

Frontier Analysis, Ltd.

TECHNICAL SERVICE RESPONSE NO.: UT004

Subject: Analysis of Red Brown Materials from An Abductee's Hand

Date: July 8, 2000

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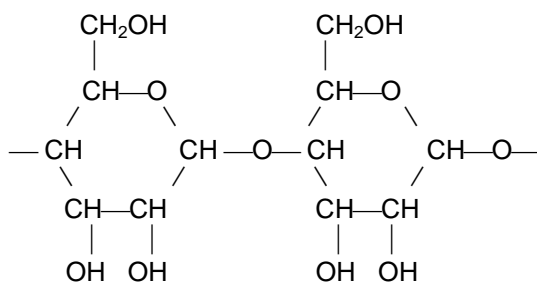
Background/Objective:

Orange brown colored materials were noted on the hands of an abductee after two different abduction events on June 8, 1998 and February 3, 1999. The materials were collected for analysis in order to characterize them in hopes it will provide information relating to the purpose of the events.

Conclusions:

1. The infrared data from the residue identified as "**original sample**" shows it is a mixture of components composed of primarily protein amide material which compares to references of human skin. Additionally suggested are small amounts of probable tissue paper and carbohydrate. A trace amount of a phosphonic acid ester is suggested, but this is very speculative.

2.) Infrared analysis of the "**2/3/99 Right Index**" sample shows it is also a multi component mixture. There are significant amounts of protein amide material (probably skin). Additionally, there is some carbohydrate polymer with the following repeating unit.



Also detected is a small amount of long chain glycerol fatty acid ester.

3.) Most of the materials suggested in this analysis can be attributed to biological materials found in the human body, i.e protein amide (skin), long chain glycerol fatty acid ester (lipid), and possible phosphonic acid ester. The carbohydrate is definitely foreign material and has a common structure found in many materials such as cornstarch, flour, bread, dehydrated potatoes, corn flakes, a starch polymer known commercially as Pullulan¹ and more. Paper was used to encase the “original sample” and has contaminated it slightly. This analyst can conjecture two possible sources for this combination of materials. The first: there was with so little material available that it could easily be contamination not only with human biological materials, but also the carbohydrate. The second: most of the components in the samples are related to the abduction event. One can speculate that the skin along with the other materials may be residuals from a biological test, e.g. skin scraping and some test ingredients (the carbohydrate).

4.) The component causing the red brown color is unidentified. However, this is not surprising because it only takes a few ppm (part per million) of material to produce color in a sample. So, the colorant is probably at such low concentration to render it undetectable by most tests.

5.) It is noted that a previous TIC (total ion chromatography) test was done by a clinical biochemistry laboratory. This is an inappropriate test for this type of sample because the sample must be soluble in ethanol, ethyl acetate, or other solvents. The predominant materials (skin and carbohydrate which are both polymeric) in this current FT-IR analysis are insoluble in solvents employed in the TIC test. Therefore, the solvent extract analyzed did not contain the sample. It is not surprising that these results were inconclusive. It was also noted in the TIC analysis they report, “This type of analysis is used routinely to identify small amounts of substances that may be present in clinical specimens”. It should be noted, that by using “routine” tests, if the sample doesn’t match the standard profile, then you usually will not pick up the anomalies.

¹ Pullulan is a starch-based polymer. It’s a biodegradable plastic (a trigluco polysaccharide).

6.) The information provided in this analysis will be compared to residues found after other abductions. If the same data is generated, it is hoped a pattern emerges which will provide proof for the abductions as well as establish possible reason.

7.) It is suggested that any future samples be submitted in aluminum foil or glass containers to prevent contamination.

