qualitatively both exterior and interior of the stone contain the same components, however quantitatively there is more quartz, and probably iron oxide, on the exterior of the stone. XRD (X-ray Diffraction) analysis is recommended for further analysis of the stones.

The stones are very similar to Moqui Marbles, a.k.a. Boji stones, "Moki" Marbles, Moko Balls, Ironstone Concretions, Navajo Cherries, Indian Marbles, Shaman Stones, etc. Moqui Marbles consist of an outer shell of hematite (iron oxide) with a center of sandstone. The sandstone center is often stained red and/or yellow from iron oxides. Occasionally there are additional rings of hematite in the center.[6] " Avalon Foundation contributes: "They are formed much like pearls, by accretion of minerals from the water supply around a core that can be anything from a sand grain to a small rock." "They are typically found in sandstone or areas that were river or sea beds in ancient times." The Marbles are found in the Utah and Arizona areas. It is conceivable that there are also clusters of these in Corguinho, Brazil. The presence of red iron-rich sandstone rocks in the area suggest similar geological environs to the southwest. Moqui Marbles are readily available and sold world-wide. They are a favorite of rock collectors and people who endorse the New Age philosophies. The latter believe them to have healing properties, and use them to contact animal spirits, totems and guides, and to aid in shape-shifting. Some claim they can also be used for contacting ET's, for visioning and for journeying.[7,8]

Procedure:

Bedding and stone samples which were submitted for analysis are described below. All sampling was done by Linda M. Howe on Feb. 9, 2003 at the home of Urandir Oliveira, Corguinho, Brazil.

Bedding Samples:

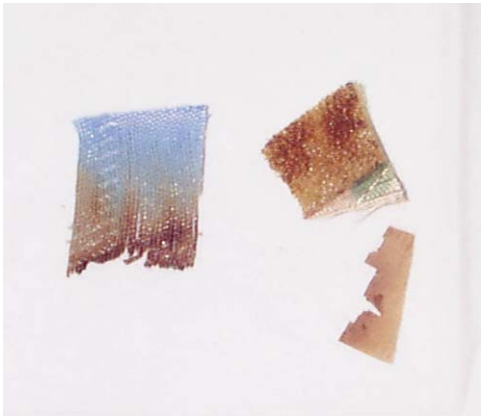
Following is a photograph of the bed and imaged sheet and pillow from which the bedding samples were obtained. The body image on the sheet visually appears to consist of burned areas and darker blue, halo-like areas. In this report they will be referred to as ***"burned"*** and ***"halo"*** to distinguish the differences between the two image regions. (NOTE: The sheet appears blue, but close inspection

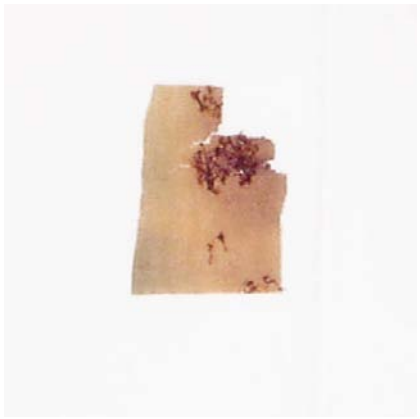
[6] www.lotzorox.com/moqui.html
[7] www.geocities.com/vampyress1138/crystalmagick.htm
[8] This does not necessarily represent the viewpoint of this analyst.

shows it is actually blue fibers cross woven with white fibers. See the photographs of the control samples from the sheet below.[9])

Linda Moulton Howe Photograph

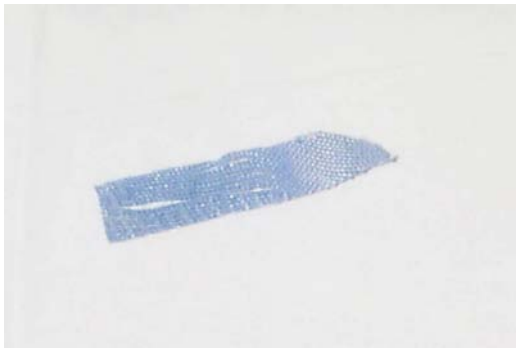
Sample 1. This sample is comprised of both sheet and mattress pad swaths. It was obtained from the right leg "body print" area on the bed. In the following photograph the sheet sample (25 x 30 mm) is on the left, and the mattress pad remnants are on the right. The second photograph is of another mattress fragment with debris. They all are primarily from a burned area, though some halo area is included.



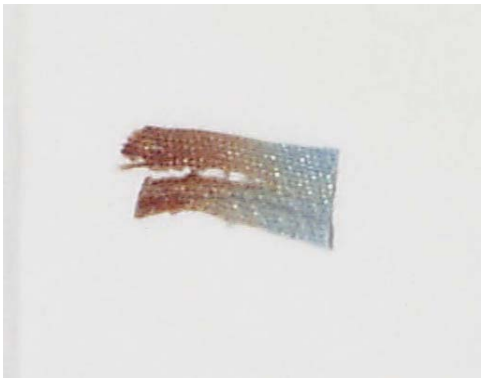


[9] All photographs in this report were acquired by Frontier Analysis, Ltd. unless otherwise indicated.

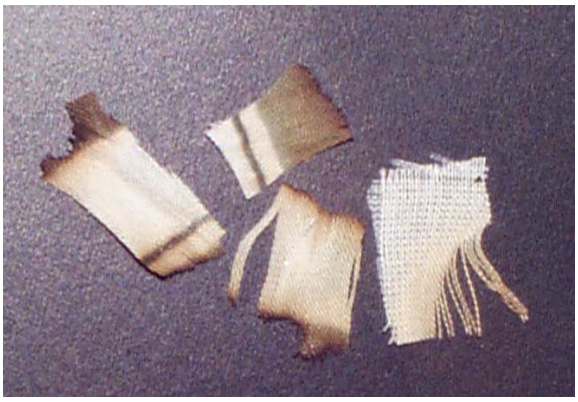
Sample 2 is an image sheet swath (10 x 54 mm) from the left leg at the same level opposite the scorched right leg sample location (sample 1). This swath is from a halo area.



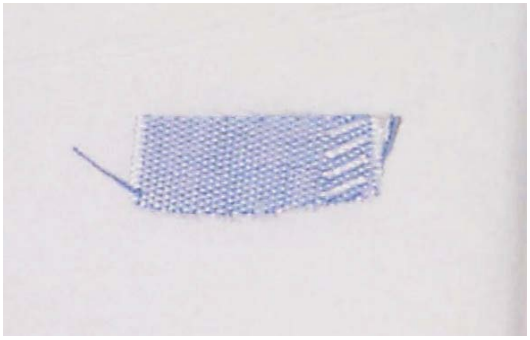
Sample 3. This is a sheet swath (10 x 25mm) is from the lower back image area and is from a burn area. A smaller amount of halo area is apparent.



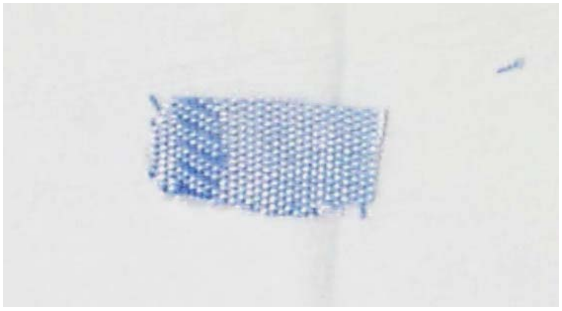
Sample 6. This sample consists of four pieces of pillow material from the head image area. The left swath is (13 x 30 mm). Burn areas are apparent.



Control 1. This a control swath (13 x 30 mm) from the north corner of the bed sheet for comparison to the above samples from the image areas.



Control 2. Another control swath (12 x 26 mm) from the west corner of the bed sheet was also submitted for comparison to the swaths from the image areas.



Control 3. An additional control swath from the south corner of the sheet. No photograph was obtained form this sample. It was sent for SEM/EDS analysis to Avalon Foundation for reference purposes.

Frontier analysis acquired numerous Infrared spectra from the above samples “as received”. These include spectra of: the individual blue and the white fibers from the control sheet; many of the “body image” areas of the sheet; the mattress pad and its cover; the “image area” of the pillow. The spectra were obtained using the Harrick SplitPea® accessory on the Nicolet Avatar 360 spectrometer. Also extractions were done on combined image sheet samples 1, 2, and 3 and combined sheet controls 1 and 2. They were first extracted using spectrograde hexane, a non-polar solvent; followed by distilled water, a polar solvent. The solvent was allowed to evaporate at ambient temperature in the laboratory. Infrared spectra were obtained from the extracts. Stereomicroscope photographs were obtained using the Leika GZ6 microscope interfaced to a Kodak Digital Science MDS 120 camera. Avalon foundation’s Nick Reiter provided both SEM images and EDS data of a bedding swath burn area from sample 1.

An experiment was performed to duplicate the melting properties of halo image areas of the sheet. Swaths of polyethylene terephthalate (PET)[10] were obtained from a discarded piece of clothing. They were placed between pieces of aluminum foil and pressed at the highest setting of an iron for 2, 4, 6, 8 and 10 seconds. In the same manner cotton swaths[11] were also exposed to heat, but at 10, 45, 60, 120, 180 and 300 seconds. These were visually examined for melting and degradation. Regular photographs were obtained as well as stereomicroscope photographs. These tests determined approximate times to heat expose pieces of the control sheet. As a result, these were exposed to heat for 3, 4 and 10 seconds.

Stone Samples

Two round stones were submitted. They both have the same diameters of 16 mm. Stone #1 weighs 3.2051g, and stone #2 weights 3.3068 g. Photographs of the stones follow.

Stone #1 **Stone #2**

Stone #2 was broken in half. Frontier Analysis acquired infrared spectra of both the interior and the exterior of Stone #2. Stereomicroscope pictures were also acquired. Avalon Foundation provided EDS data. The sampling for the SEM data acquisition was about 2 mm below the outer surface. The instrument used was an EDS (TN 5400 with light element detector). The sample was also checked with a Baird Atomic Geiger counter.

A Corguinho, Brazil red iron-rich sandstone rock which is typical of the area was submitted for reference. Infrared and EDS data were obtained.

Additionally, a Moqui Marble reference was contributed by Avalon Foundation along with EDS reference data. An infrared spectrum was obtained by Frontier Analysis, Ltd.

[10] The compositions of the clothing were verified by infrared spectroscopy before the experiment began.
[11] See reference 10

Results:

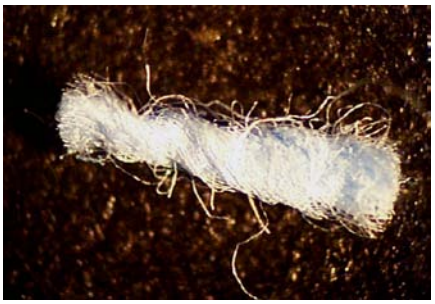
The results of the individual tests performed on the samples follow. These results are summarized in the conclusions section on page two of this report.

Bedding Samples

a.) Sheet Samples

Stereomicroscope photographs of the individual blue and white filaments from the control sheet clearly show they have a different appearance. Each fiber filament is actually a bundle of individual strands. The blue fiber strands are not as aligned and ordered as the white strands.

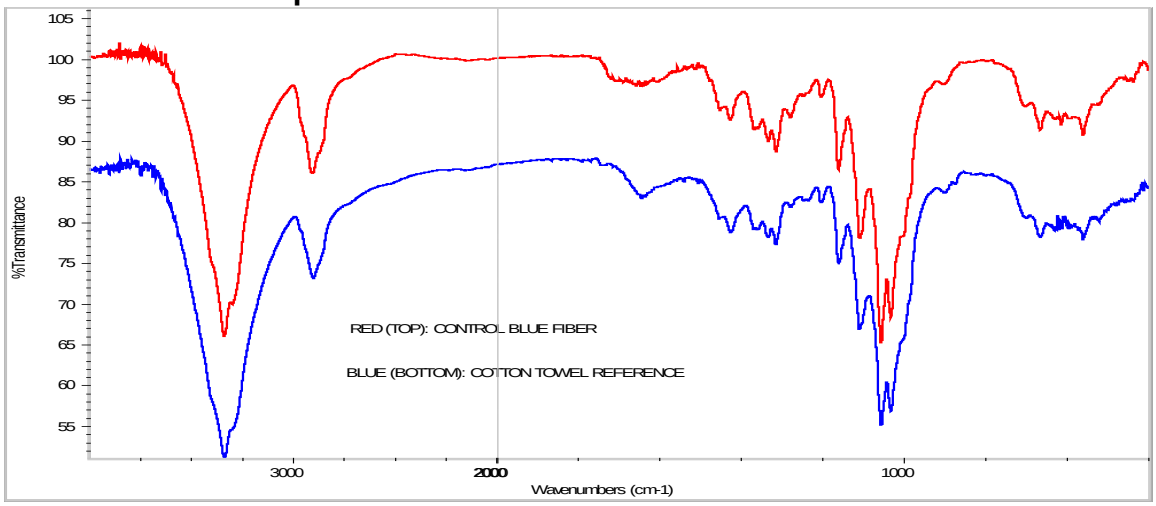
Blue Filament



White Filament

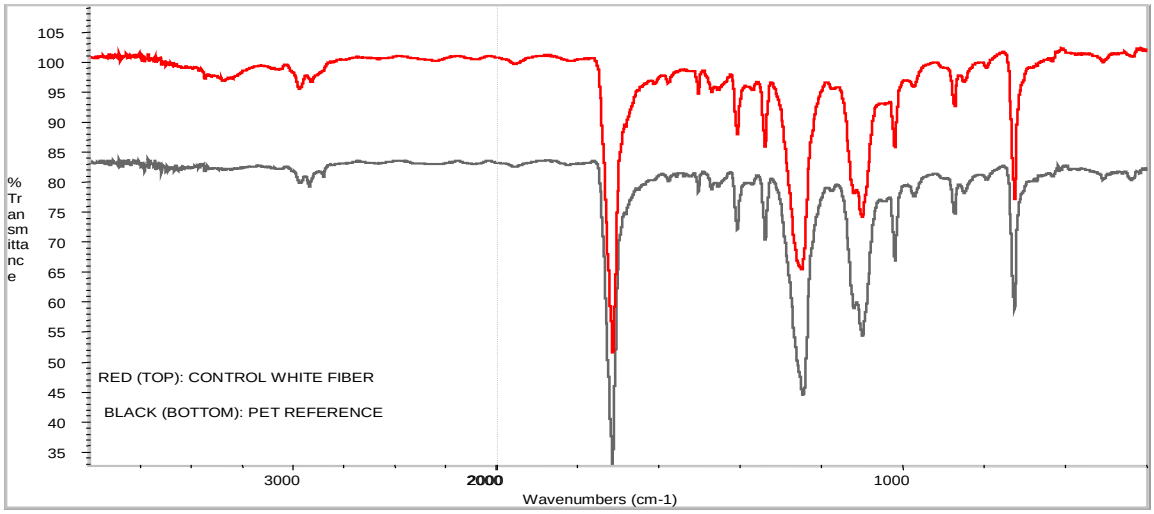
Infrared analysis shows identifies the blue filament as cotton, a natural fiber, and the white filament is poly(ethylene terephthalate), i.e. (PET), a synthetic fiber. Spectra of the two fibers follow accompanied by references of cotton and PET for comparison.

