



walter c. mc crone associates, inc.

CONSULTING: ULTRAMICROANALYSIS • MICROSCOPY • SMALL PARTICLE PROBLEMS • SOLID-STATE CHEMISTRY



11 December 1973

Mr. Vernon Zeitz  
Windsor Minerals Inc.  
P.O. Box 680  
Windsor, Vermont 05089

*Two samples  
were done  
with Asbestos  
test efficiency*

Dear Mr. Zeitz:

We have examined two samples of talc identified as 66-US-C and 66-S7-23. These were later identified to us as having originated from the same raw ore but had followed different processing sequences. Sample 66-US-C had been processed using citric acid plus butanol flotation reagent, whilst Sample 66-S7-23 had been processed using your standard flotation reagent identified as Ultrawet DS.

The samples were examined using x-ray diffraction, which has a sensitivity limit of around 1%, and transmission electron microscopy combined with selected area electron diffraction, which has a sensitivity in the parts per million range for asbestiform minerals for which we were specifically requested to look.

Neither sample showed any evidence of asbestiform minerals by x-ray diffraction, indicating that if any were present their levels were below the 1% level. Examination on the transmission electron microscope, however, indicated several fibers and fiber bundles of chrysotile asbestos and we attach some typical photomicrographs showing the morphology of these fibers. The identity of the fibers as chrysotile asbestos was confirmed by selected area electron diffraction and we estimate that the approximate level of chrysotile present was in the range of 0-0.01%. Transmission electron microscopy shows no evidence of asbestiform minerals in Sample 66-US-C.

From these results it is clear that the citric acid plus butanol flotation reagent was significantly better than the Ultrawet DS standard flotation reagent in removing chrysotile asbestos from talc ore bodies.

If you should have any questions concerning this work, please feel free to call us.

*Richard J. Shimps*

Richard J. Shimps  
Research Chemist

IMS/RS:bb  
Ref: MA 3295  
enclosures

Yours sincerely,

*Ian M. Stewart*

Ian M. Stewart  
Manager, Electron Optics Group

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