

## **Frontier Analysis, Ltd**

### **TECHNICAL SERVICE RESPONSE NO.: UT037**

**Subject:** Analysis of a Blue Substance found on a Victim After a Suspected Abduction in Southern Georgia, June 23, 2003.

**Date:** August 3, 2004

**Requested By:** Derrel Sims  
Saber Enterprises  
Houston, Texas

**Reported By:** P. A. Budinger  
Analytical Scientist

**Background/Objective:** Investigators Billy K. Rachels and Gordon Reeves provided the following background.

*“A south Georgia woman (name and location withheld by request) awoke on Monday, June 23, 2003 at 5:30 a.m. to a strange sight. Looking in the mirror she saw a dried blue substance all the way around her neck, a big blob on her hair on the back of her head, as well as some on the pillow case. Upon a closer look, there was a small amount on the palms of her hands, in between her fingers, and on the back of her arms between wrist and elbow. It looked like she had been trying to resist it being put on her. Her husband who had been sleeping right next to her had none on him, and the two small dogs who sleep with them had none on them. Checking the entire mobile home they could not find a source for the blue stuff plus all the windows and doors were still locked. If this is true – how did it get in the house and on her?”*

*I should point out this person has had many paranormal events in her life ever since she was a little girl. Some I have investigated in the past. I have found her to be very truthful. Because of this back history, I think this event is going to fall into the UFO field. Here is my guess on what happened. No. 1 - They beamed into the house and put it on her, or No. 2 – (the one I like best) they beamed her out and did it someplace else. Also let me add, the two small dogs who will bark at the slightest sound slept quietly all night long.*

*Now to the substance itself; first of all this does not glow in the dark as reported in some abduction cases. Let me tell you what we do know. The*

*stuff did not burn her skin, nor did it stain the skin, and she has suffered no ill effects from it. When it is dry it looks like water color paint, and when it is in water it is a beautiful turquoise blue (reminds me of blue Kool-Aid.) She said it washed right off, so it is not ink. She said it was highly concentrated as a quart washed off of her. She wanted to get it off and get to work and did not save any. But three days later she washed a hair bow she had been wearing that night and got a bathroom sink full of it and saved approximately a half of pint in a clean jar. It had dried on the pillowcase, but was also on the pillow meaning at some point it was wet. She said she dreamed something wet was being put on her, but has no other memory as to what really happened. It dissolves very easily in water and has only a slight scent to it. It appears to evaporate very quickly on the finger, like it has a drying agent in it. It appears when dry on cloth to burn at a very high temperature. She stated when water first hit it on the hair bow what looked like steam (but was not) came up, indicating some type of chemical reaction.”*

The object of this analysis is to identify the blue substance.

### **Conclusions:**

The substance is identified as mostly a mixture of **ethylenediaminetetraacetic acid (EDTA) salts**. Disodium copper EDTA (Na<sub>2</sub>Cu-EDTA) is one of the salts and gives the substance its blue color. The other salts are probably derivatives of sodium and possibly other metals, e.g. tetra sodium EDTA disodium magnesium EDTA etc. There is a small amount of poly(dimethylsiloxane). Also indicated is a trace amount of long chain carboxylic acid and probably ester. These later materials could be contaminants.

EDTA and its salts have a multitude of uses. Some include the following: detergents; liquid soaps; shampoos; agricultural chemical sprays; metal cleaning and plating; metal chelating agent; treatment of chlorosis; decontamination of radioactive surfaces; metal deactivator in vegetable oils, oil emulsions, pharmaceutical products, etc; anticoagulant of blood; eluting agent in ion exchange; to remove insoluble deposits of calcium and magnesium soaps; in textiles to improve dyeing, scouring, and detergent operations; antioxidant; clarification of liquids; analytical chemistry, spectrophotometric titration; aid in reducing blood cholesterol; in medicine to treat lead poisoning and calcinosis; food additive (preservative).<sup>1</sup> Some listings specifically for disodium copper EDTA include: a colorant in cosmetics;<sup>2</sup> a pesticide;<sup>3</sup> fertilizer;<sup>4</sup> for copper deficient soils.<sup>5</sup>

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<sup>1</sup> Richard J. Lewis Sr., “Hawley’s Condensed Chemical Dictionary”, Fourteenth Edition, John Wiley & Sons, Inc, New York, 2001..

<sup>2</sup> <http://vm.cfsan.fda.gov/~Ird/cf732120.html>.

