

Analytical Report

Earth Care Products

NWL Lot: 338210
NWL Report: 606825
Report Date: 2004-10-08

Project: Oil Absorbent Efficiency
Project ID: Sphag Sorb
Samples: Sphag Sorb

Objective:

To determine the efficiency of Sphag Sorb absorbent material on oil products.

Sample Requirements:

Peat/Oil Ratio	= 0.23 g/mL (0.5 lb/1 L Water)
Water	= 500 g
10W30 Motor Oil (~30%)	= 150 g

Experimental Protocol:

1. Determine and record oil density.
2. In 1000mL beaker weigh (~500 g) and record mass of water.
3. Add oil to water (~150 g) and record mass of oil.
4. Calculate mass of peat required based on Peat/Oil ratio.
5. Add peat to water/oil mixture and record mass.
6. Let stand 10 minutes.
7. Gravity filter mixture and collect filtrate.**
8. Weigh filtrate collected.
9. Perform O/G analysis on filtrate.
10. Perform Dean Stark analysis on filtered solids (peat/oil mixture).
11. Calculate % solids, % water, % oil in peat.
12. Calculate mass balance and calculate recovery.
13. Calculate peat efficiency. (% Recovery of Oil Product)

***Filter is water wetted prior to filtration to avoid oil absorption.*

Observations:

- 1.85 cm oil layer measured on water surface
- 3.75 cm peat layer measured after 4 minute contact with oil/water mixture.
- 1.75 cm high dark region in peat from water oil interface after 4 minute contact.
- No other visible changes from 4 to 10 minutes from first contact.
- No color change from original observed in remaining 2.00cm layer. Remaining peat appears dry.

Physical Property Data

Density of Oil @ 15°C	0.8756 g/mL	Sample ID: 1313721 NWL De-ionized Water
Density of Water @ 15°C	0.9998 g/mL	
Volume of Oil	111.9 mL	
Volume of Water	505.9 mL	
Total Volume	617.8 mL	
% Oil by Volume	18.1%	
% Water by Volume	81.9%	
Depth of Oil Layer	1.85 cm	
Depth of Peat Layer	3.75 cm	

Experimental Data

Pre-Treatment						
	Total	Oil (g)	Peat (g)	Water (g)		
Initial Mass of Sample	627.3 g	98.0	23.5	505.8		
Post Treatment						
	Total	% Oil	% Peat	% Water	Sample ID	Lot Ref
Peat Analysis	100.0 %	59.1	13.3	27.5	1308803	-1
Water	100.000 %	0.002	0.0	99.998	1308804	-2
Mass of Residue Peat/Oil	1.6 g	0.9	0.2	0.4		
Mass of Filtrate Water	459.4 g	0.009	0.00	459.4		
Mass of Solids (Wet)	165.2 g	97.7	22.0	45.5		
Total Mass Recovered	626.2 g	98.7	22.2	505.3		
% Recovery	99.8%	100.7%	94.5%	99.9%		

Conclusion:

The efficiency of the Sphag sorb was 100% on Esso Protec Extra 10W30 Oil as per the experimental parameters. The % recovery of Oil after treatment indicates the absorbency of the product.

The loss of peat may be due to dissolution of the peat into the oil and/or solvents used in extraction. It is also reasonable to assume that the greater than 100% recovery is the result of peat dissolution and therefore the additional mass in the oil recovered.

Methodology and Notes:

Method of Analysis:

Density of Liquid - ASTM D 4052-96

Standard Test Method for Density and Relative Density of Liquids by Digital Density Method,

Oil and Grease in water

*APHA 5520 B Oil and Grease: Partition-Gravimetric Method

Oil in soil by Dean-Stark

*ACOSA Determination of the Bitumen, Water and Solids in Oil Sand,

* Norwest method(s) is based on reference method

References:

APHA Standard Methods for the Examination of Water and Wastewater

ASTM Annual Book of ASTM Standards

Dean-Stark ACOSA Reference Method

Comments:

Sample 2 (Filtrate) was given an extra aliquot of hexane during extraction. BS Oct 15/04

The sample volume used for O/G extraction did not meet the sample requirement of 950 ml. Only 458 ml was provided for analysis. BS Oct 14/04

Approved by: _____ Dave Murray *Manager, Oil & Gas Operations*