Procedure:

Samples: The samples were received with the following identification:

- "Original Sample"
- "2/3/99 Right Index"
- "Plain Skin Scrapings" for reference

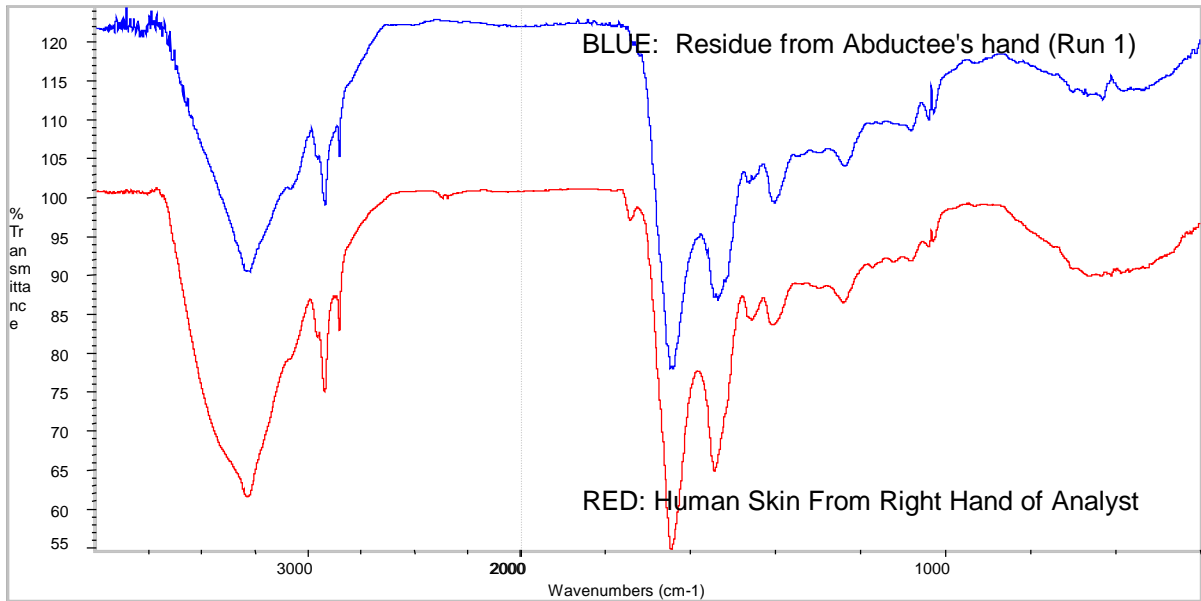
There were trace amounts of sample to work with (less than 1mg) which made the analysis quite tedious. However, with patience ATR FT-IR (Attenuated Total Reflectance Fourier Transform-Infrared) data were obtained from the "original sample" (four spectra) and from the "right index" sample (two spectra). There was not enough material