Infrared Spectra of the Blue Fiber and Cotton Reference[12]



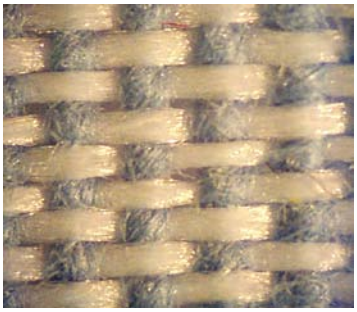
[12]Infrared Cotton Reference; Frontier Analysis, LTD Miscellaneous References Library.

Infrared Spectra of White Fiber and Poly(ethylene Terephthalate) (PET) Reference[13]



Following are selected microphotographs of control 1 and the affected areas of the sheet swaths. Keep in mind that the blue fibers are cotton and the white cross fibers are PET when comparing the control to the "exposed" swathes. A control swath is shown first to demonstrate the sheet fabric's normal appearance.

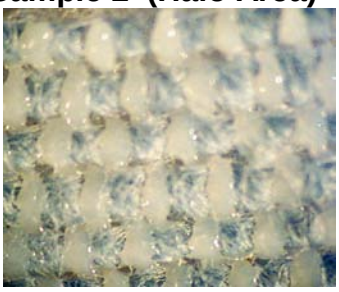
Control 2



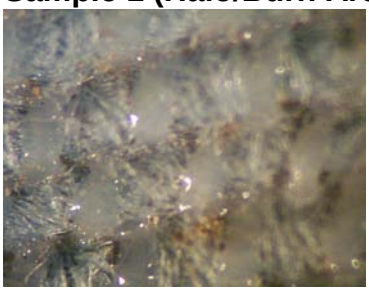
Next are the microphotographs of a variety of selected swaths from the body image sheet areas. Note, in all of these pictures the white PET has melted. In the first photograph (halo area) the blue cotton is intact. There is slight cotton degradation in the second (halo/burn area). In the last two photographs (burn areas), the cotton is now brown indicating degradation, and the PET has suffered a greater degree of melting. In fact, the PET appears to have experienced flow. This indicates the samples from the halo areas have been exposed to either a lower temperature and/or less contact time with heat compared to the burned area.

[13] See reference 12.

Sample 2 (Halo Area)



Sample 1 (Halo/Burn Area)



Sample 3 (Burn Area)

Sample 1 (Burn Area)

It is noted that cotton degrades at 148°C (298 °F) and PET has a melting range between 250-265°C (482-509 °F)[14] [15]. So the question may be asked: "Why doesn't the cotton show signs of degradation in the first image?" This effect has to do with the time rate differences for "melting" PET and "degrading" cotton. The thermal conductivity values[16] for these two different materials in the table below shows that the melting reaction takes less time than the degradation reaction. In fact, the thermal conductivity is about two times faster for PET compared to cotton. A fast burst of heat (above the melting point of PET) on the order of a few seconds could produce the halo effect, i.e. just melt the PET but not degrade the cotton.

Thermal Conductivity Values[17]

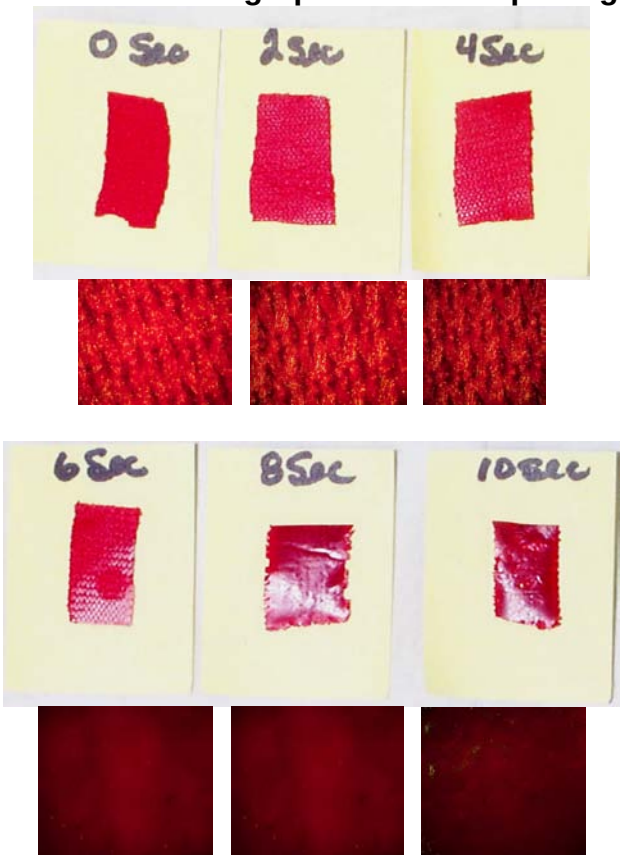
Textile	W/m*K
Cotton	0.071
PET	0.147

[14] E. H. Immergut et al Editors, "Polymer Handbook", Fourth Edition, John Wiley & Sons, Inc., 1999.
[15] "Hawley's Condensed Chemical Dictionary", Fourteenth Edition, Wiley-Interscience, New York, 2001.
[16] **Thermal conductivity** is the time rate of transfer of heat by conduction, through unit thickness, across unit area for unit difference of temperature. It is measured as calories per square centimeter for a thickness of one centimeter and a difference of temperature of 1°C. (Definition from: "The Handbook of Chemistry and Physics", 69th Edition, 1988-1989, CRC Press.)
[17] See reference 5.

To support the above argument, an experiment was performed by this laboratory to accomplish melting the PET polymer, but not degrading the cotton, on bits on the control swaths. The heat source was a hot iron at its highest setting. A thermocouple was placed between the soleplate and Teflon iron cover recorded a temperature range between 235-260C° degrees[18]. First, an estimate of approximate exposure time to the control needed to be established. This was done using swaths of pure PET and pure cotton from some discarded clothing.

PET knitted cloth was first exposed to a hot iron for 0, 2, 4, 6, 8, and 10 seconds. Below, are photographs of the swaths after each exposure accompanied by microphotographs. They clearly show rapid melting beginning as early as 2 seconds. Note the shiny appearance of the fibers begins at 4 seconds, and by 6 seconds the fibers are starting to melt into each other. By 8 seconds the PET is completely melted. At 10 seconds the melt appears to slightly darken which indicates the onset of degradation.

Reference PET Photographs and Microphotographs



[18] Temperatures on many steam iron specification sheets denote ranges between 80°C-200°C (176°F-392°F) for some irons (www.imagesupply.net/astro/Panasonic3359.htm) and 120°C-210°C (248°F-410°F) for others (www.Panasonic.ca/English/appliance/irons/nil45nr.asp).

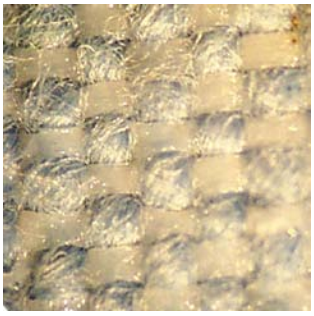
The same experiment was done on cotton swaths. It was found that much longer contact time was needed before the onset of degradation. The results of contact times of 10, 45, 60, 120, 180 and 300 seconds are shown in the photographs and accompanying microphotographs below. It is noted that very slight degradation (yellowing) may occur around 60 seconds. It then darkens progressively to a brown color at 300 seconds.

Reference Cotton Photographs and Microphotographs

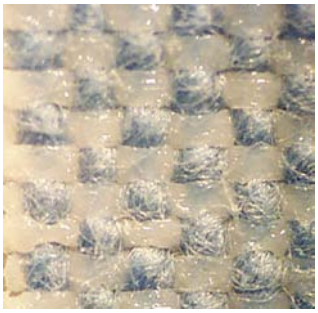
From the above two experiments it was decided to use iron contact times of 3, 4 and 10 seconds on bits of the control PET/cotton sheet from the event. The microphotographs recording the results of these tests follow. Clearly they show cotton is not degraded, and the PET melted for all contact times.

Control Sheet Swaths Exposed to Heat

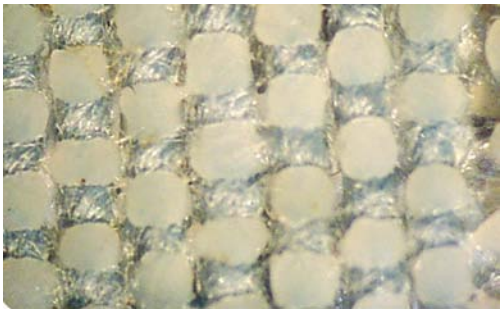
3 Seconds



4 Seconds



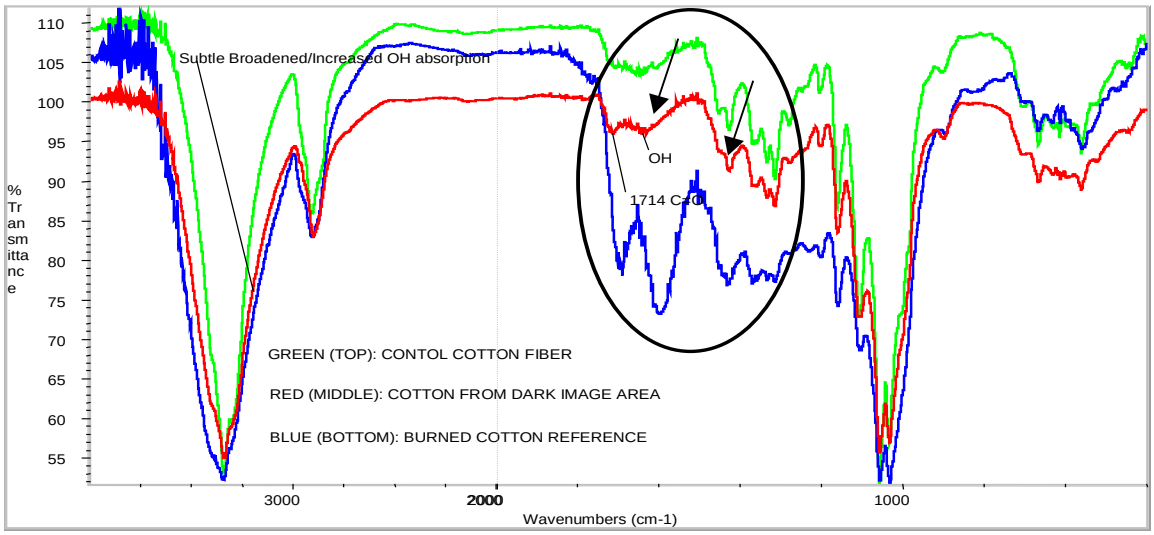
10 Seconds



Numerous infrared spectra were acquired from the surfaces of the "as received" burned areas of the image swaths to determine any unusual effects to the fibers or evidence for other components. No additional materials were detected. However, a spectrum of a cotton fiber from the dark brown swath area (Sample 1) shows slight signs of oxidation suggestive of high heat exposure. This is suggested by a subtle increase in OH (3500-3100 cm^{-1}) and possible C=O absorption[19] (1714 cm^{-1}). It shows similar spectral changes to a reference of cotton that had been slightly burned. The region between1800-1300 cm^{-1} especially shows these similarities. Following are the spectra of a cotton fiber from Control 1, a Sample 1 burn area, and a burned cotton reference which displays these observations.

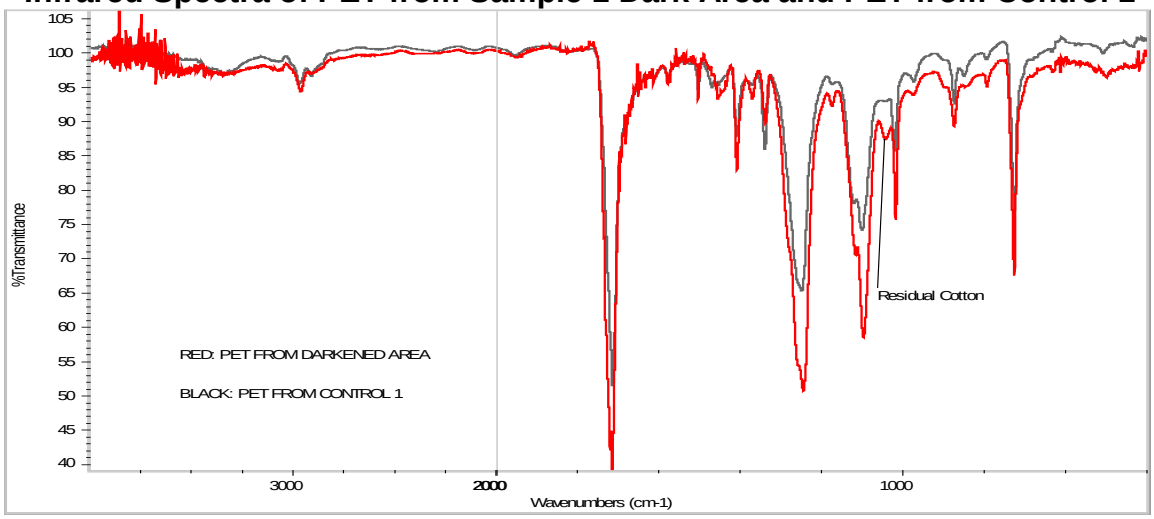
[19] Though care was taken to isolate cotton from PET in the dark "image" areas, some residual PET may also account for the C=O absorption. PET in the dark areas tended to melt/flow into the cotton making separations difficult.

Infrared Spectra of Control 1 Cotton, Sample 1 Burn Area Cotton, and Burned Cotton Reference.



Infrared analysis of melted PET from the same region of the sheet shows no evidence of degradation. A small amount of residual cotton is noted in the following spectrum. The spectrum is compared to PET from the control 1 sheet sample.

Infrared Spectra of PET from Sample 1 Dark Area and PET from Control 1



Analysis to determine whether there were any unusual solvent soluble residues, not detected in the above “as received” surface spectra, was done on combined sheet samples 1, 2 and 3. The small aliquots of the samples excluded doing individual extractions. Additionally, combined controls samples 1 and 2 were extracted for comparison.