<sup>3</sup> [http://www.pesticideinfo.org/Detail\\_ChemUse.jsp?Rec\\_Id=PC33301](http://www.pesticideinfo.org/Detail_ChemUse.jsp?Rec_Id=PC33301)

<sup>4</sup> PO Box 38, Bradford, West Yorkshire BD12 0JZ.

<sup>5</sup> Dissolvine® E-Cu-15 by Akzo Nobel Functional Chemicals bv.

**Procedure:**

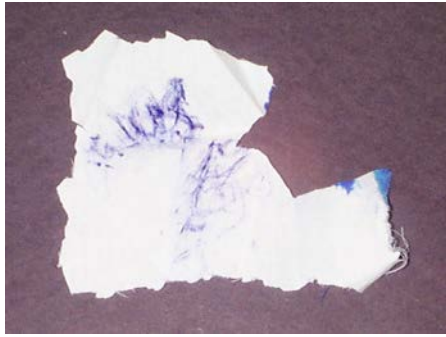
Two samples were submitted with the following information.

- Sample AAA – Blue shower water from the woman thought to be abducted. It was received in a vial. A photograph follows. (Note the blue color on the stopper.)

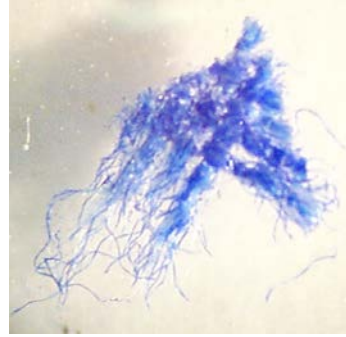


A drop of blue water was allowed to evaporate on the crystal of the Harrick SplitPea™ accessory on the Nicolet Avatar 360 FT-IR spectrometer. An infrared spectrum was obtained. Some water was passed through a Sep-Pak cartridge containing unbonded silica to concentrate and separate components present in the sample. The materials concentrated on the Sep-Pak were then eluted using progressively polar solvents: hexane; 1:1 acetone: methanol. The solvents were allowed to evaporate from the fractions at ambient temperature. Infrared spectra were obtained of the material in the initial water that passed through the Sep-Pak, and the desorbed materials from the hexane and acetone:methanol solvent extractions.

- Sample AAA - Pillow material containing the blue substance from the woman which also contains an “unstained” area for reference. Photographs of the sample follow.



**Regular Photo**



**Microscope Photo of Blue Fragment**

Infrared spectra were taken of the blue material on the pillowcase and of an unstained area for reference. A difference spectrum was then generated between the spectra of the blue and unstained areas to null out pillowcase interference.

Photographs were obtained of the samples using a Kodak digital Science MDS 120 camera. Microphotographs were also obtained using the Leika GZ6 stereomicroscope interfaced to the same camera.