from the reference skin sample for analysis. Therefore, a skin reference was obtained from the index finger of this analyst. Additionally, difference spectra of the residues versus that of the skin reference were also generated. The spectra were acquired on the Nicolet Avatar 360 spectrometer equipped with the Harrick SplitPea® cell. Microscope photographs were obtained from the Leica GZ6 stereomicroscope interfaced to a Kodak Digital Science MDS 120 camera.

Results:

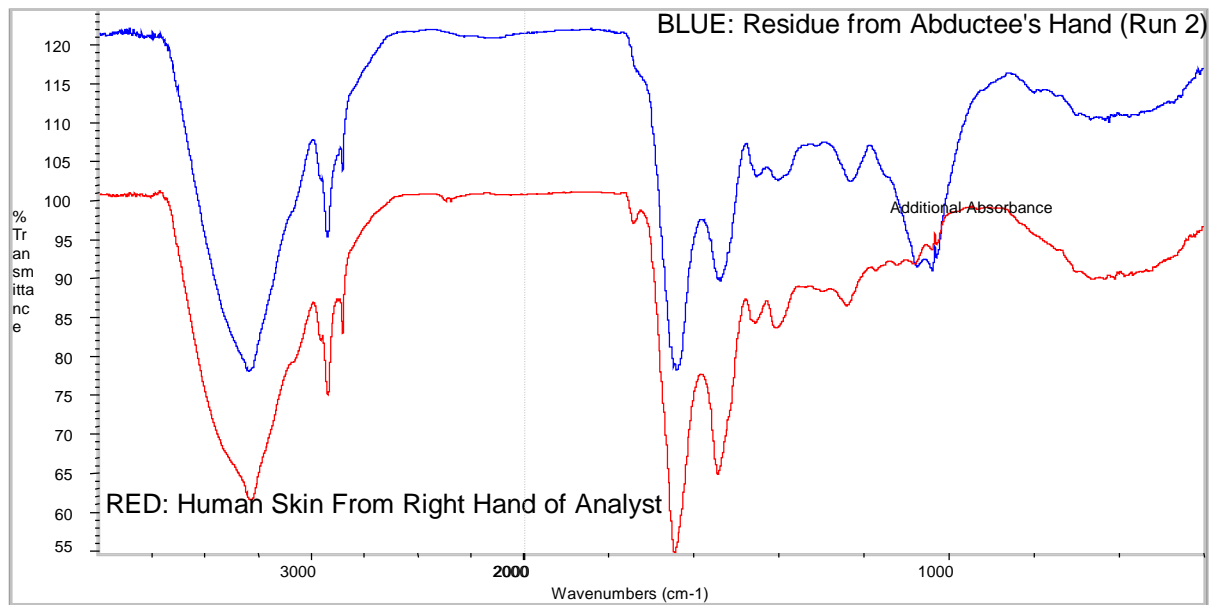
Original Sample:

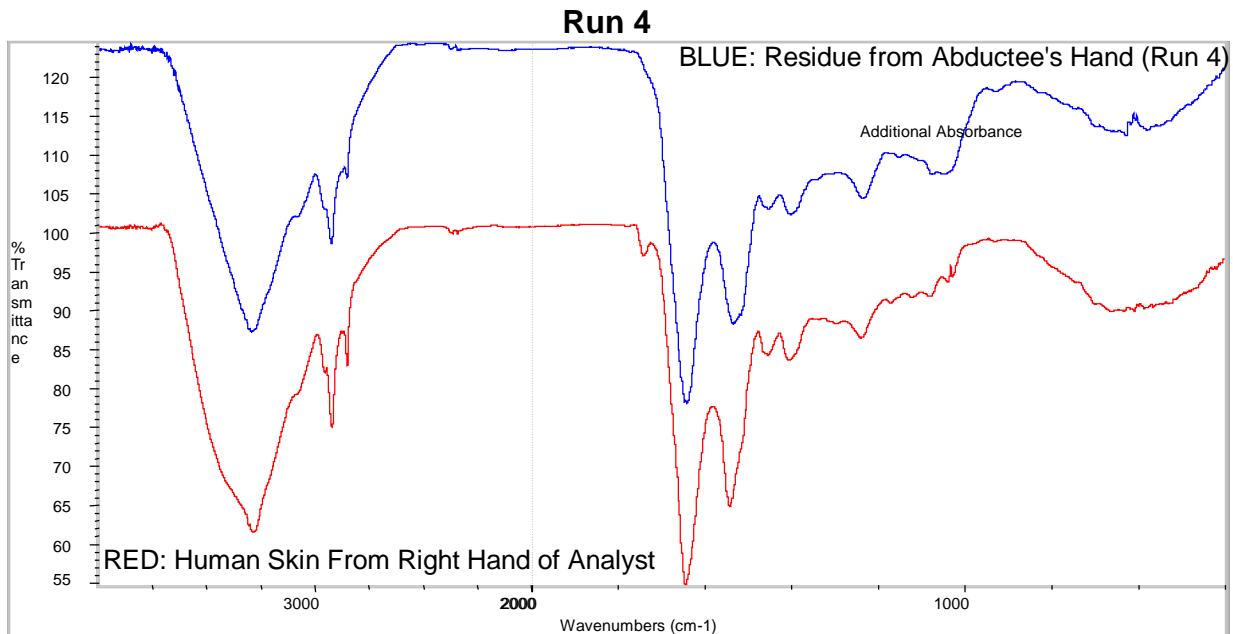
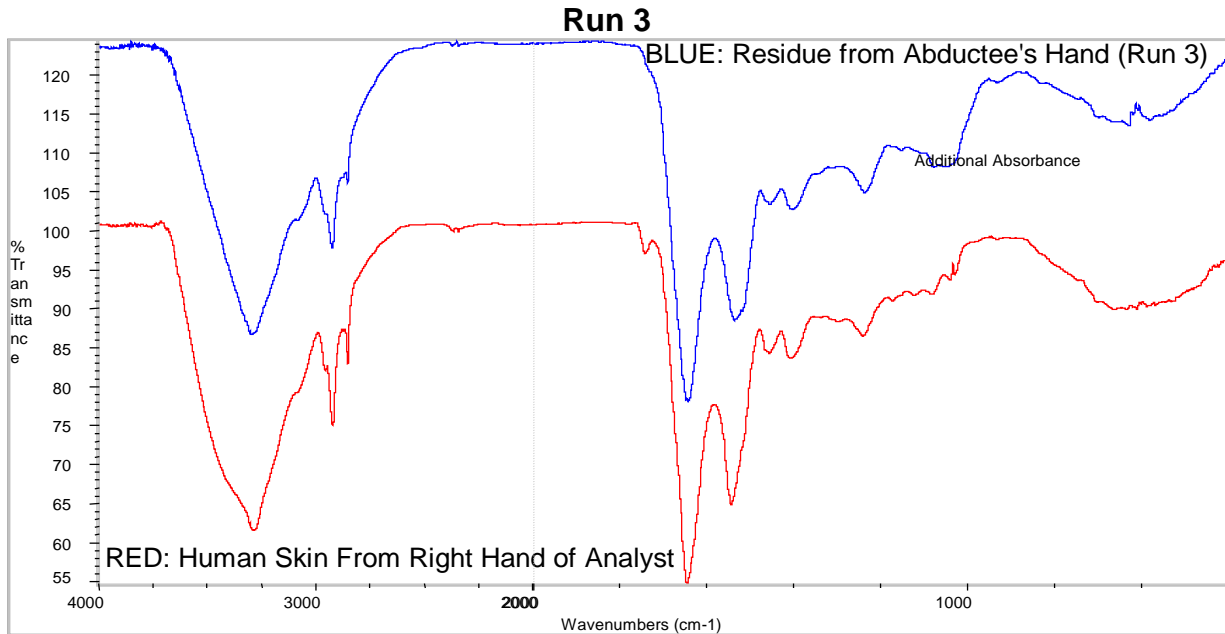
Four spectra were acquired from the "original" sample. For the most part they show a protein amide type material which is most likely from skin cells. The strongest bands compare to a skin reference of this analyst. There is also minor additional absorbance between $1300 - 1000 \text{ cm}^{-1}$ due to C-O stretching modes that are from a celluloidal material speculated to be contamination from the tissue paper that encased the sample and carbohydrate of unknown origin. Following are the spectra of the four samples.