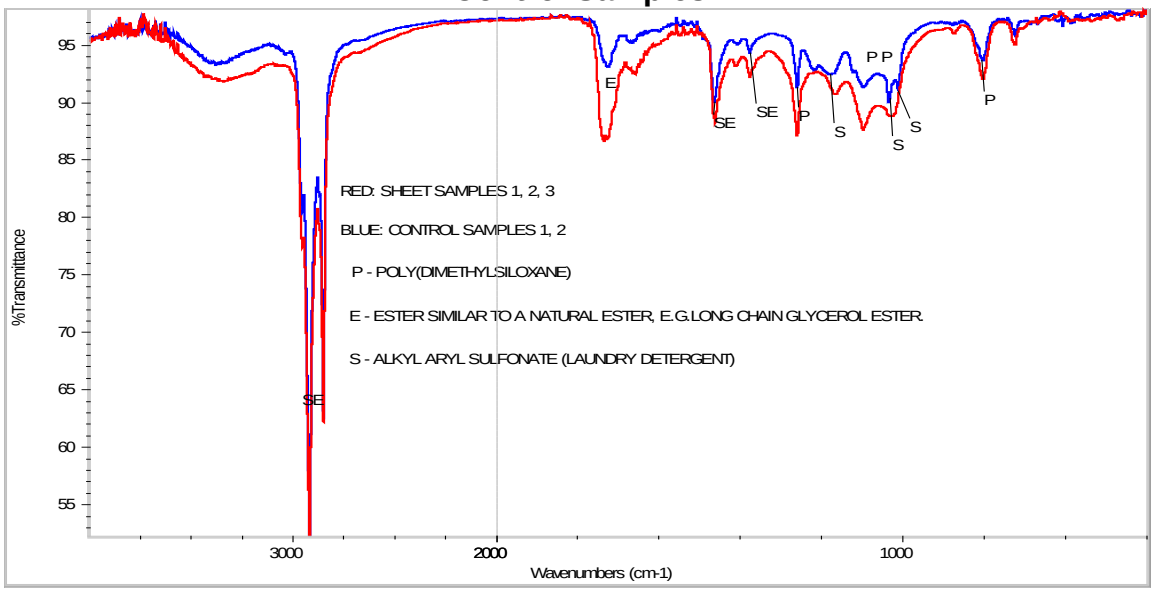
The samples were first extracted by a non-polar solvent, hexane. Surprisingly, more material was extracted from the control. The hexane extract amounts follow.

Hexane Extract Amounts

Sample	Hexane Extract mg/g
Sheet Image Samples 1, 2, 3	3
Sheet Controls 1, 2	12

Infrared analysis of the hexane extracts shows both extracts contain poly(dimethylsiloxane), which is probably used for sizing, and a natural ester. An additional component was found in the control sample and is an alkyl aryl sulfonate. This is undoubtedly residue from laundry detergent. It accounts for some of the excess amount of residue in the control. It is interesting that this material is not detected in the image swaths. This may indicate it has been decomposed by the heat. The spectra follow. Relevant infrared references can be found in the appendix.

Infrared Spectra of Hexane Extracts from the Image Samples and the Control Samples

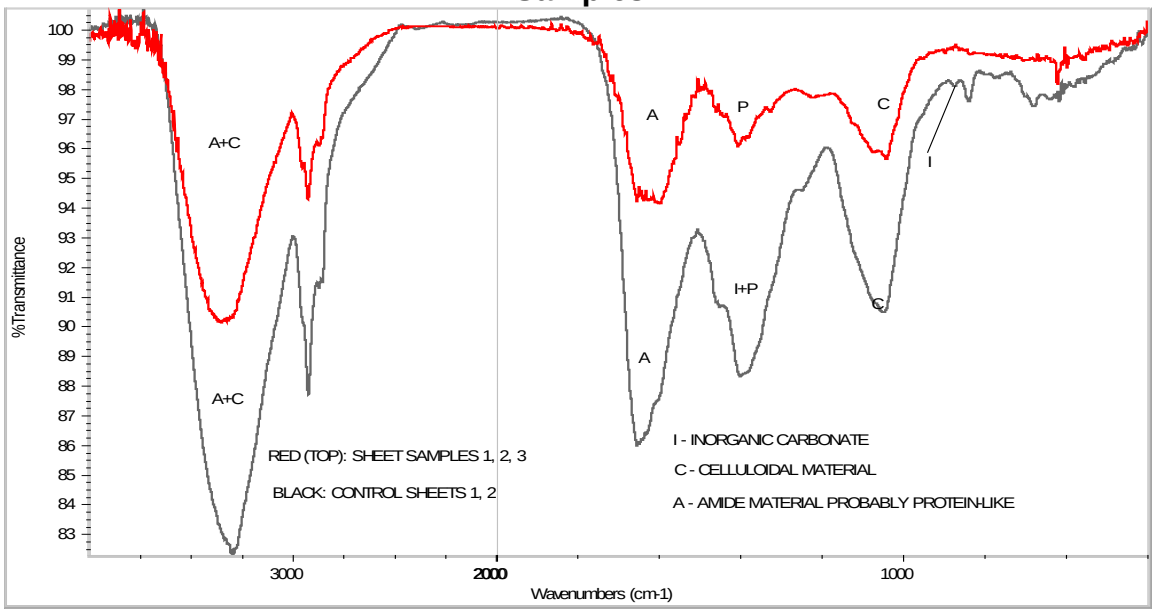


The polar solvent extraction, water, was done on the same swaths after the hexane extractions. Again there was slightly more material extracted from the control samples. The amounts follow.

Sample	Water Extract mg/g
Sheet Image Samples 1, 2, 3	6
Sheet Controls 1, 2	8

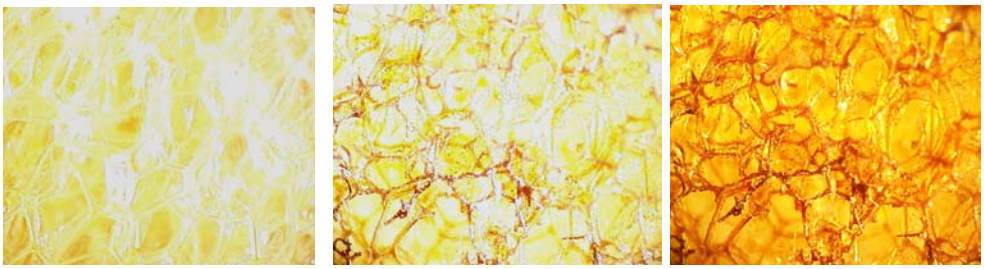
Infrared spectra of the extracts compare to each other, indicating a similar composition. For the most part, the spectra of the two extracts are comparable. They indicate both contain soluble celluloidal material and amide which could be some soluble protein. In addition, the control samples appear to contain a small amount of inorganic carbonate. The spectra follow.

Infrared Spectra of Water Extracts from the Image Samples and the Control Samples



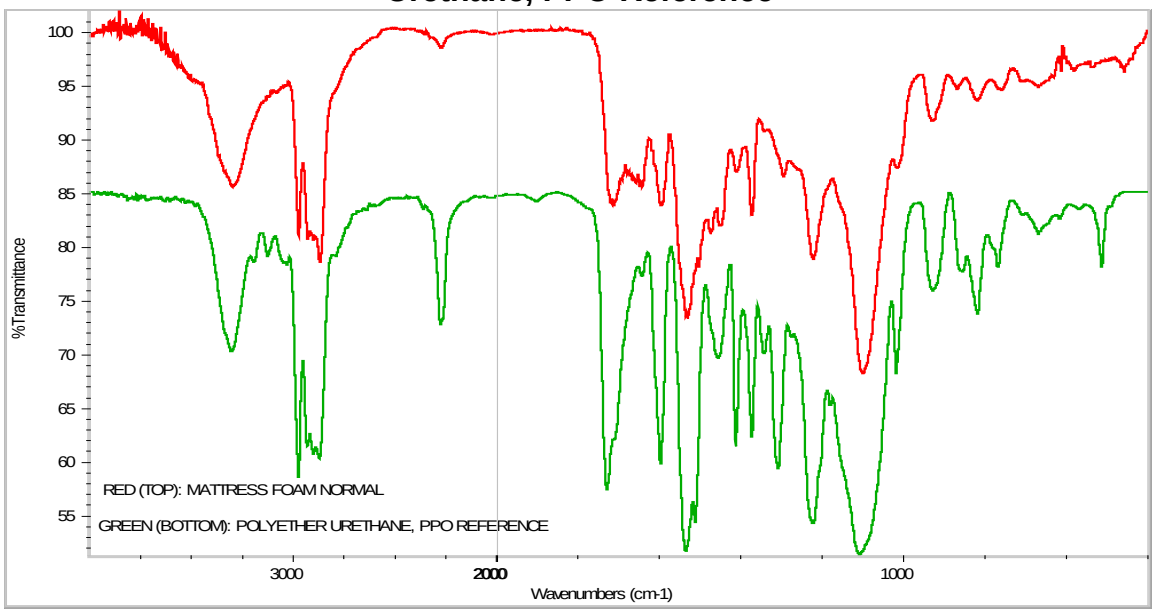
b.) Mattress Pad: Microphotographs of the foam portion of Sample 1 follow. The three photos from left to right show the foam's original yellow-beige appearance, then a slightly brown flecked appearance, and finally a dark brown. A melting/shriveling is apparent in the brownish foam in the middle and left photos suggestive of degradation caused by heat.

Normal Foam **Slightly Discolored Foam** **Discolored Foam**



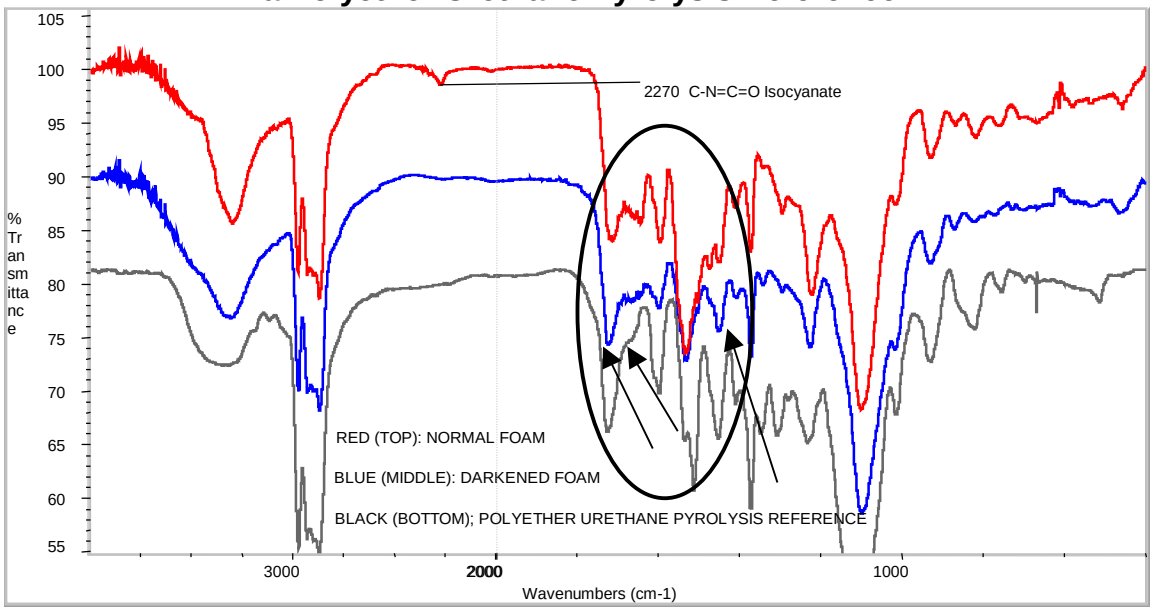
Infrared analysis of the foam of the mattress pad shows it is composed of polyether urethane. Specifically, the ether portion of the polymer is polypropylene oxide (PPO). Following is a spectrum of the foam and a polyether urethane, PPO for reference.

Infrared Spectra of Sample 1 Normal Mattress Foam and a Polyether Urethane, PPO Reference



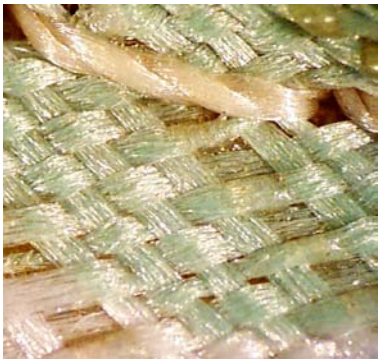
Spectra from the normal yellow-beige material compared to a browned material shows evidence of degradation by heat. Below the top spectrum shows the normal mattress spectrum compared to the middle spectrum of brown urethane. Clearly the 2270 cm^{-1} isocyanate group is now gone, and there is evidence of oxidation enhancement in the 1800-1400 cm^{-1} region. Additionally, the middle spectrum shows similarities in these regions to a reference spectrum (bottom) of a polyether urethane that had experienced pyrolysis.

Infrared Spectra of Sample 1 Normal Foam, Sample 1 Darkened Foam, and a Polyether Urethane Pyrolysis Reference



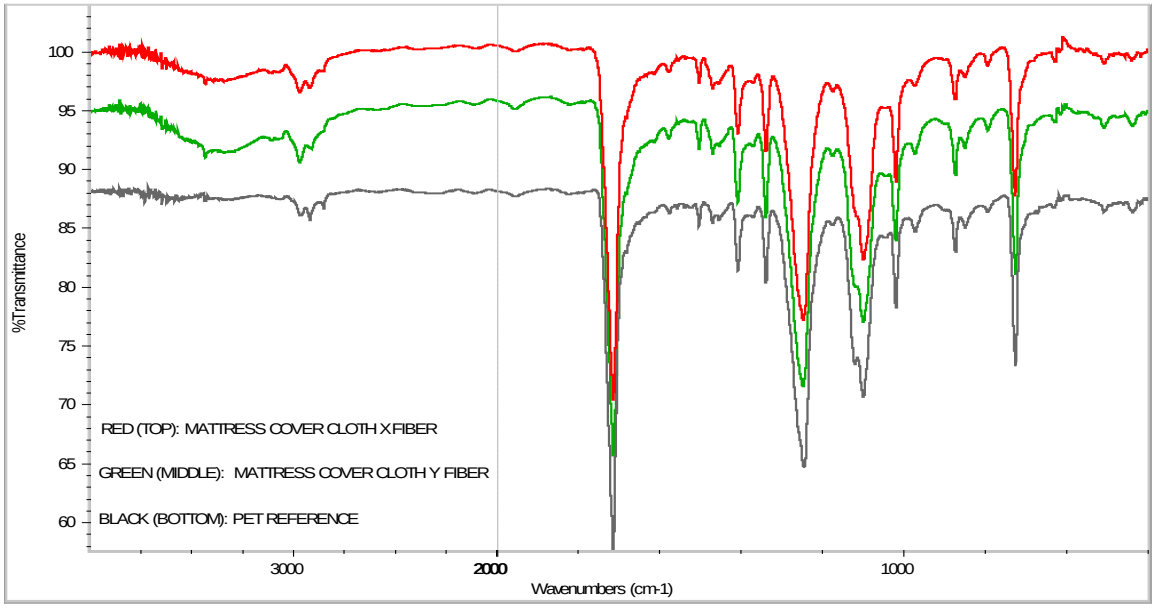
A microphotograph of the cloth stitched to the foam indicates the woven fibers in both the X and Y directions are all the same material. The fiber bundles are well ordered strands suggestive of the PET and similar to those observed in the sheet. (This was confirmed by the infrared analysis below.) The microphotograph follows. Note: the out of place fiber along the top is a stitch. The color is due to the dyed pattern of the cloth

Mattress Cover Cloth Stitched to the Foam



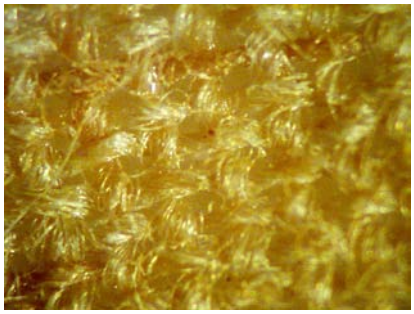
Infrared analysis of the fibers in both directions are identical and confirm they are PET. Following are the spectra along with a PET reference for comparison.

