

FILE NAME: Johnson & Johnson (JAJ)

DATE: 1971 Oct 21

DOC#: JAJ053

DOCUMENT DESCRIPTION: Report - Examination of Talc Samples for Windsor Mineral Company

Report to:

Windsor Mineral Company
Windsor, Vermont 05089

Technical Report MA-2401

EXAMINATION OF TALC SAMPLES

FOR

WINDSOR MINERAL COMPANY

Submitted by:

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21 October 1971

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EXHIBIT

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Summary

Three talc samples, identified as 2676-55A, 2676-55B, and 2676-55C, have been examined for the Windsor Mineral Company with particular emphasis being placed on the fiber content of the materials, particularly fibers of the asbestiform minerals.

Of the three samples, A and C were found to contain several fibers of unknown mineralogical types, none of which yielded electron diffraction patterns which would permit their identification. Several of these fibers appeared morphologically similar to chrysotile, but no positive identification was possible.

Sample C showed the thinnest plates of talc and on this basis is judged to be the best talc of the three samples.

EXAMINATION OF TALC SAMPLES

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Introduction

Three samples of talc, identified as 2676-55A, 2676-55B, and 2676-55C were submitted by the Windsor Mineral Company, Windsor, Vermont, for examination by electron microscopy and electron diffraction techniques. Information was sought on the fiber content of the three samples, in particular the presence of asbestiform mineral fibers. It was further requested that we compare samples A and B with sample C. For this reason, sample C will be described first.

Results of the Examination

Sample 2676-55C

This sample has a very clean appearance with extremely thin plates of talc and very few pieces of rolled talc. In our examination of this sample we observed two fine fibers, neither of which could be positively identified since they did not yield diffraction patterns but one of which did have a morphology similar to chrysotile. It should be pointed out, however, that we observed similar morphology in several minerals. No amphibole particles were observed. The plate-size range in the portion of the sample analyzed in the transmission electron microscope is approximately 1-3 μm .

Sample 2676-55A

In this sample, the talc plates appeared to be thicker, and there is a slightly higher percentage of rolled talc plates. We found four fibers, three of which could be classed as suspect on the basis of their morphology, but none of these fibers could be positively identified. Of the three suspect fibers, one has a limited similarity and two have substantial similarity to the morphology of chrysotile, but they could not be identified as this mineral as we were unable to obtain electron diffraction patterns from them. Again we detected no amphiboles although there is slightly more extraneous material than in sample C.

Sample 2676-55B

This sample appeared very clean, containing no fine fibers of any type, fewer fine talc particles and no amphiboles. There is very little extraneous material present, and only on one occasion did we find any of the normal decomposition products of chlorite or carbonates. The talc plates are not quite as thin as those in sample C but are thinner than those in sample A.

Observations

Despite the presence of the two fine fibers in C, this sample appears to be the best example of talc since it occurs as the thinnest plates. We would place sample B as next best on the basis of plate thickness and sample cleanliness.

The possibility that the suspect fibers found in samples A and B originate from some external source of contamination cannot be precluded.

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The fact that these occurred as isolated fibers would tend to indicate external rather than internal contamination of the source material; internal contamination would, in general, tend to yield fibrous bundles or aggregates, and it is unlikely that isolated fibers of the dimensions which we are observing, approximately 20 nm in diameter, would occur in a natural talc body.