CSIRO LAND AND WATER
www.csiro.au

# XRD Report – Quantitative XRD Analysis of Mt Sylvia Absorbacite 21-10-2013

Mark D Raven and Rodrigo Gomez-Camacho

Report No: D2908
November 2013

Ian Neering

## Citation

Raven, M.D. and Self, P.G. (2013) XRD Report – Quantitative XRD Analysis of Mt Sylvia Absorbacite 21-10-2013. CSIRO, Australia.

## Copyright and disclaimer



## Important disclaimer

## Introduction

One sample of Mt Sylvia Diatomite labelled Absorbacite 21-10-2013 200°C was submitted by Ian Neering for quantitative X-ray diffraction (XRD) analysis.

## Sample Preparation

Approximately 2g of the supplied material was ground for 10 minutes in a McCrone micronizing mill under ethanol. The resulting slurries were oven dried at 60°C then thoroughly mixed in an agate mortar and pestle before being lightly back pressed into stainless steel sample holders for X-ray diffraction analysis.

## X-ray Diffraction Analysis

XRD patterns were recorded with a PANalytical X'Pert Pro Multi-purpose Diffractometer using Fe filtered Co K$\alpha$ radiation, automatic divergence slit, 2° anti-scatter slit and fast X'Celerator Si strip detector. The diffraction patterns were recorded from 3 to 80° in steps of 0.017° 2 theta with a 0.5 second counting time per step for an overall counting time of approximately 35 minutes.

Qualitative analysis was performed on the XRD data using in-house XPLOT and HighScore Plus (from PANalytical) search/match software. Quantitative analysis was performed on the XRD data using the commercial package SIROQUANT from Sietronics Pty Ltd. Amorphous content was determined using tridymite as the amorphous mineral component.

## Results

Quantitative XRD analysis results are shown in Table 1. The composition shows trace smectite (montmorillonite), which is indicated in Figure 1 by the peak at approximately 6.6° 2-theta.

**Table 1. Quantitative XRD analysis (wt.%) of Absorbacite White 15-11-2012 sample.**

| CSIRO ID | Client ID | Quartz % | Cristobalite % | Mullite % | Smectite % | Kaolin % | Albite/ Anorthite % | Amorphous % |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **39385** | **21-10-13 200°C** | 1 | nd | nd | 4 | <1 | nd | 95 |

nd – not detected

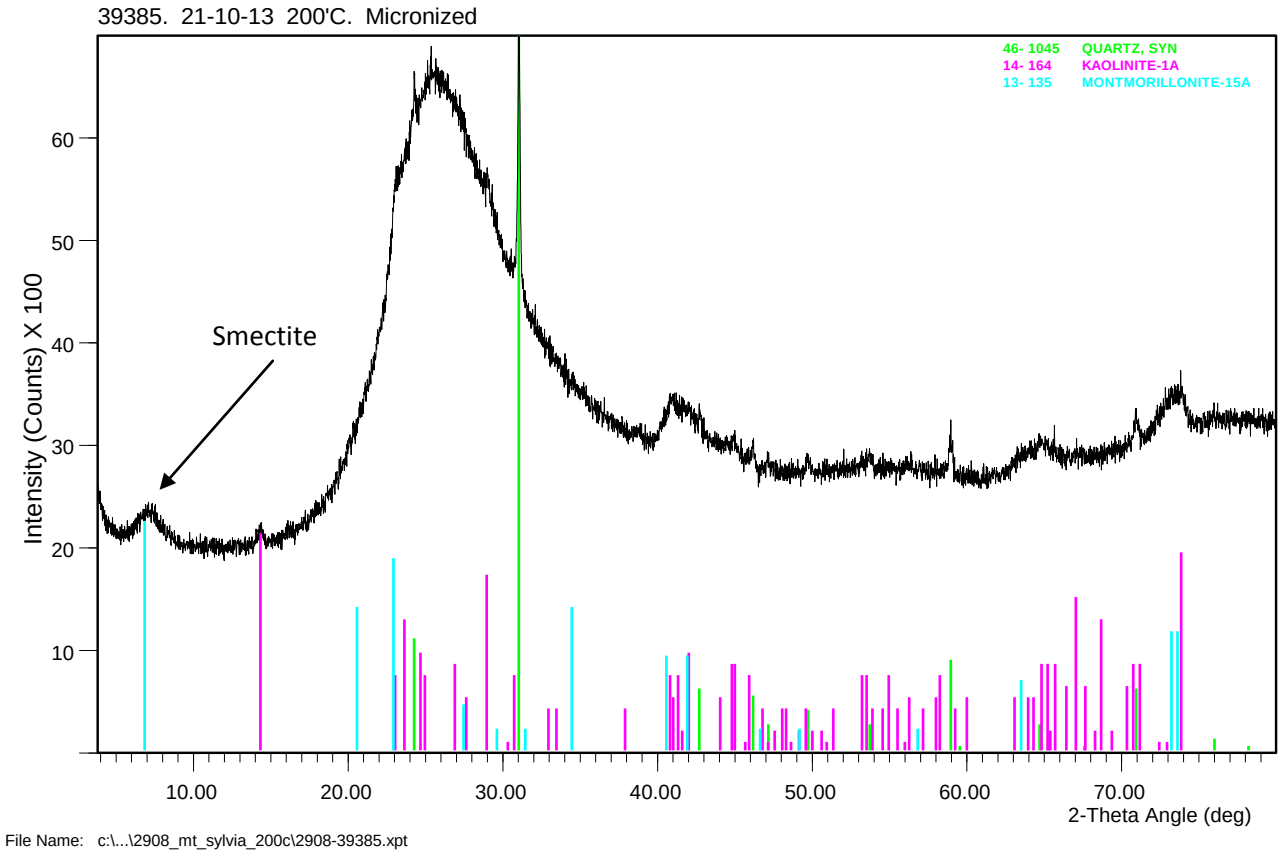


**Figure 1. XRD pattern of Absorbacite 21-10-2013 200°C sample (Co Kα radiation)**

CONTACT US

**t** 1300 363 400
+61 3 9545 2176
**e** enquiries@csiro.au
**w** www.csiro.au

YOUR CSIRO

Australia is founding its future on science and innovation. Its national science agency, CSIRO, is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.

FOR FURTHER INFORMATION

**CSIRO Land and Water**
Mark Raven
**t** +61 8 8303 8497
**e** mark.raven@csiro.au
**w** www.csiro.au