Infrared Spectra of Two Cross Fibers from Cloth Stitched to the Foam and a PET Reference

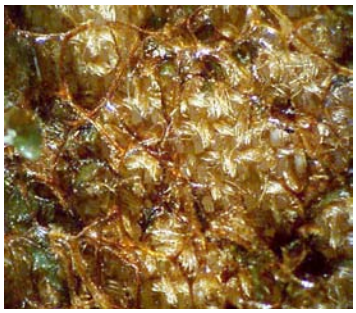


A stiff brown material included with the sample1 is part of the mattress pad cover. The sample examined (see right photograph of Sample 1 in the sample section) also has some debris attached to it. The first microphotograph which follows shows the cross woven fibers may have suffered shrinking. The cross weave fibers appear the same indicating the same composition. The second and third microphotographs show the debris consists of web-like material similar in appearance to the melted polyether urethane foam observed above. There are also greenish blobs of material.

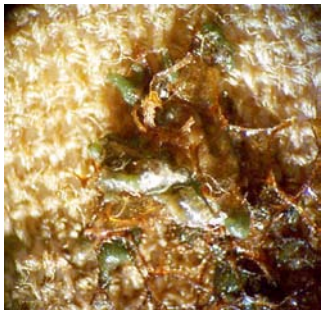
Brown Woven Material



Debris 1

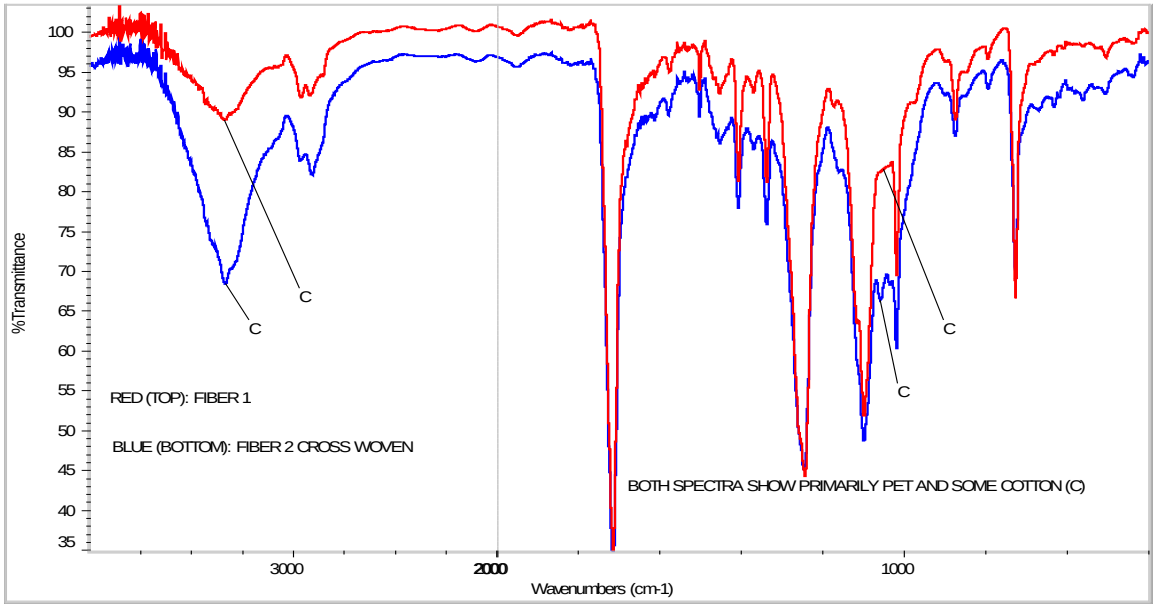


Debris 2



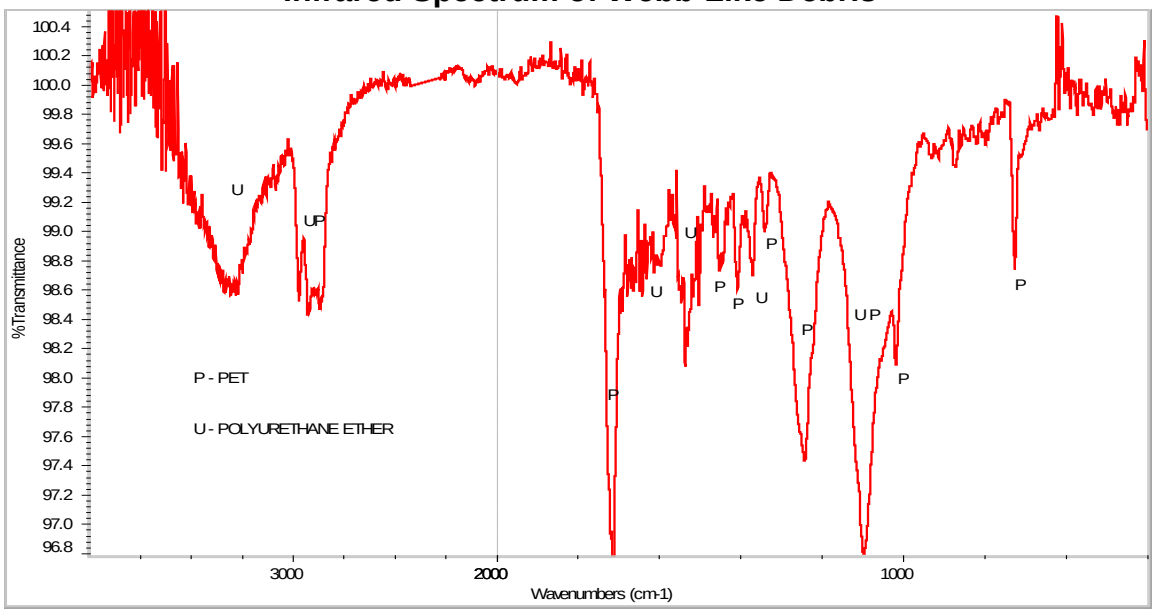
Infrared spectra of filaments from both directions of the cross weave show a predominance of PET, but a small amount of cotton is also present. This indicates the sample is composed of a PET/cotton blend, rather than individual materials. Following are the spectra.

Infrared spectra of Two Filaments From the Brown Mattress Pad Material Cross Woven to Each Other

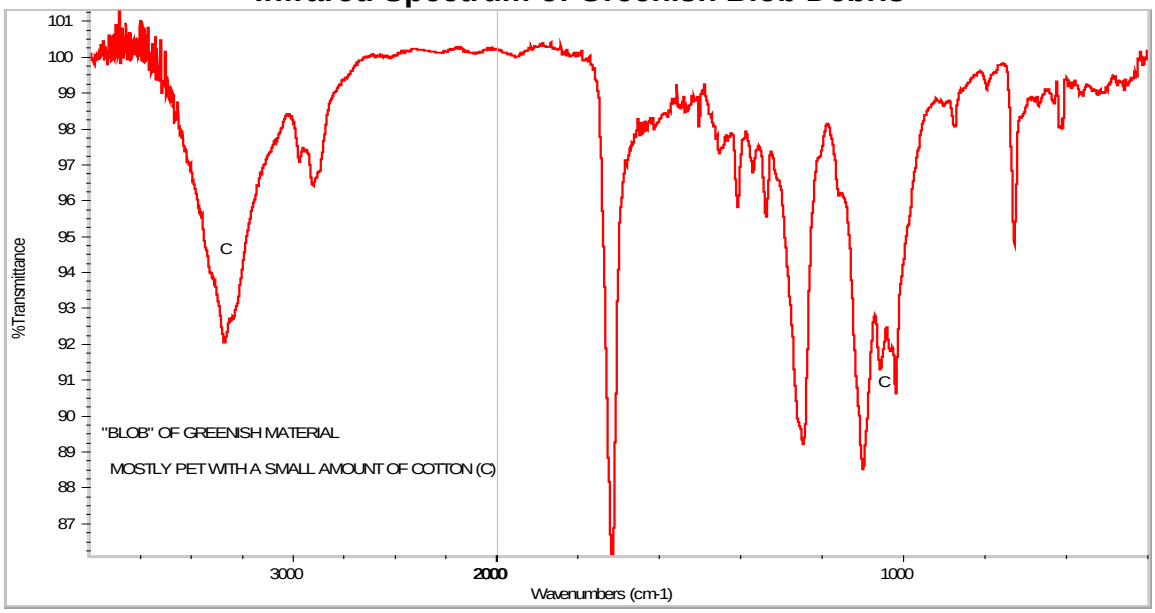


Spectra of the web-like material in the debris on this mattress material shows a mixture of polyether urethane and PET which have obviously melted into each other. The greenish blobs are primarily melted polyester with a small amount of cotton. Following are the spectra.

Infrared Spectrum of Webb-Like Debris



Infrared Spectrum of Greenish Blob Debris



c.) Pillow: Selected microphotographs of normal filaments and two image areas from the pillow (sample 6) are shown below. The first, a white area, is normal. Filaments with well-ordered bundles of strands are cross woven with filaments less ordered bundles of strands. These, like the sheet controls, are typical of PET and cotton, respectively. (See the infrared confirmation below.) The second photograph, from an image area shows melted beads of PET and intact cotton. (Note: The colored area is dye from the design.) Finally, the third picture shows the PET has melted and flowed into the cotton which is now brown and degraded. The last two photographs the swaths from the samples from these areas were exposed to different temperatures and/or less contact time with heat.

Normal Filaments

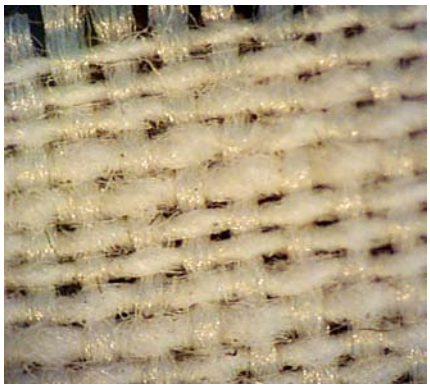


Image Area
Melted PET/Intact Cotton

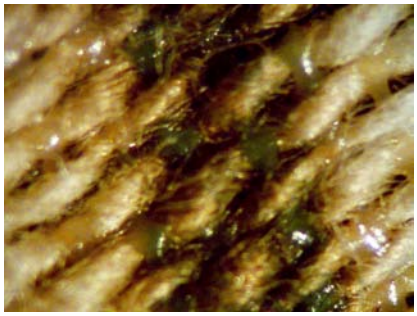
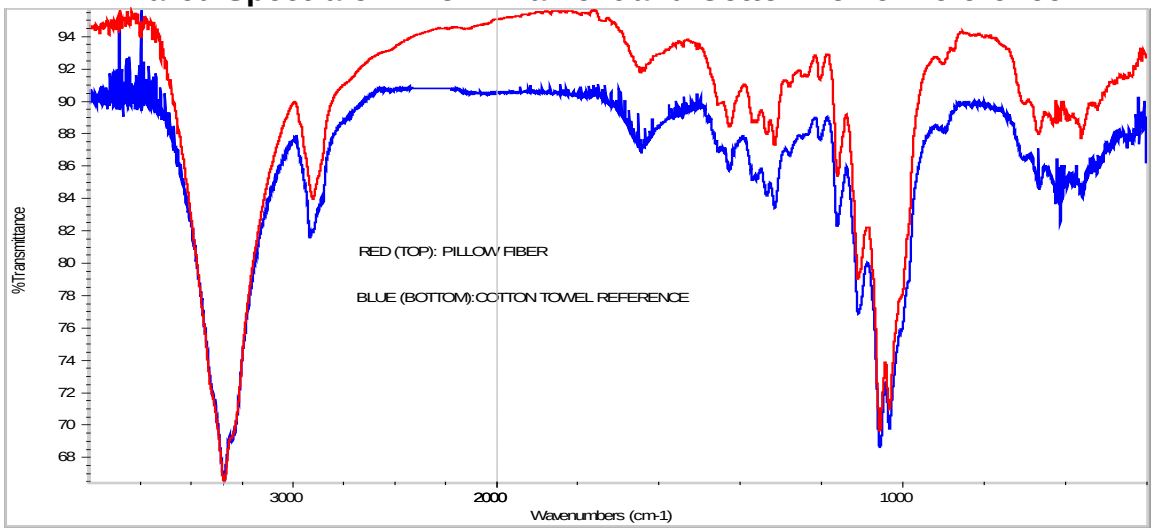


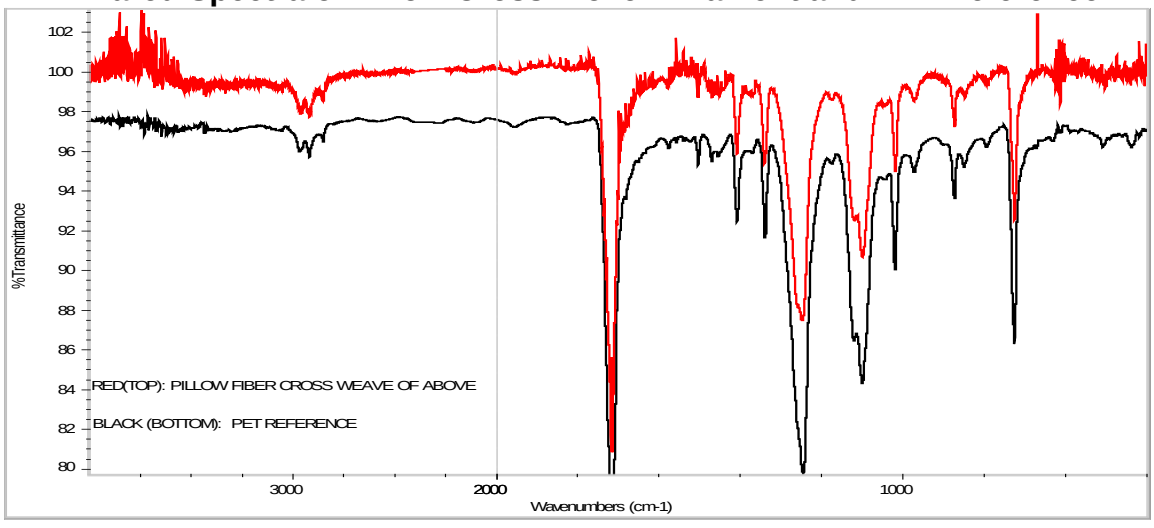
Image Area
Melted PET/Burned Cotton

Infrared analysis confirms the pillow fragments are composed of cotton cross woven with PET like the sheet. These spectra follow.