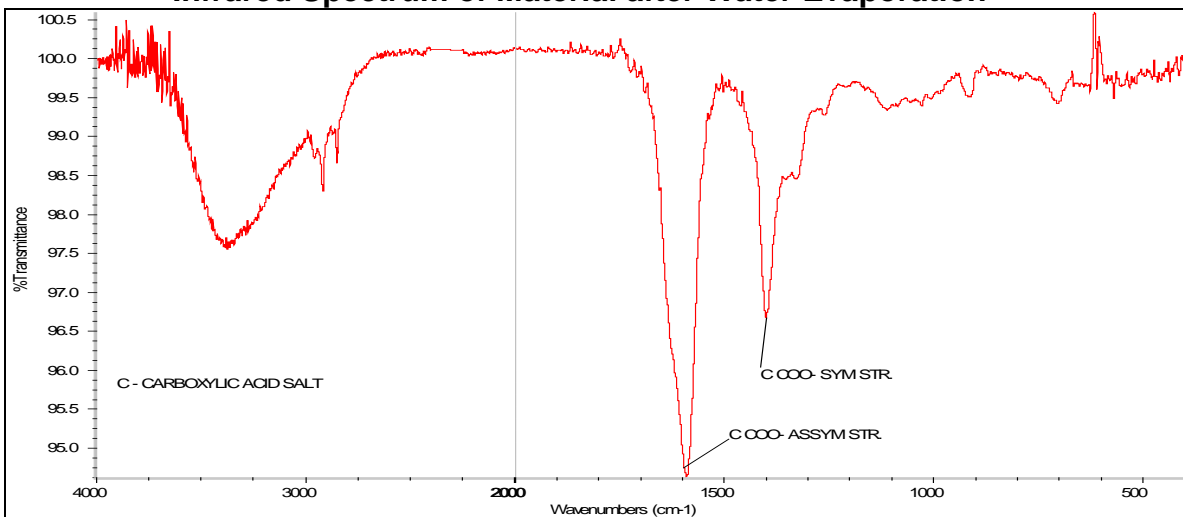
### **Results:**

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

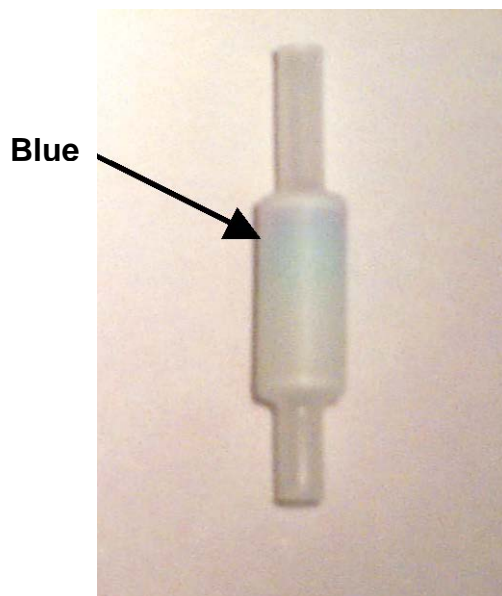
### **The Blue Water**

An infrared spectrum of sample after the water was allowed to evaporate is typical of a carboxylic acid salt(s). More specifically it compares to references of an ethylenediaminetetraacetic acid salts (commonly known as EDTA salts).

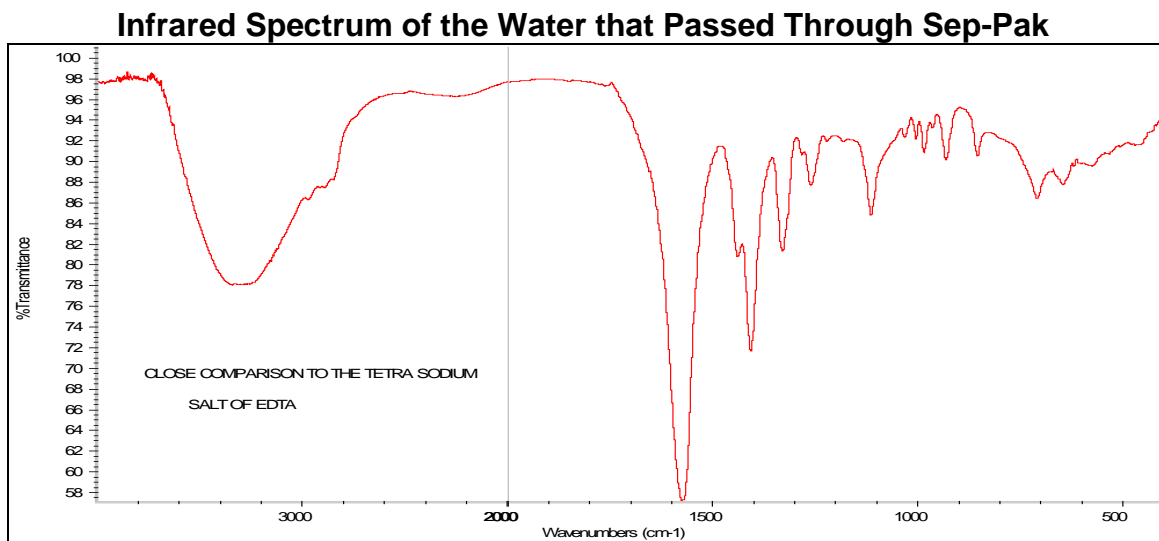
### **Infrared Spectrum of Material after Water Evaporation**



