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LABORATORY REPORT

Advanced
Materials
Center, Inc.

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To: The Waste Reduction Store
Kathleen Boylan

Date: July 31, 2009
Project: 09P1201 FTIR/DSC

Purpose:

Evaluate four (4) samples for material composition using FTIR infrared spectrometry and DSC Differential Scanning Calorimeter.

Sample Identification:

- A. Black Plate – 18.0 mil
- B. Black Clamshell – 18.5 mil
- C. Black Spoon
- D. Cream/Tan Knife

Source:

Gallimore
Gallimore
Gallimore
Gallimore

Conclusions:

In our opinion, based on our FTIR and DSC analysis of the plate and clamshell, the major components are polyethylene and corn starch.

The cutlery samples (C & D) were similarly found to be composed of polypropylene and corn starch.

Calcium carbonate was also found in the FTIR analysis to be present in all four (4) samples.

The polyethylene and polypropylene present in the samples will not biodegrade in composting operations and therefore do not meet ASTM D 6400-04 requirements.

Results:

The FTIR spectra and DSC Thermal analysis of the samples were obtained to ID the material composition of each sample and are attached for reference.

The spectrum for the Black Plate (Sample A) is composed of polyethylene, corn starch and calcium carbonate.
The spectrum for the Black Clamshell (Sample B) is composed of polyethylene, corn starch and calcium carbonate.
The spectrum for the Black Spoon (Sample C) is composed of polypropylene, corn starch and calcium carbonate.
The spectrum for the Cream/Tan Knife (Sample D) is composed of polypropylene, corn starch and calcium carbonate.

The DSC analysis found the Black Plate material had a melt range peak at 129.64° C, corresponding to polyethylene.
The DSC analysis found the Black Clamshell material had a melt range peak at 128.98° C, corresponding to polyethylene.
The DSC analysis found the Black Spoon material had a melt range peak at 168.30° C, corresponding to polypropylene.
The DSC analysis found the Cream/Tan Knife material had a melt range peak at 165.97° C, corresponding to polypropylene.

Discussion / Experimental:

Samples A to D were evaluated using a Perkin Elmer Spectrum 100 FTIR infrared spectrometer fitted with a diamond ATR module. The DSC thermal analysis was conducted using a Perkin Elmer DSC Series Seven Thermal Analyzer upgraded with a Temperature Programmer Interface using Windows XP Pro.

The samples evaluated were taken from the four products submitted.

The FTIR spectra and DSC plots are attached for reference and review.



Greg Geil

Environmental Scientist

Attachments: FTIR Spectra, DSC Plots