Infrared Spectra of Pillow Filament and Cotton Towel Reference

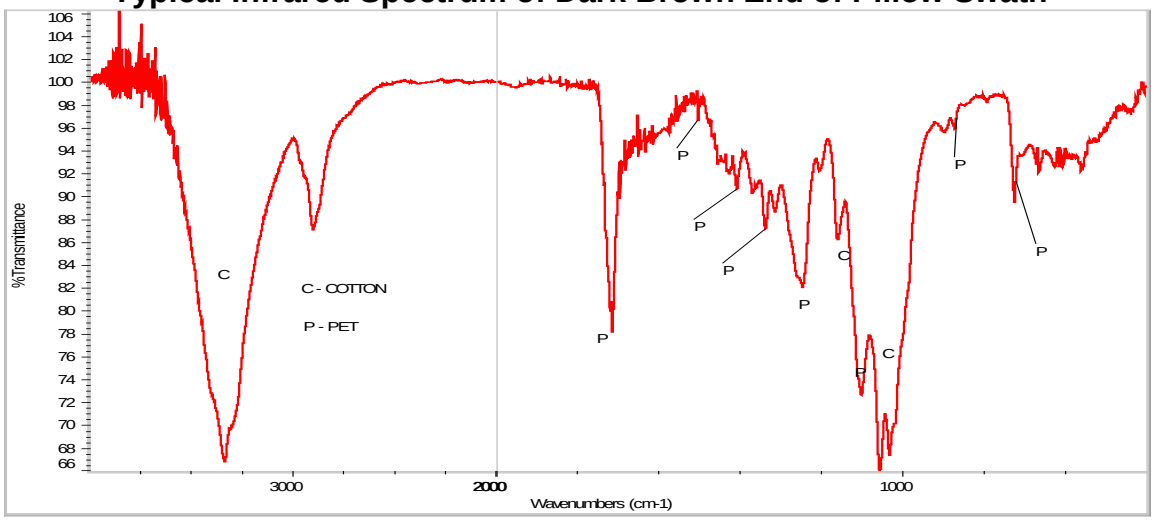


Infrared Spectra of Pillow Cross Woven Filament and PET Reference



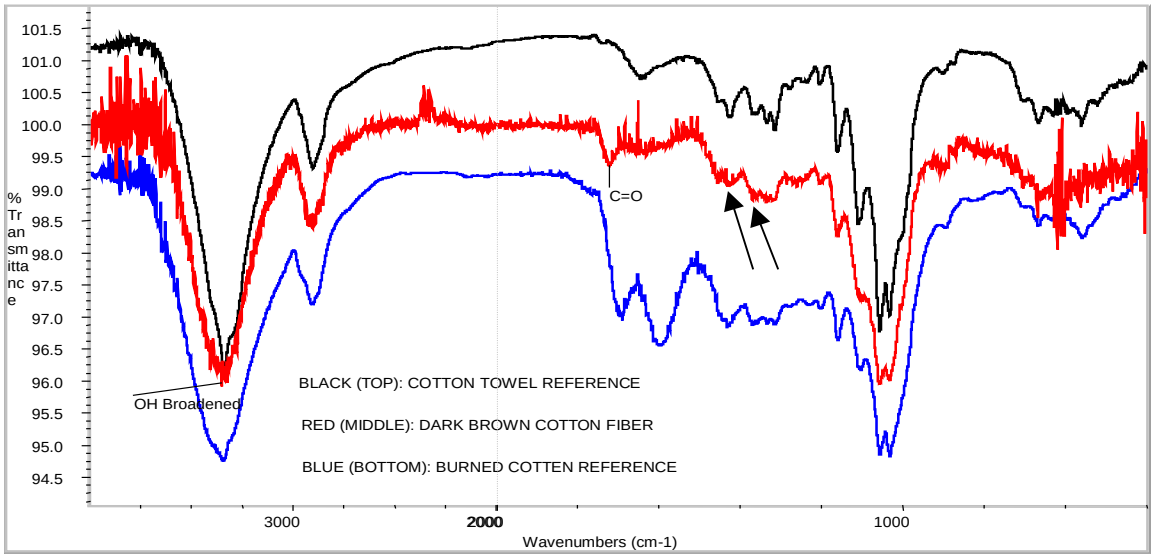
Most of the infrared spectra samplings of the darkened end of the swath show both cotton and PET components. It was difficult to obtain spectra of the individual materials because the PET was melted and dispersed into the cotton. No significant degradation of the melted PET was observed. The following selected spectrum is typical of most of the spectra showing the PET and cotton.

Typical Infrared Spectrum of Dark Brown End of Pillow Swath



In one instance cotton was tediously isolated from the dark brown image material. The spectrum indicates degradation which is suggestive of heat exposure. This is displayed in the following spectrum along with a spectrum of slightly burned cotton for reference. (The noisiness of the spectrum is due to the very small amount of cotton that was scanned.)

Infrared Spectra of Isolated Cotton from the Dark Brown End of the Pillow Swath and a Burned Cotton Reference



Stone Samples

The appearance of the stone samples compare to those known as Moqui Marbles. Following are the photographs of the stones, as well as Moqui Marbles for comparison.

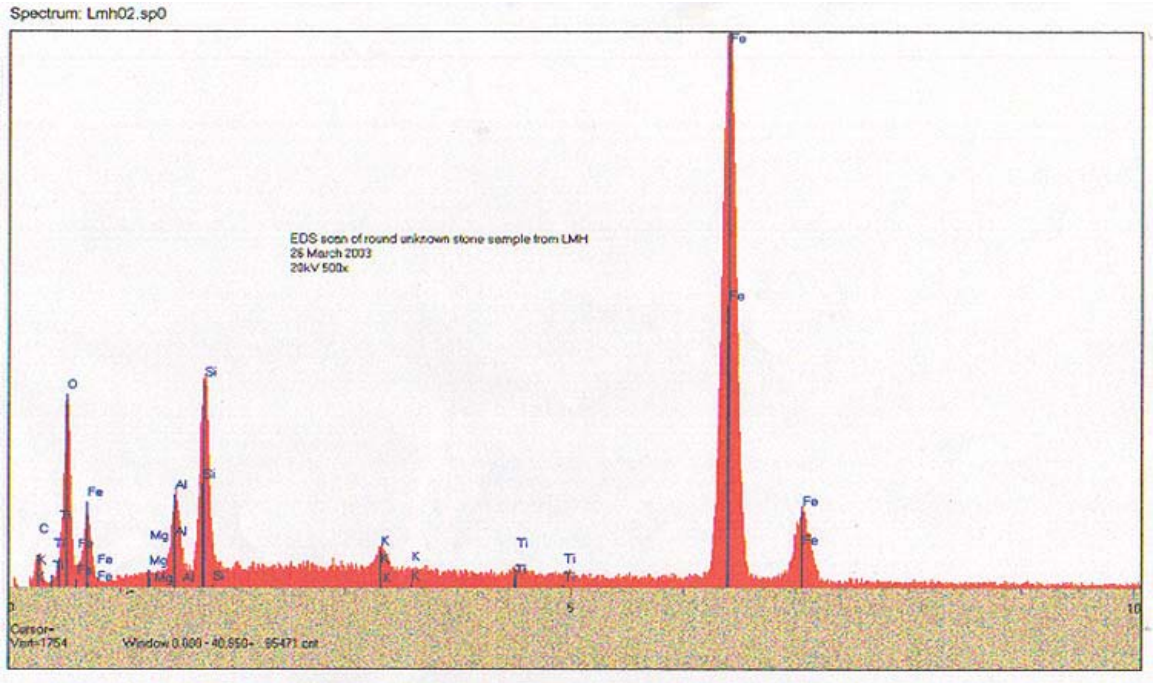
Stone 1 **Stone 2**

Moqui Marbles[20]

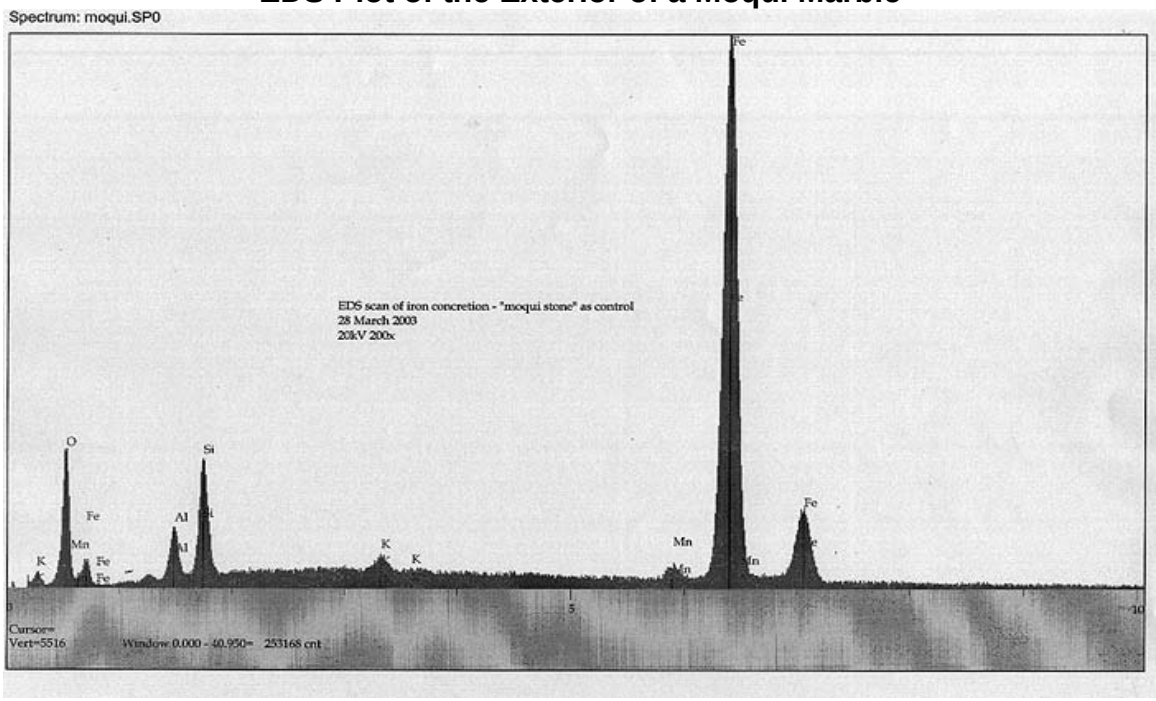
EDS data from the #2 stone support this identification. The detailed report by Avalon Foundation and other comments can be found in the Appendix. Avalon found that elemental composition (2 mm from the stone surface) is almost identical to that from the exterior of a reference of Moqui Marble. The data show the #2 Stone contains major amounts of Fe, Si, O, and Al, with very minor amounts of K, Ti, Mg and C. A Moqui Marble reference contains the same major elements, except there is a small amount of Mn instead of Ti and C. This minor variation is "likely, and would vary with the local mineralogy of the area and trace minerals in the water when the stones were formed." The EDS plots follow.

[20]Photographs of Moqui Marbles from left to right were found in the following websites: www.lotzorox.com/moqui.html; www.rocksandminerals.com/specimens/moqui.htm; www.utahphotowild.com/small/pages/small4.htm.