Run 1



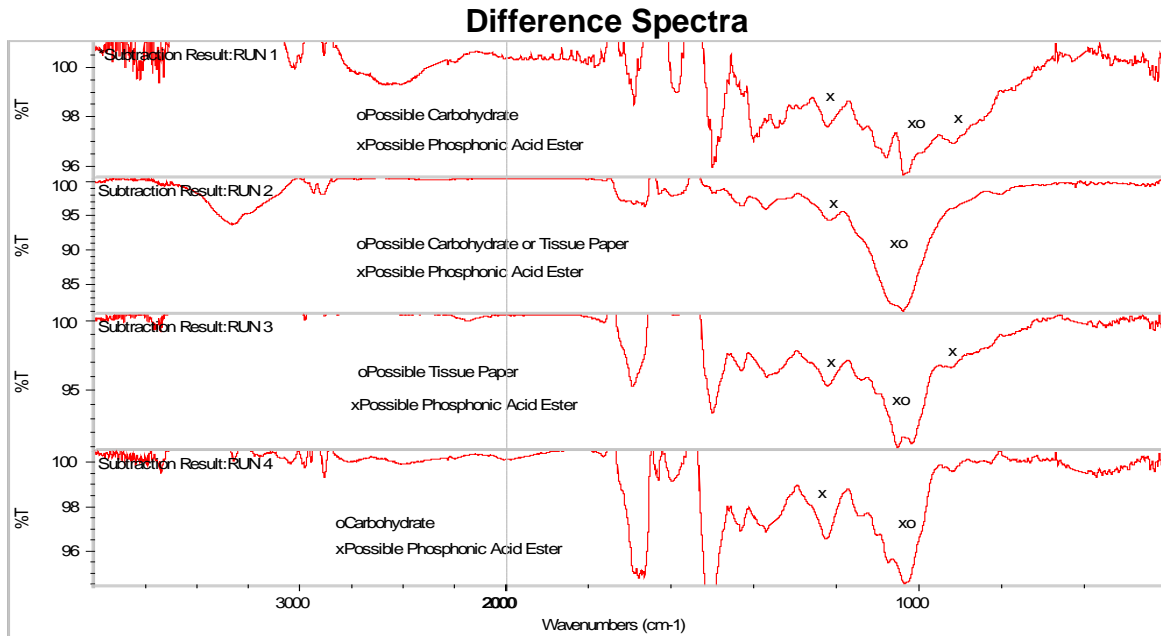
Run 2



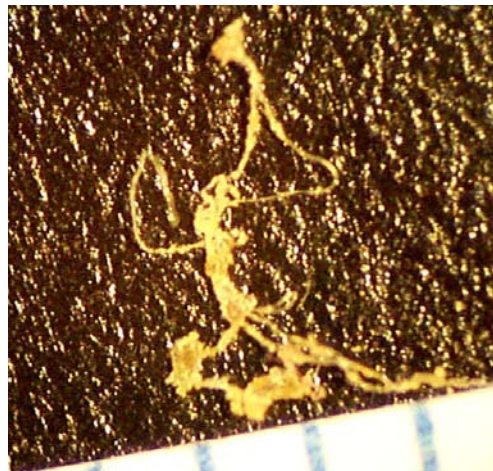


An attempt was made to subtract out the strong protein amide (skin) interference in the above abductee residue spectra. This was done to enhance the additional absorbance noted above and perhaps reveal additional bands which may be due to other substances. The strongest absorption reveals cellulosidal and carbohydrate material which appears to be from two possible sources. In runs 2 and 3 it may be due to tissue paper contamination. In runs 1, 2 and 4 there is a good possibility the source is a carbohydrate. Also noted in the runs is very subtle absorption which may represent a phosphonic acid ester. This last component is very speculative. The difference spectra follow. A number of reference spectra are included in the

appendix which include tissue paper from the sample container, cornstarch, flour, bread, dehydrated potatoes, corn flakes, a starch polymer known commercially as Pullulan.



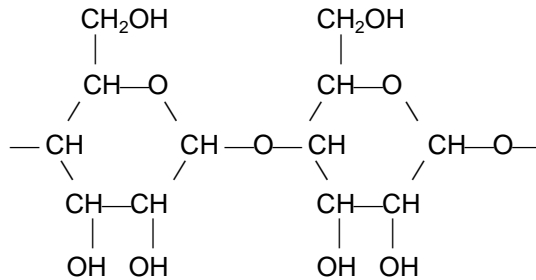
A microscope photograph of one of the particulates follows. The scale divisions in the photo correspond to 1 mm. This was the largest of the particulates. Note that fibrous material appears present. This is probably fiber from the tissue paper that contained the sample, which supports the infrared suggestions in some of the above runs.