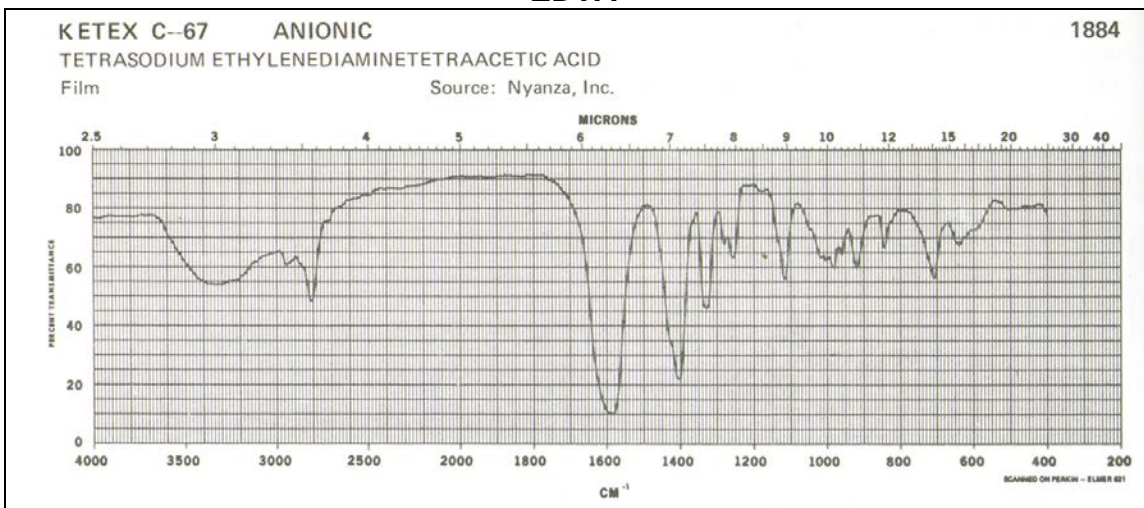
A Sep-Pak separation was done to fractionate the material using progressively polar solvents for a more specific identification of the EDTA cation types as well as any other components. A photograph of the Sep-Pak cartridge shows the blue material was successfully isolated. The blue material is at the top.



The first fractions (water pass through) were colorless. Infrared analysis indicates the substance in the water pass through is most likely tetra sodium EDTA. Following are spectra of this Sep-Pak fraction and a reference of tetra sodium EDTA for comparison.