EDS Plot of Stone #2

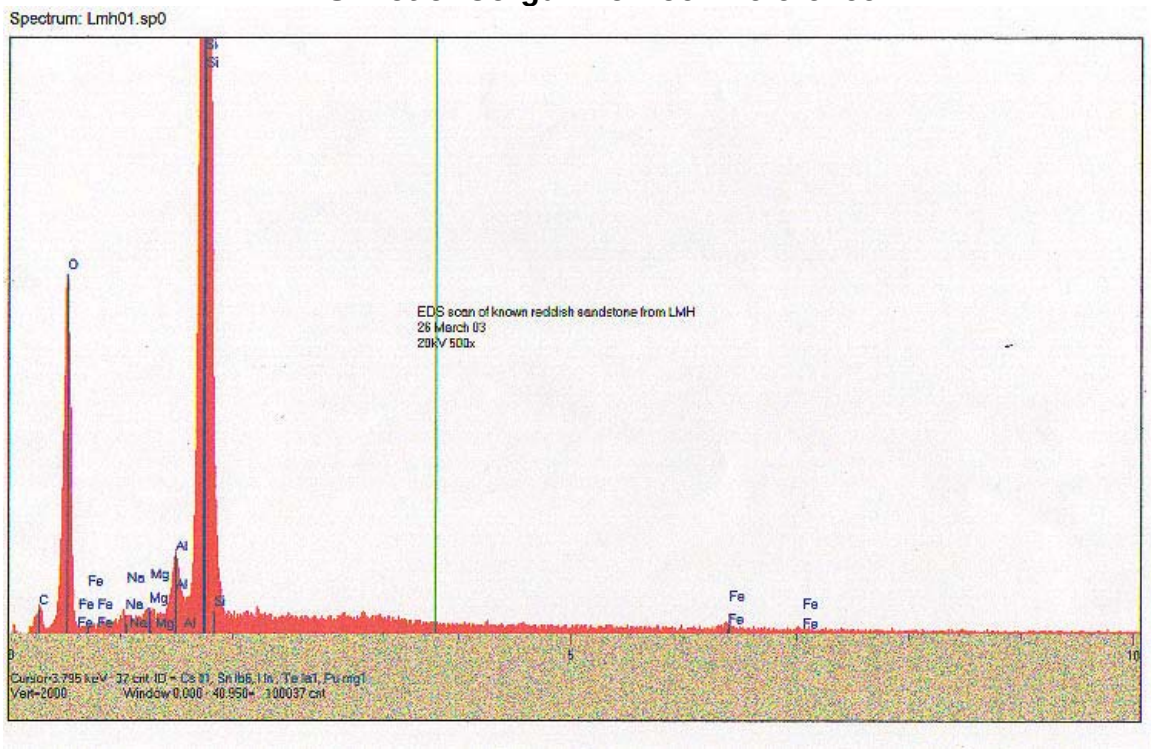


EDS Plot of the Exterior of a Moqui Marble

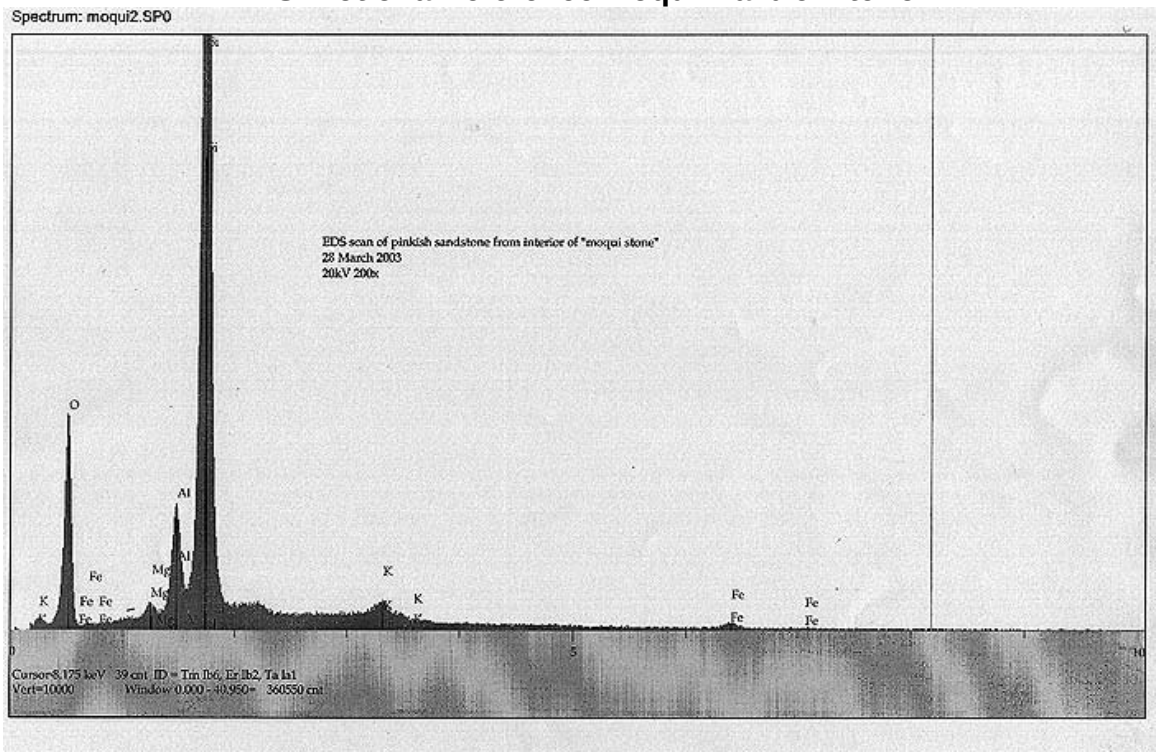


The data from the Brazil red iron-rich rock are similar to the sandstone interior from of a Moqui Marble. Both contain the same Si and O major elements, Al minor element, and small amounts of Fe and Mg. The only differences are small, i.e. the rock additionally contains Na and C. The Moqui uniquely contains K. Following are the plots of rock and Moqui interior.

EDS Plot of Corguinho Rock Reference

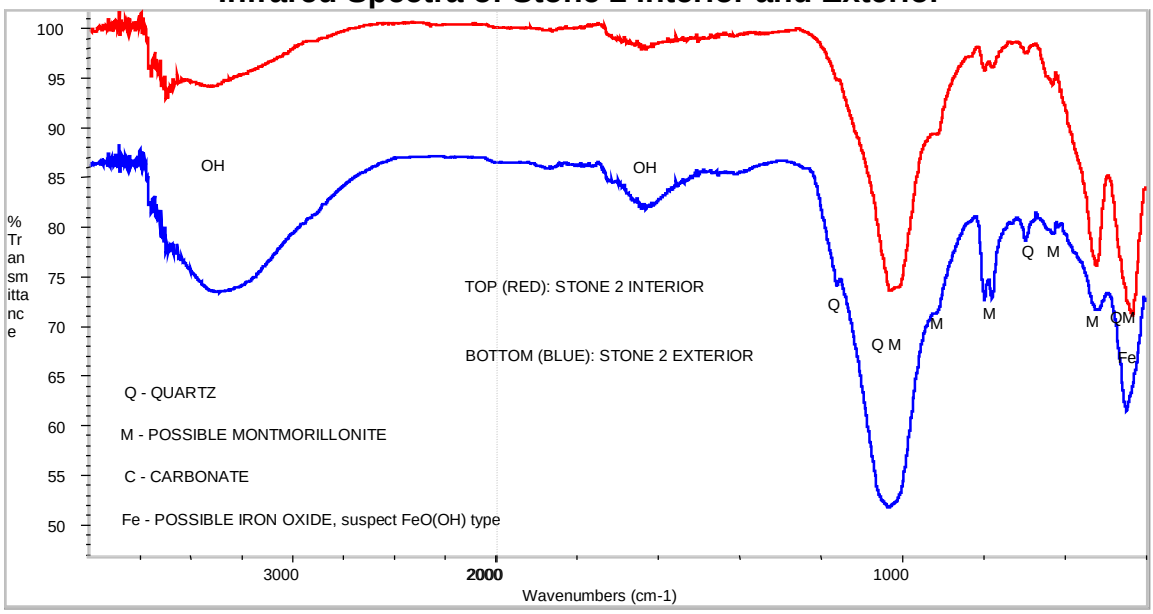


EDS Plot of a Reference Moqui Marble Interior

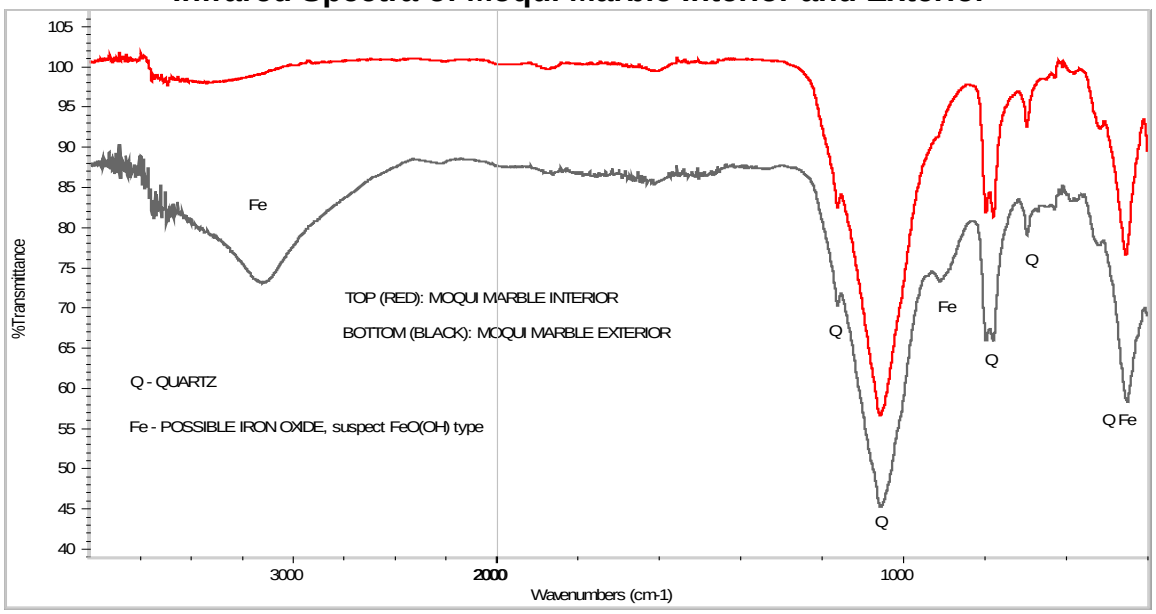


Infrared analysis shows stone 2 is an agglomerate of minerals which have a sedimentary origin. Specifically identified is a major amount of quartz, SiO_2, which is commonly present in sand and sandstone. Another major mineral is present which has spectral band similarities to montmorillonite, $(Na,Ca)_{0.33}(Al,Mg)_2Si_4O_{10}(OH)_2$. This mineral occurs in clay deposits, soils and sedimentary and metamorphic rocks. Iron in the form of iron oxide is probably present. However, its oxide form is not confirmed by infrared because the bands from the minerals mask pertinent Fe-O absorption. A very small amount of inorganic carbonate is also suggested which is probably in the form of calcite. Qualitatively both exterior and interior of the stone contain the same components, however quantitatively band ratios suggest there is more quartz, and probably iron oxide on the exterior of the stone. This layer effect is typical of Moqui Marbles. There are also spectral similarities to a reference of a Moqui marble which infrared shows contains quartz, a limonite variation of iron oxide, FeO(OH), which is a weathering product of iron-bearing minerals, and a very small amount of carbonate. The major difference noted between stone 2 and the Moqui is that the stone additionally contains a montmorillonite type mineral. This is probably because they both originate from different geological regions, though they are probably formed in the same manner. Spectra of the stone 2 interior and exterior, as well as the Moqui Marble interior and exterior follow. Some pertinent references are found in the appendix.

Infrared Spectra of Stone 2 Interior and Exterior

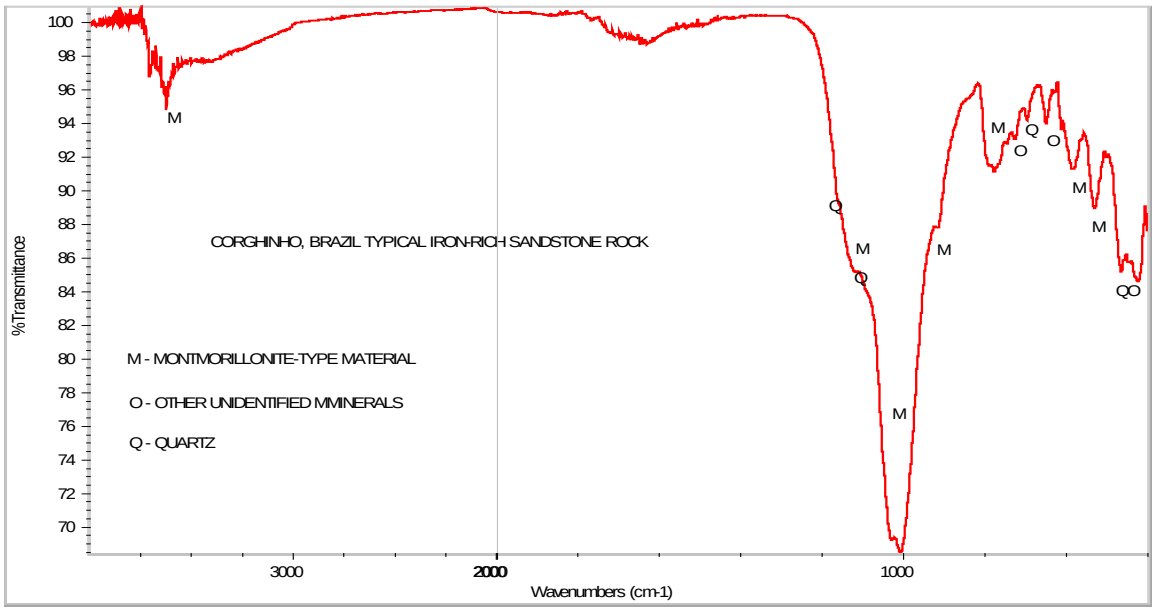


Infrared Spectra of Moqui Marble Interior and Exterior



The infrared spectrum of the Corguinho rock reference is typical of sandstone and therefore also indicates quartz, a montmorillonite-type mineral, and small amounts of other unidentified minerals. While similar it is not a complete match. The spectrum follows.

Infrared Spectrum of Iron-Rich Sandstone Rock common to the Corguinho, Brazil Area



An additional test for radioactivity on the stone by the Avalon Foundation showed no abnormal amounts were present.

Acknowledgments: I wish to thank and acknowledge the following colleagues/friends, who are polymer chemists, for their contributions to this effort: Dr. K. B., a performance fiber industry, Georgia; Dr. R. W., polymer industry, Ohio; Dr. L.B., Retired, Ohio; Dr. G.C., rubber recycling industry, Ohio; Bruce O. Budinger, Frontier Analysis, Ltd. consultant, Ohio.