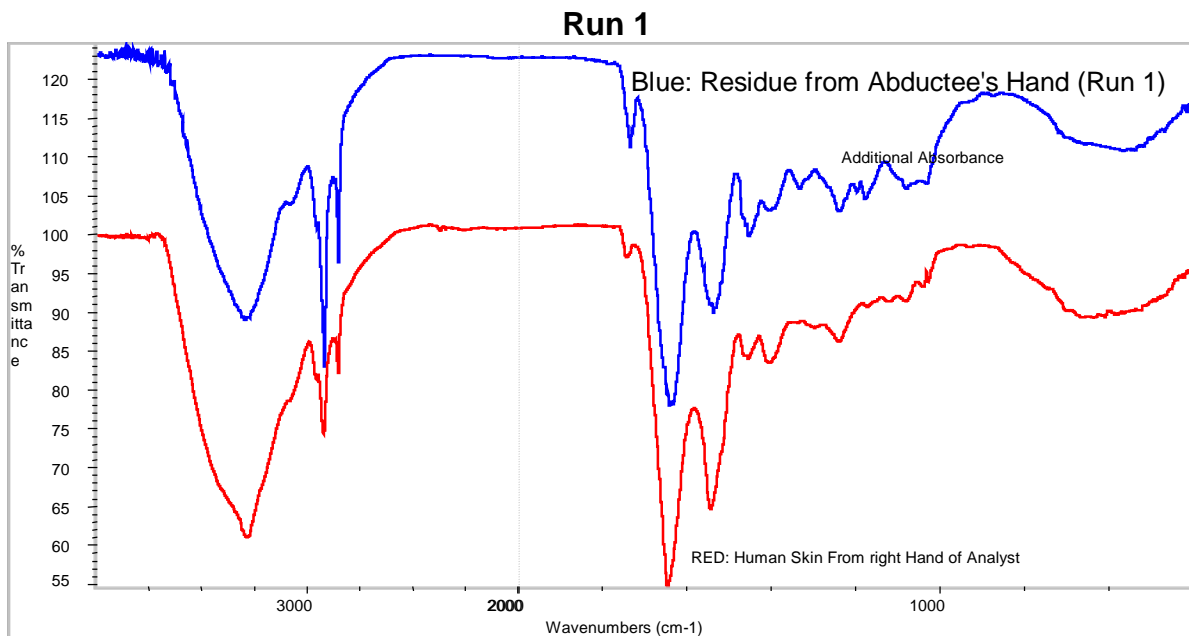
2/3/99 Right Index Finger Material:

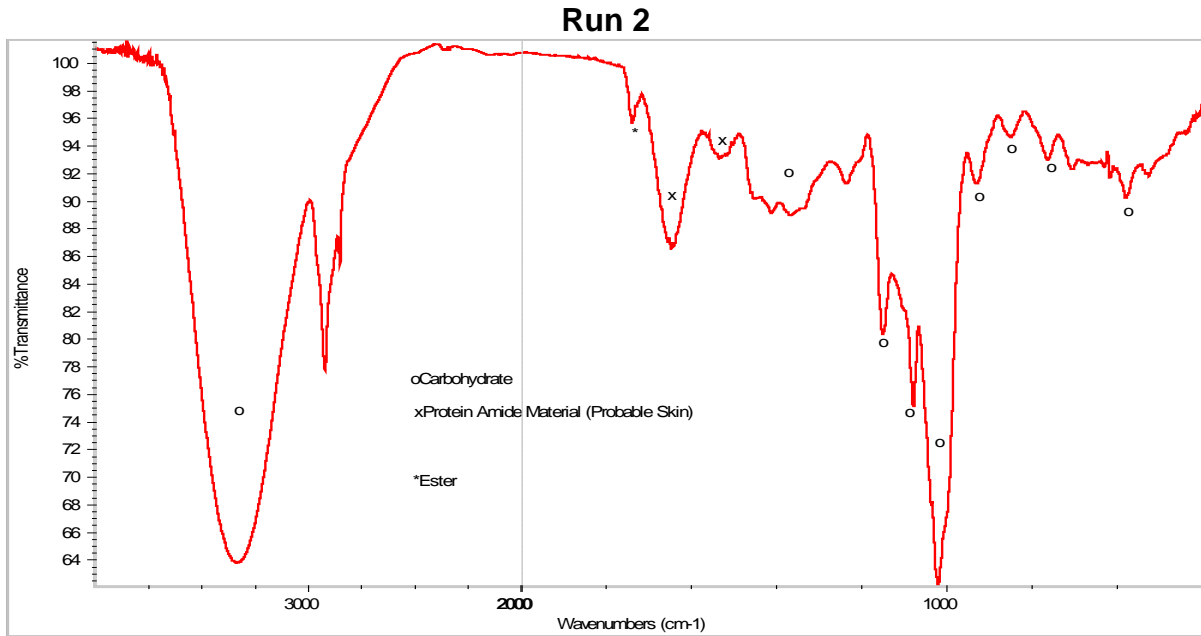
Two spectra of different particulates were acquired from this sample. The analysis of this sample was somewhat more prolific in information. The first run shows

evidence of primarily protein amide material (probably skin) and minor amounts of ester and perhaps a carbohydrate. However, the second run is primarily carbohydrate with a small amount of protein amide and ester. The carbohydrate is specifically a polymer with the repeating unit displayed below. These bands essentially match those reference spectra of cornstarch, flour, bread, dehydrated potatoes, corn flakes, and a starch polymer known commercially as Pullulan, which are displayed in the appendix. The structure follows.