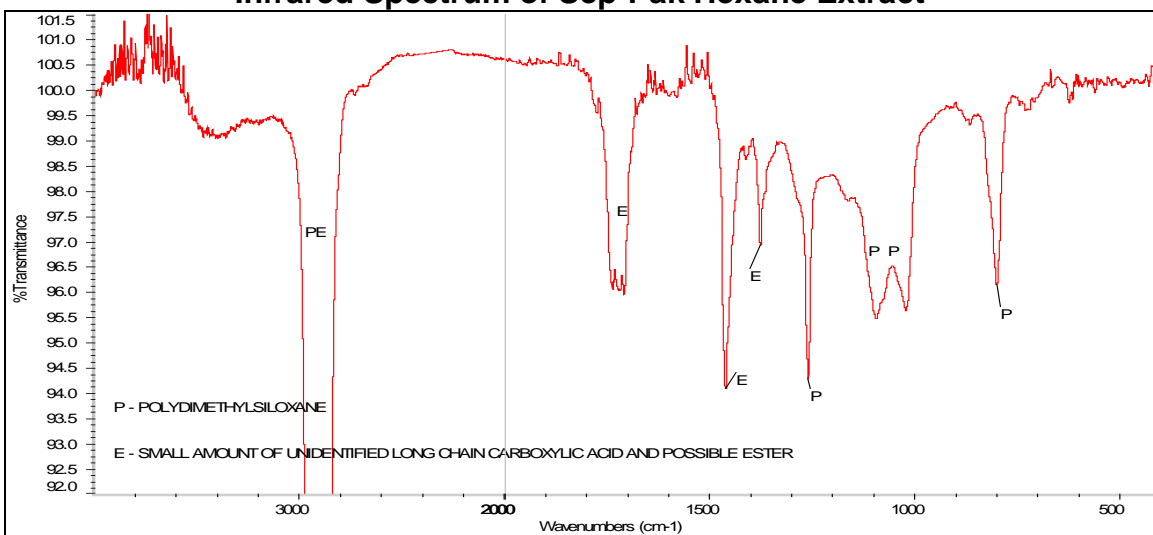


### Reference Infrared Spectrum of Tetra sodium EDTA<sup>6</sup>



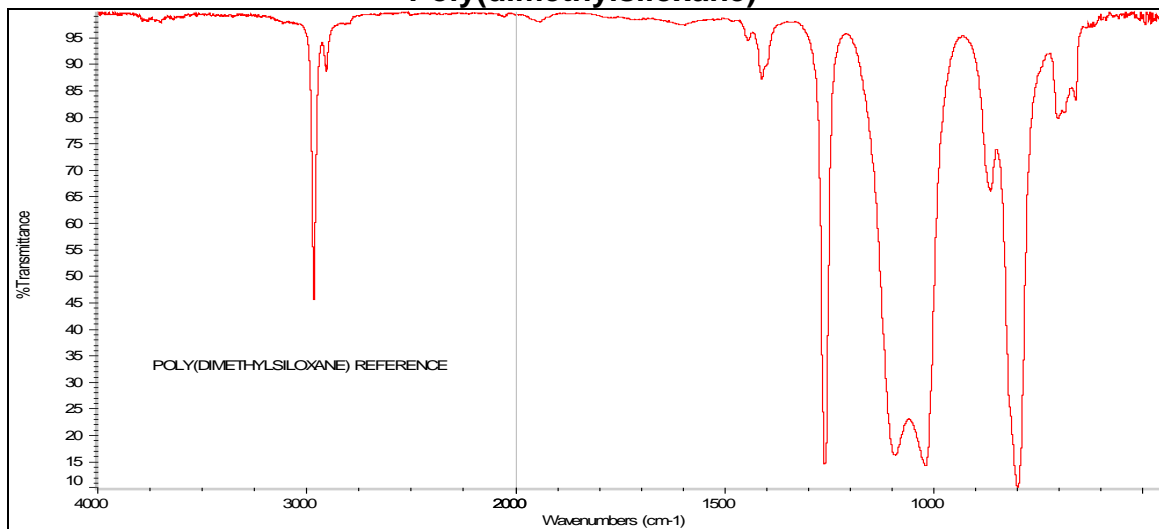
The hexane solubles were also colorless and in very small amounts. Infrared examination shows these are composed of poly(dimethylsiloxane) and an unidentified long chain free carboxylic acid and ester. Infrared spectra of the fraction and a reference of poly(dimethylsiloxane) follow.

### Infrared Spectrum of Sep-Pak Hexane Extract

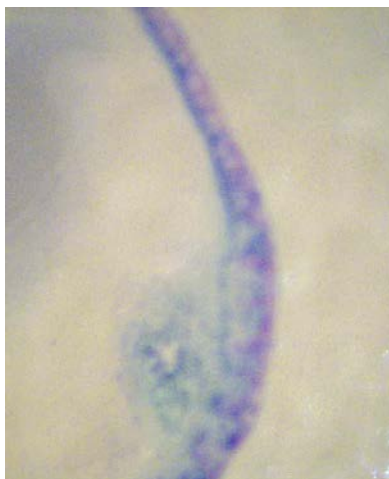


<sup>6</sup> "The Infrared Spectra Atlas of Surface Active Agents", Published by Sadtler Research Laboratories, Philadelphia, Pennsylvania, 1982.

### Reference Infrared Spectrum of Poly(dimethylsiloxane)



The 1:1 acetone:methanol Sep-Pak fraction was blue showing a concentration of the blue material. A microscope photograph showing the blue solid follows.