_____
Phyllis A. Budinger

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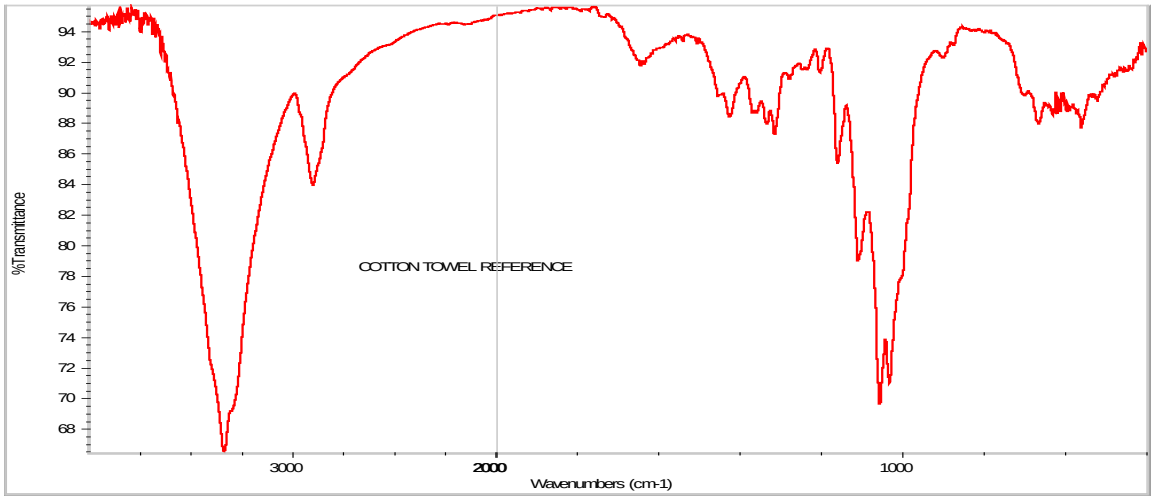
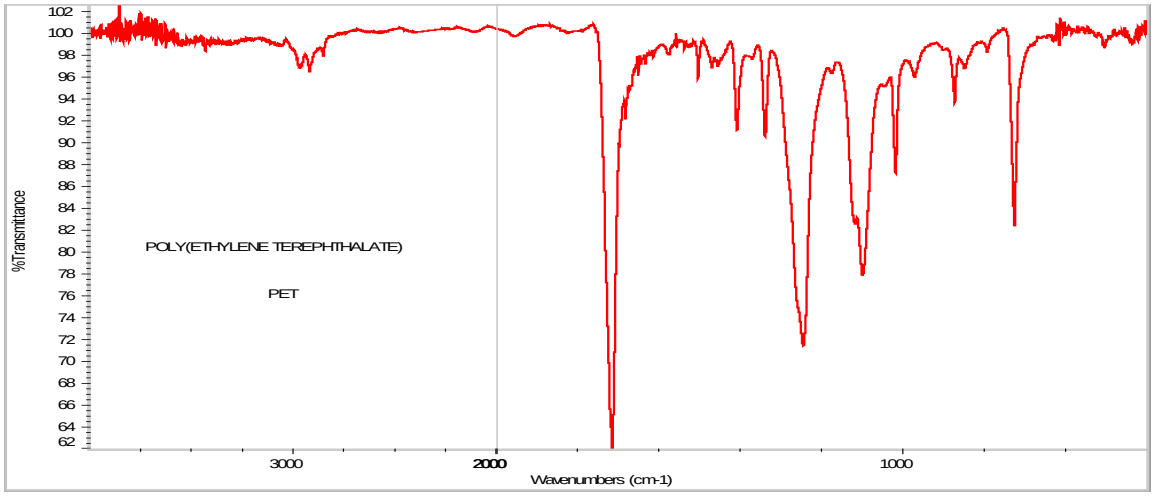
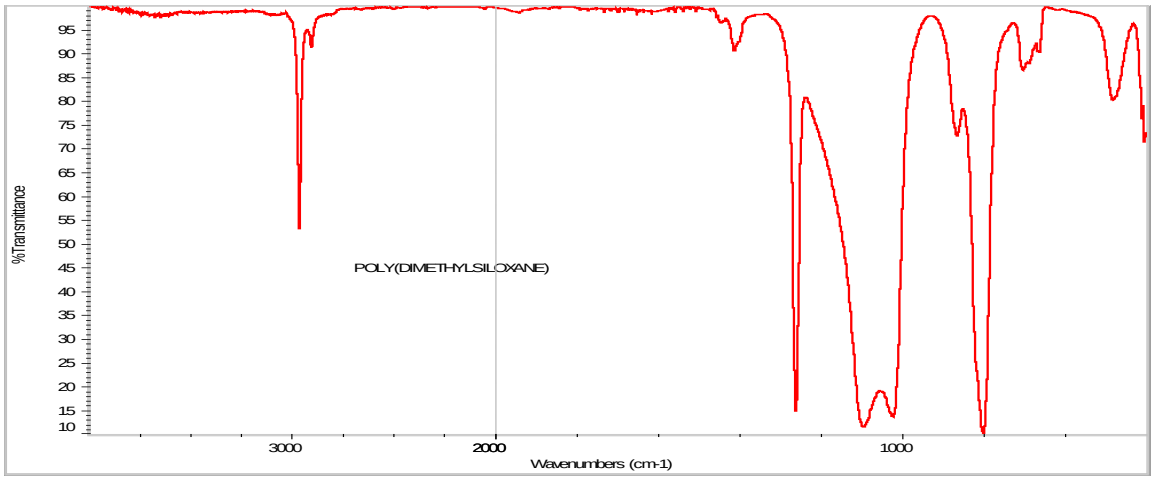
Dwight Connelly, MUFON Files
Mark Rodeghier, CUFOS Files
Nick Reiter, Avalon Foundation

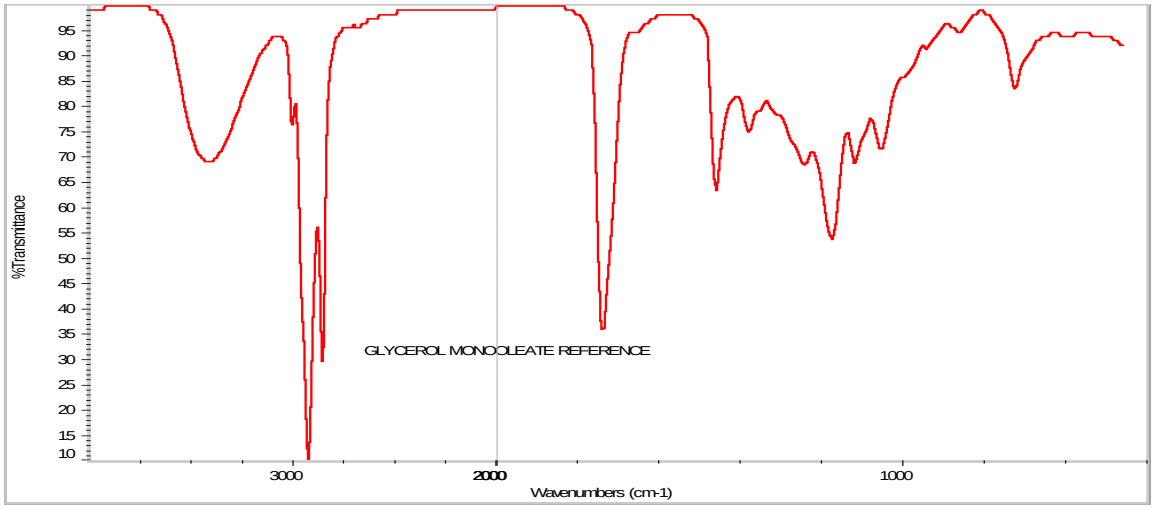
APPENDIX

Infrared Reference Spectra Relevant to the Corguinho, Brazil Event








%Transmittance
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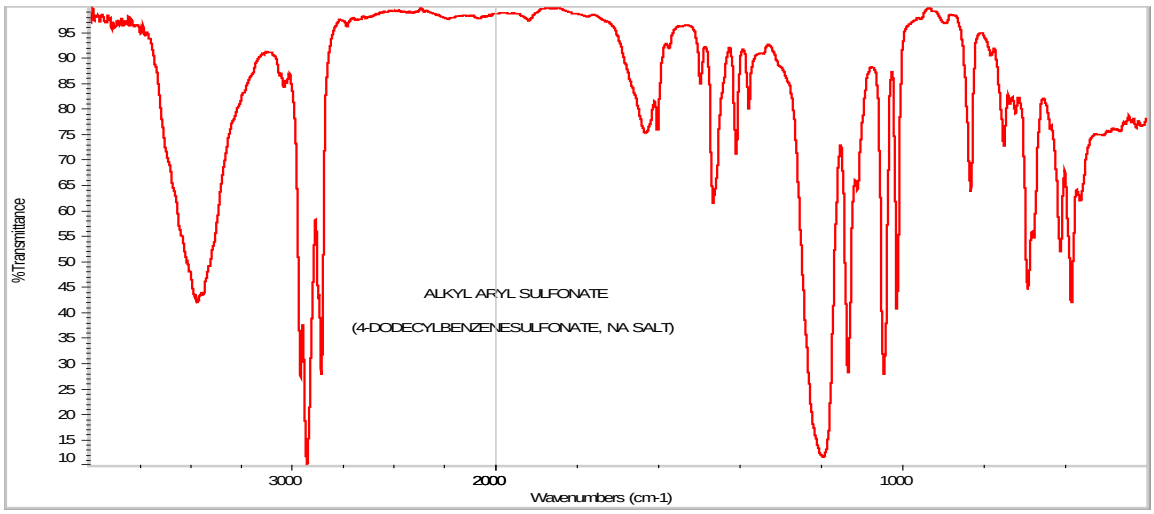
15
10
GLYCEROL MONOOLEATE REFERENCE
3000
2000
1000
Wavenumbers (cm-1)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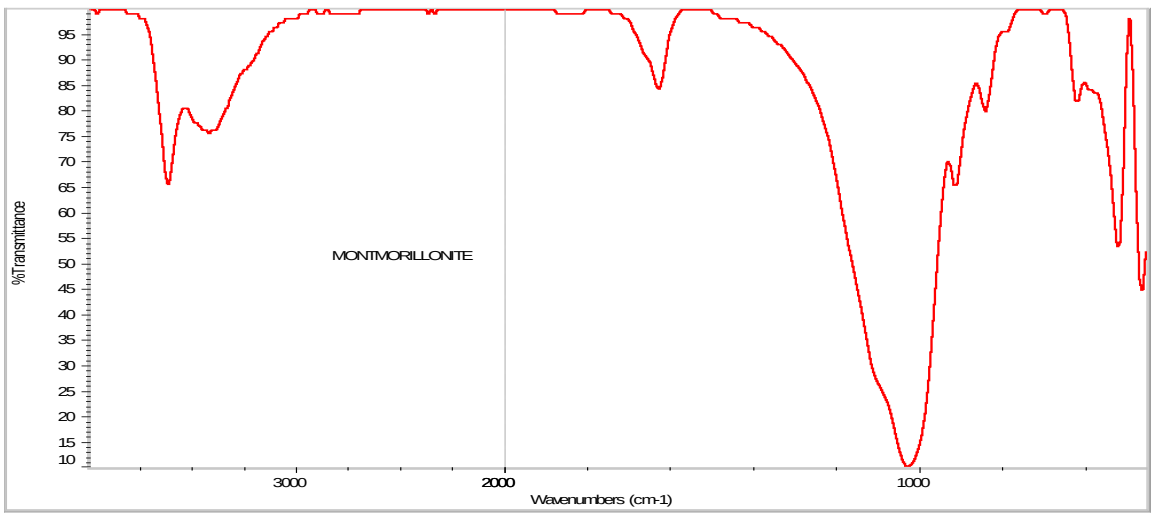
ALKYL ARYL SULFONATE
(4-DODECYLBENZENESULFONATE, NA SALT)
3000
2000
1000
Wavenumbers (cm-1)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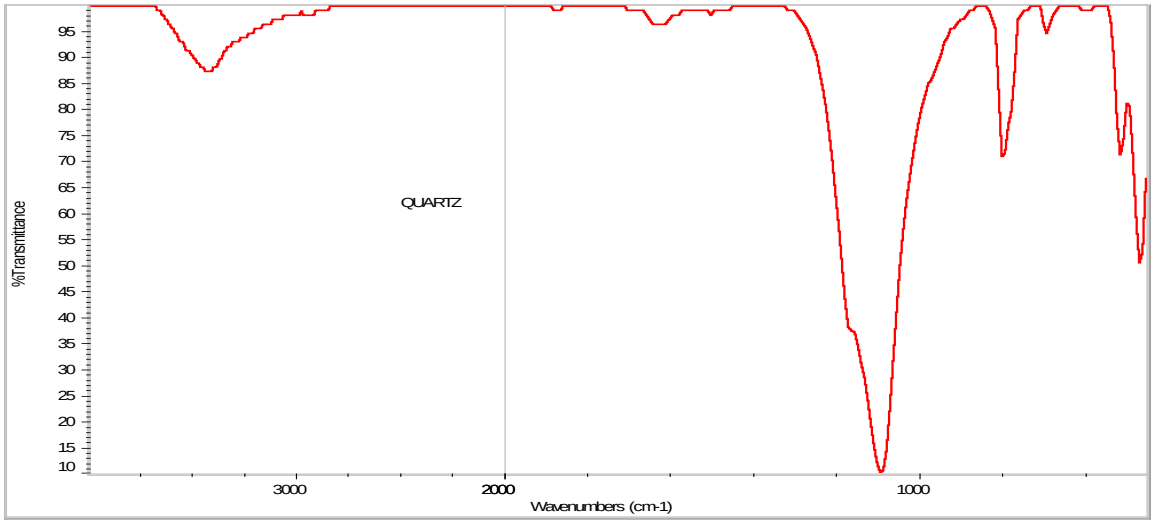
Wavenumbers (cm-1)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QUARTZ
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2000
1000
Wavenumbers (cm-1)

Avalon Foundation Analysis and Comments

Analysis of Residua from LMH Brazilian Case

16 April, 2003
N. A. Reiter

Background:

On 25th March, I received from PB several items from a case of anomalous activity in Brazil. The primary investigator on this case has been LMH. However very little was divulged to me regarding the particulars of the case. Received were the following:

1. A small round stone (approx. 2cm diameter) from the Brazil location, being broken into two parts by PB.
2. A sample of pink sandstone from the local region in Brazil.
3. A bag from LMH marked “sample 6” containing two white swatches of cloth, apparently heated or singed.
4. A bag from LMH marked “sample 1” containing a blue swatch of cloth, singed.
5. A bag marked “control #3)” containing an un-singed swatch of blue cloth.

Procedure and Results:

A - The small round stone:

A small grain of the dark brown stone was chipped loose from one of the halves, from a point about 2mm below the original outer surface. This was examined with our EDS (TN 5400 with light element detector).

We find primarily Fe, Si, O, and Al, with very minor amounts of K and Ti. See the attached EDS plot for this sample.

When the halves of the small stone were fitted together, the overall round oblate object highly resembled a common iron oxide / silica nodule popularly known as a “moqui marble” (slightly larger versions are called “boji balls” by collectors. These nodules or concretions are found typically in sandstone or areas that were river or sea beds in ancient times. They are formed much like pearls, by accretion of minerals from the water supply around a core that can be anything from a sand grain to a small rock. Moqui marbles can display an almost artificial appearance, in their disc like or spherical forms. They are a favorite of rock collectors, as well as New Age crystal healers who believe them to have curative

properties. In some areas of the US West, they can be purchased by the bucket-full along the road. They are easily available on-line or in rock and New Age shops.

In the case of the LMH sample, no readily visible core was seen, however as described, the original nucleation point can be miniscule.

For effective comparison, I took a moqui marble already in my own curio collection, and broke it open. A fragment of this was examined by EDS as well. As may be seen in the attached plot, the composition is nearly identical to the LMH artifact. My own moqui sample has a small peak of Mn instead of Ti, however variations in composition would be likely, varying with the local mineralogy of the area and the trace minerals in the local water when the stones were formed. A strong magnet was held up to both the LMH stone and my own sample – in neither case was any significant attraction to the magnet noted (stating that the iron oxide present was in a non-magnetic form). The sample was checked with our Baird Atomic Geiger counter, however no radioactivity was noted. The following links may be used to learn more about moqui and boji stones:

http://www.rocksandminerals.com/specimens/moqui.htm

http://www.geocities.com/CapeCanaveral/cockpit/8882/moqui.html

http://www.rocksandminerals.com/specimens/specimens.htm

B- The Pink Sandstone:

The pink sandstone provided by LMH is indeed composed of what one would presume usual sandstone to be made of. EDS shows Si, O, a small Al peak, and a very small signal for Fe. In one sense the fact that pink sandstone (iron rich) is prominent in the area of Brazil where the claims of the anomalous activity is very telling! Moqui marble stones are typically found in sandstone layers and deposits, as they are in the Escalante National Monument in Utah, USA. This may indicate that the moqui stones found under claimed anomalous conditions in Brazil may have a very local origin! To complete the comparison, an EDS analysis was made of the pinkish sandstone core of my own moqui stone. This is attached, and as may be seen, is typical of iron rich sandstone.

