

MODIFICATION OF LEONARDITE FOR USE AS A DRILLING FLUID



RESEARCH COOPERATORS

S. M. Ibrahim and T. B. Goh,
*Dept. of Soil Science,
University of Manitoba.*

TRIAL OBJECTIVE

To modify humic material by adding base and salt to reach complete dispersability and the highest solubility.

EXPERIMENTAL – DESIGN

Experiment	Fulvic Acid (Included)	KOH (M)	FeCl ₃ (%)	FeSO ₄ (%)
1	Yes, No	0, 0, 1, 1.0	0	0
2	Yes, No	0.1	5, 7, 10	0
3	Yes, No	1	10	10
4	Yes, No	2	10	10

Five (5) grams of humic material was mixed with 100 mL KOH and 0.5 g salts at different concentrations. Parameters to be measured included pH, density, dispersibility and solubility.

CERTIFICATIONS

Black Earth Humic products are:

- » Listed by OMRI
- » Registered with CFIA
- » Certified for use for NOP
- » Certified by the CDFA



RESULTS

Considering solubility and dispersibility, product modified by 2.0 M KOH was the best use as drilling fluid. Both iron salts showed no significant difference in dispersibility and solubility. The best results were the ones with higher pH values. Fulvic acid was best separated as it resulted in lower pH values.

Sample	KOH (M)	Fulvic Acid (Included)	FeCl ₃ (%)	FeSO ₄ (%)	pH	Density (g/cm ³)	Dispersibility	Solubility (%)
Control	0	Yes	5	0	4.3	0.760	None	0
A-1	0.1	Yes	5	0	4.4	0.762	None	0
A-2	0.1	No	5	0	5.4	0.769	Partial	0.56
A-3	0.1	Yes	7	0	4.3	0.760	None	0
A-4	0.1	No	7	0	5.4	0.773	Partial	0.12
A-5	0.1	Yes	10	0	3a.7	0.656	None	0
A-6	0.1	No	10	0	5.3	0.769	None	0
B-1	0.1	Yes	0	0	7.1	0.890	Partial	0.92
B-2	0.1	No	0	0	5.9	1.897	Partial	1.12
B-3	1.0	Yes	0	0	12.3	1.149	Complete	1.69
B-4	1.0	No	0	0	11.9	1.120	Complete	1.66
C-1	1.0	Yes	10	0	13.7	1.122	Complete	1.65
C-2	2.0	Yes	10	0	14.0	1.173	Complete	1.75
C-3	1.0	No	10	0	13.6	1.175	Complete	1.43
C-4	2.0	No	10	0	13.9	1.201	Complete	1.69
C-5	1.0	No	0	10	13.6	1.112	Complete	1.63
C-6	2.0	Yes	0	10	13.8	1.100	Complete	1.39
C-7	1.0	No	0	10	14.0	1.145	Complete	1.66
C-8	2.0	Yes	0	10	13.9	1.110	Complete	1.61

Calgary & Edmonton, Alberta Canada 780-453-2100
sales@blackearth.com | www.blackearth.com

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