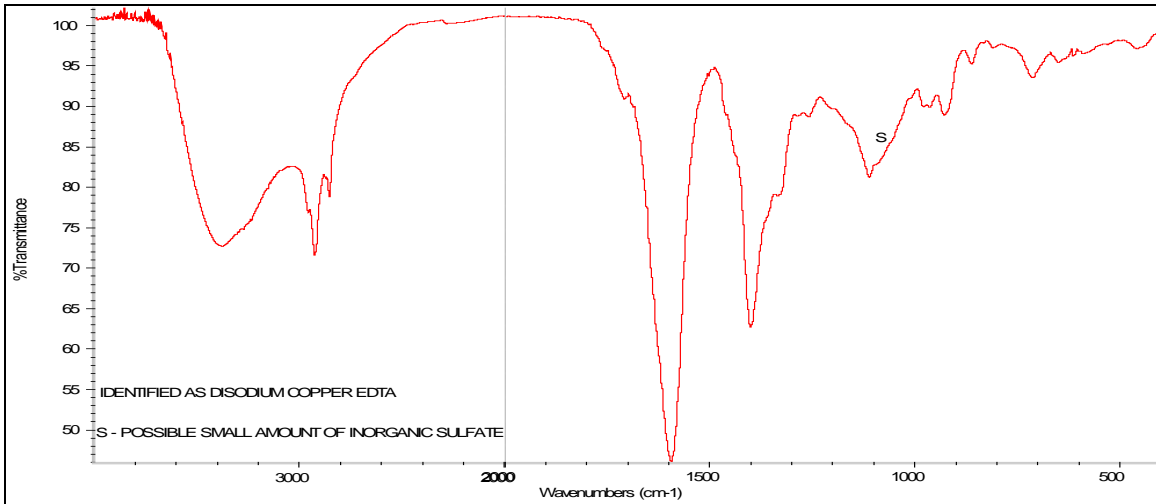


Infrared analysis also identified this fraction as an EDTA salt, but this time it is complexed with copper and sodium, more specifically 2Na-Cu EDTA. The spectrum compares to a reference of this material, and importantly the blue color is a giveaway. It is one of the few EDTA complexes that is blue.<sup>7</sup> A small amount of inorganic sulfate may be present. (The sulfate is probably from the water.) Following are spectra of the Sep-Pak fraction along with a reference of 2Na-Cu EDTA for comparison.

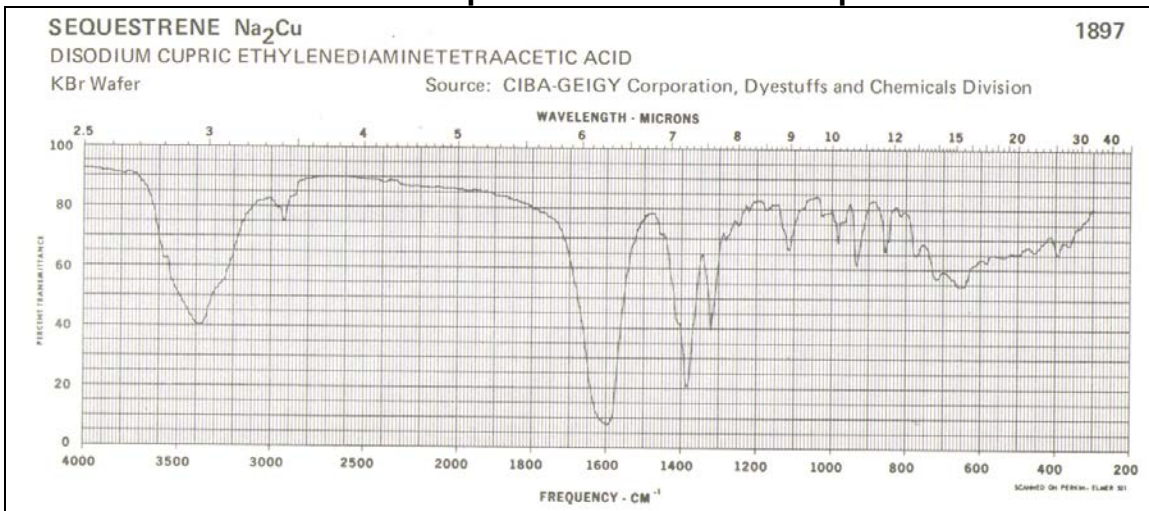
<sup>7</sup> <http://www.dojindo.com/newprod/3/chelater/mchelateb.html>.



