UTAH STATE DEPT of NATURAL RESOURCES
DIVISION OF OIL, GAS & MINING
3 TRIAD CENTER, SUITE 350

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DIVISION OF
OIL, GAS & MINING

SCOTT JOHNSON

Per your inquiry the other day regarding analysis of typical clay materials I would furnish the following information.

A clay material by mineralogical analysis would show a major fraction of:

any or all
- KAOLIN or KAOLINITE
- MONTMORILLONITE
- HALLOYSITE
- PYROPHYLITE

a minor or trace fraction of:

any or all
- QUARTZ or SILICA (could be major)
- FELDSPAR
- MICA
- TALC
- HEMATITE
- DOLOMITE
- CHLORITES
- BORAX

Nearly all fired clay materials have a common mineralogical identity - MULLITE.

Nearly all clays, when fired produce MULLITE

If MULLITE is present in the fired product - Clay was one of the raw materials.

By chemical analysis clay type materials generally run as follows:

Alumina	Al_2O_3	18 - 35 %	These are the 2 main items by chem analysis
Silica	SiO_2	60 - 70 %	
Subtotal		88 - 95 %	
Titania	TiO_2	.5 to 2.0 %	
Calcia	CaO	.5 to 2.0 %	
Alkali	K_2O, NaO	.5 to 2.50 %	← might be much higher in a clay that expands
	Fe_2O_3	.5 to 6.0 %	
Loss on Ignition	LOI	10 - 20.0 %	- should test prior to chem analysis

Chemical Analysis of fired materials should be nearly the same as raw materials if LOI is done before chem analysis.

Basically the mineralogical testing is more likely to be best in determining whether a material is "CLAY" or not.

Any other questions please call.

J. Beamer