The Cloth Swatches:

The swatches of cloth presented a dilemma for my analysis, since EDS would tell us nothing. Even with light element detection, we would find only the expected components or C, O, and perhaps traces of other light elements from fabric dye. Thus, no EDS was attempted.

It had been suggested that somehow the scorched cloth displayed an anomalous blend of charring and melting, at a fiber level. This is likely a subjective statement. I discovered that on the "white" cloth (sample 6), the same essential effect could be produced with a clean soldering iron at a setting of 400 watts, pressed against the cloth. I marked this scorch mark with a black circle, to differentiate it from the as-received scorching. Color microscope photos were taken of both original and solder iron scorches on this piece, although the clarity and resolution left some to be desired.

The same protocol was tried on the blue cloth swatch, and again, the character of the melt/char was quite similar to the eye.

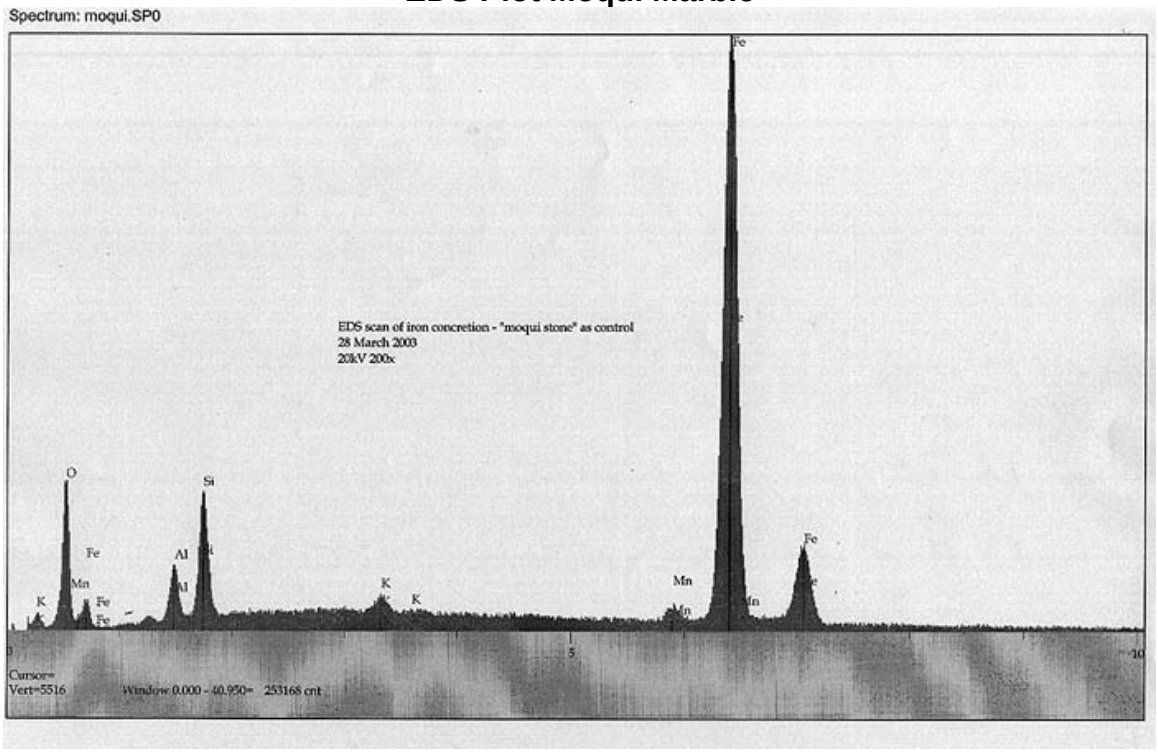
Discussion:

If we set aside and disregard the question of whether the materials submitted were found in anomalous circumstances, we find no real evidence for any unusual properties or nature of the materials themselves. The small round stone appears to be a common mineral concretion known as a "moqui marble" to rock collectors, mineralogists, and New Age aficionados. Such specimens are found typically with large deposits of sandstone, reflecting their method of formation by ancient water and iron rich silica gels. It should be of no surprise that the sample selected by LMH as being representative of the local geology would be pink iron rich sandstone. We would suspect that if a perusal of local souvenir shops or the rock collections of local children were done in that particular corner of Brazil, moqui marbles would be found in abundance!

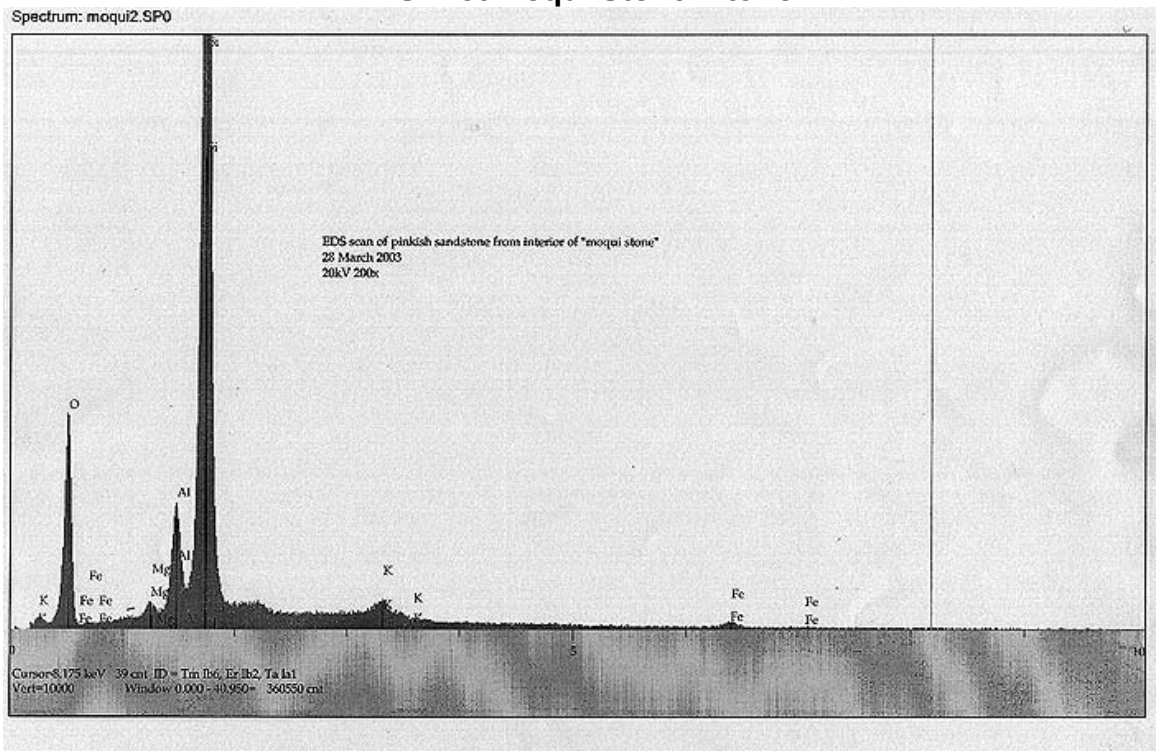
Little can be said about the textile swatches, apart from this researcher's opinion that similar looking scorch marks can be made with a simple soldering iron. We suspect that a larger clothing iron, a flat-iron, or otherwise heated flat stone or metal surface would be most effective at inflicting similar damage.

Avalon Foundation EDS Plots and SEM Photographs

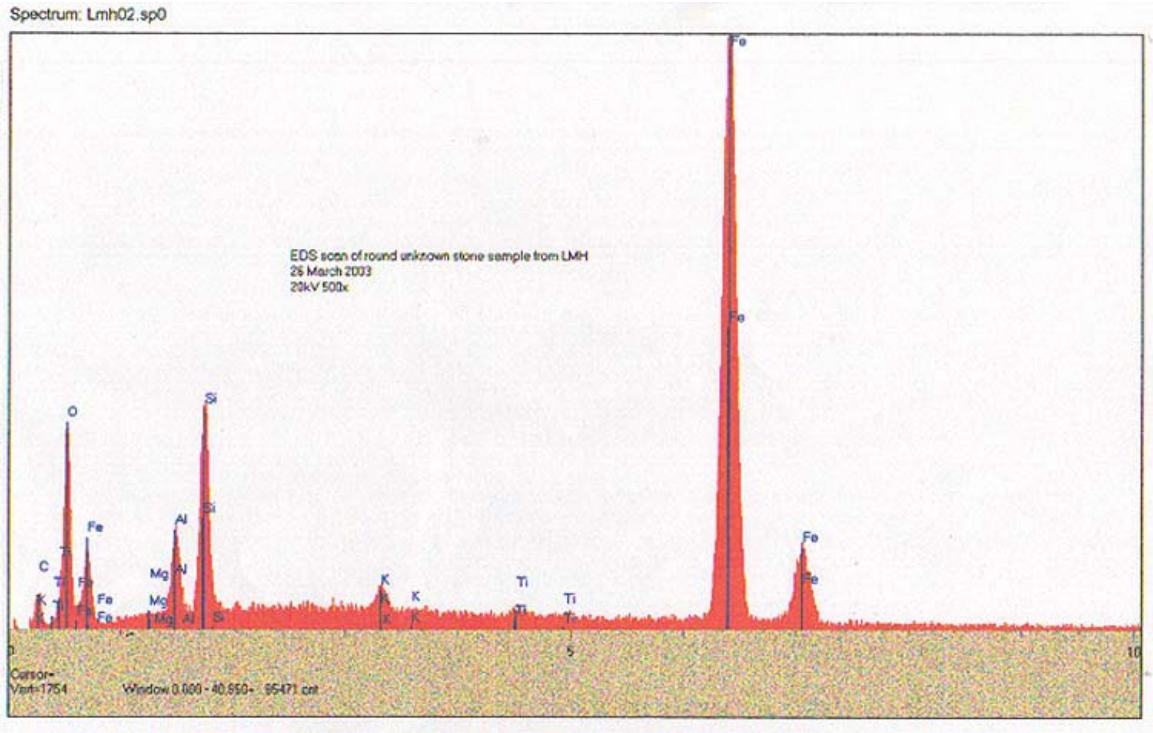
EDS Plot Moqui Marble



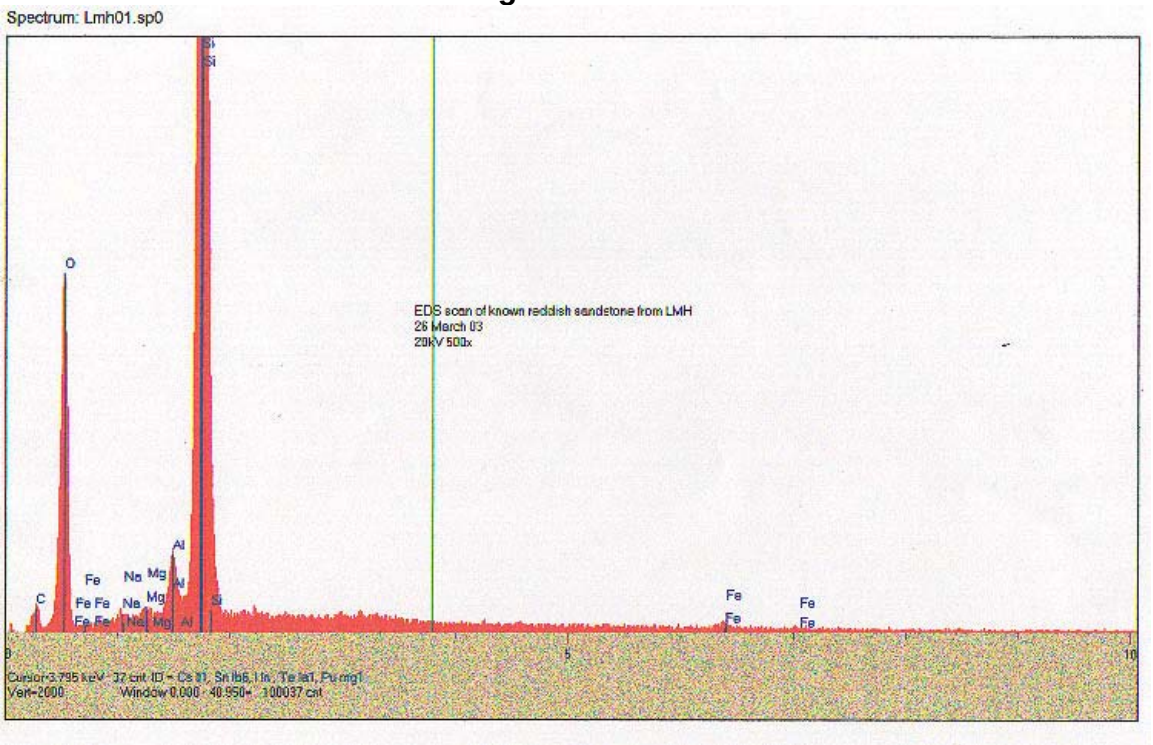
EDS Plot Moqui Stone Interior



EDS Plot Stone #2

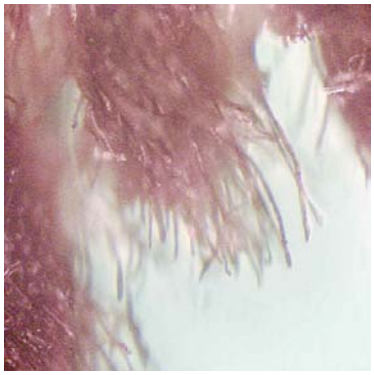


EDS Plot Corguinho Reference Rock

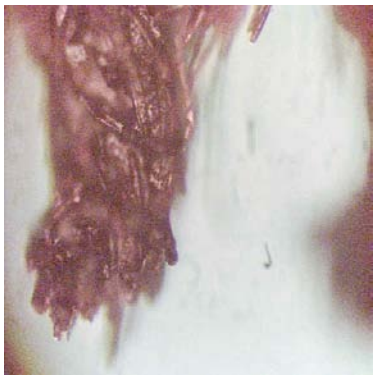


SEM Photographs Sample Burn Area and Soldering Iron Experiment

100X Burn Area



200x Burn Area



Soldering Iron Expt.