### Infrared Spectrum of Sep-Pak 1:1 Acetone:Methanol Extract



### Reference Infrared Spectrum of Disodium Cupric EDTA<sup>8</sup>



### The Pillowcase

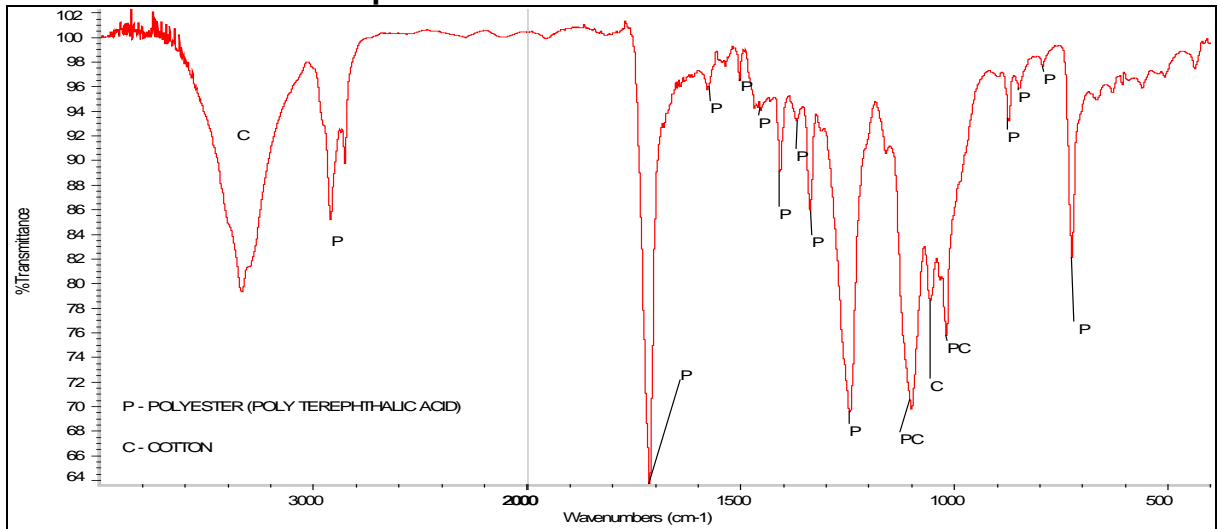
The analysis of the blue material on the pillowcase did not reveal any additional information. It did support the analytical results of the blue water. Following are the details of this analysis.

Infrared analysis of a clean area of the pillowcase shows the material is a blend of polyester and cotton. Following are the spectra of a clean area of the pillowcase as well as a reference of a polyester and cotton blend for comparison.

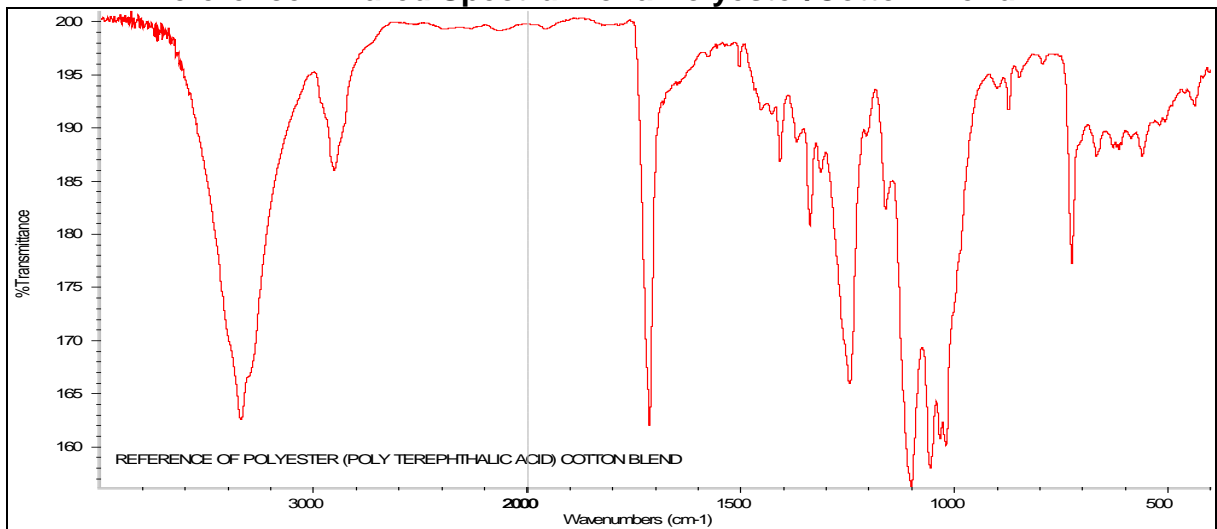
<sup>8</sup> Reference 7.