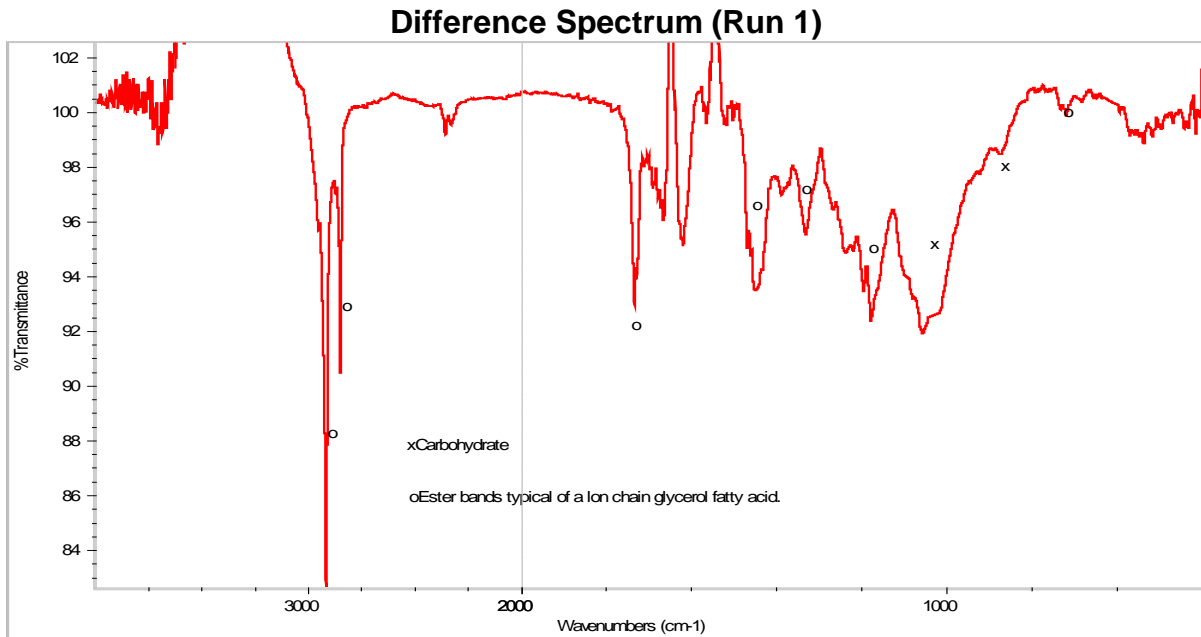


The spectra from both runs follow.

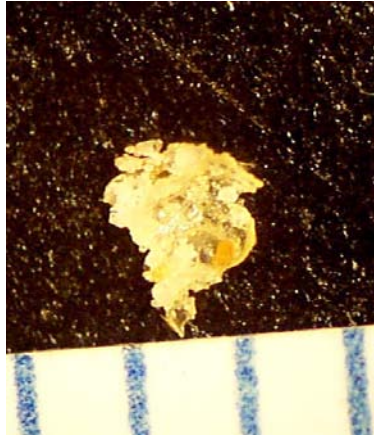




A difference spectrum between the run 1 particulate and the skin reference was generated to determine whether the same carbohydrate detected in run 2 is present and for information regarding any additional components. This spectrum does show a carbohydrate but it is inconclusive whether it is the same species. Also detected a fatty acid glycerol ester. The latter component could be from natural oils of the hand. The spectrum follows.



A microscope photograph of a particle follows. As in the previous photo the scale division represents 1 mm.



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