### Infrared Spectrum of the Pillowcase Clean Area

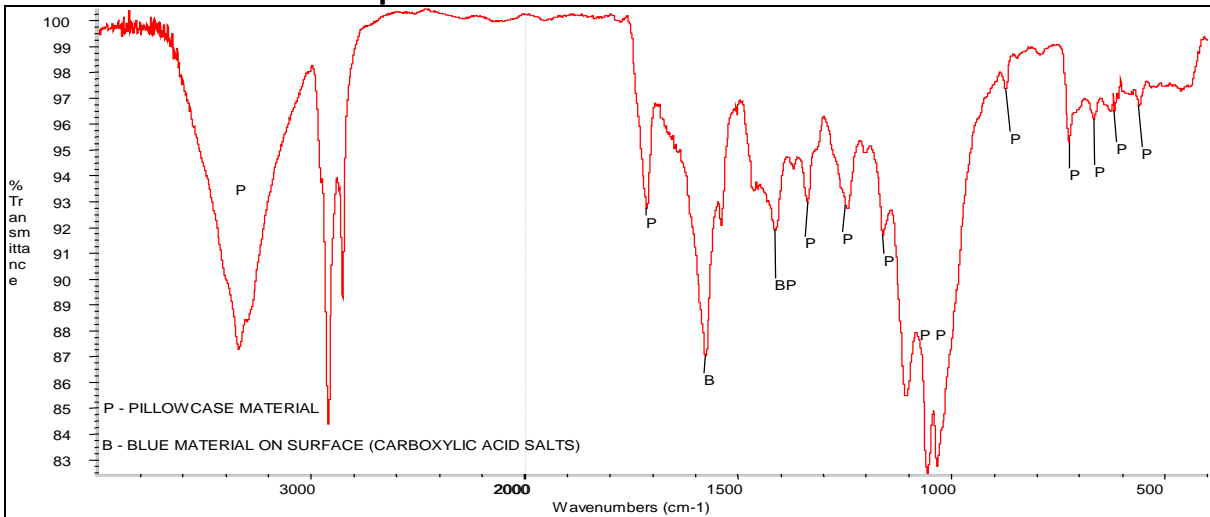


### Reference Infrared Spectrum of a Polyester/Cotton Blend



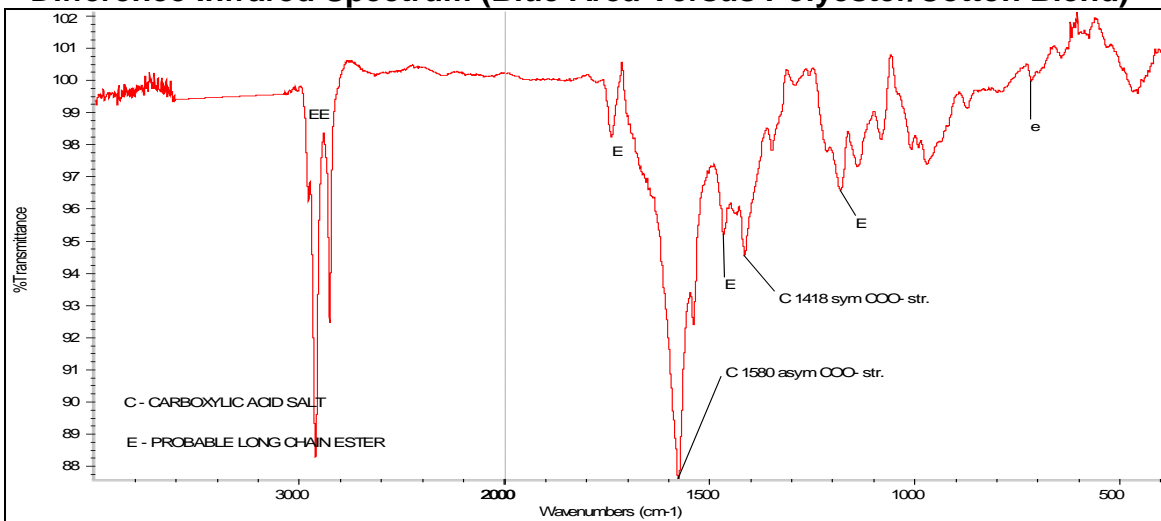
The infrared spectrum taken from the blue area of the pillowcase shows the pillowcase fabric and additional bands due to a carboxylic acid salt(s). The acid salt bands compare to the EDTA salts observed in the water sample. A spectrum follows.

### Infrared Spectrum of the Pillowcase Blue Area



An infrared difference spectrum was generated between the above spectrum versus a reference of polyester/cotton to null out the interfering bands from the pillowcase. This was done in an attempt to resolve additional bands from the EDTA salt for a more specific identification and to observe other components, which may be present. (Caution should be exercised in the interpretation of these data because band intensities may be skewed and anomalous bands may appear due to the computer massaging involved in generating the data.) The spectrum shows pronounced absorption from the EDTA salts. However, specific cations could not be determined with certainty. There is also indication of a long chain ester. These are materials detected and in some cases specifically identified in the water sample. Following is the spectrum.

### Difference Infrared Spectrum (Blue Area Versus Polyester/Cotton Blend)



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Distribution:  
Glenn Manuel