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DATE: 1974 Oct 23

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DOCUMENT DESCRIPTION: Memo RE Diffraction Patterns of Asbestos in Four Talc Samples from RT Vanderbilt with Sample Results

Johns-Manville

Internal Correspon...

To: R. S. Lamar - R&D

Date: October 23, 1974

From: V. E. Wolkodoff - R&D

Copies: Distribution on Reverse Side

Subject: TEM AND SELECTED AREA DIFFRACTION PATTERNS OF ASBESTOS MINERALS IN FOUR TALC SAMPLES PRODUCED BY R. T. VANDERBILT COMPANY

1. At your request, I was able to contract time on the Philips 200 electron microscope at Denver Research Institute to confirm by selected area diffraction patterns, the presence of chrysotile, anthophyllite and tremolite in all the R. T. Vanderbilt talcs designated Nytal 200, Nytal 400, Asbestine 3X, and Asbestine 325X (please refer to my letter of October 9, 1974, which is based basically on FDA optical methods and the use of our RCA electron microscopes to confirm chrysotile). It was felt that selected area diffraction patterns of the asbestos minerals using the Philips 200 would lend positive identification - a type of analysis which cannot be done on our RCA EMU-3B model.

2. Table No. 1 not only identifies samples, but also identifies all TEM prints and selected area diffraction patterns of the 33 prints attached to this letter. The TEM plates are always on file. The microscope constant ($L\lambda$) was derived by averaging 21 microscope constant values based on lines of Au and Pd. The microscope constant is:

$$L\lambda = 4.451\ \text{Å cm} \pm 0.003$$

To calculate d-spacing in Angstrom units, the following formula was used:

$$\frac{L\lambda\ (\text{Å cm})}{\text{spot pair radius (cm)}} = \text{d-spacing (Å)}$$

3. Chrysotile, anthophyllite, and tremolite were all found in each of the four R. T. Vanderbilt talc samples. Particular data for each sample are found in Table No. 1 and appropriate attached electron diffraction patterns.

V. E. Wolkodoff

V. E. Wolkodoff

jc

Attachments

CRMC-HT-TALC-000048

...Form 1164 ... 83-84

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*Prints attached only to those names followed by asterisk.

TABLE 1

TEM Tabulation of Micrographs and Selected Area Diffraction Patterns of Four Talc Samples From R. T. Vanderbilt Co.

No.	Lab. No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
1	RC 74255-1	Nytal 200	2301., 11,000X	-	-
2	RC 74255-1	Nytal 200	2317A, 16,000X	-	-
3	RC 74255-1	Nytal 200	2305A, 22,000X	-	Chrysotile fiber
4	RC 74255-1	Nytal 200		2305B	Pattern is of widest fiber in 2305A, Chrysotile
5	RC 74255-1	Nytal 200	2306A, 22,000X	-	Anthophyllite fiber
6	RC 74255-1	Nytal 200	-	2306B	Anthophyllite fiber in 2306A
7	RC 74255-1	Nytal 200	2307A, 22,000X	-	Tremolite fiber
8	RC 74255-1	Nytal 200	-	2307B	Tremolite fiber in 2307A
9	RC 74255-2	Nytal 400	2302D, 11,000X	-	-
10	RC 74255-2	Nytal 400	2318C, 16,000X	-	-
11	RC 74255-2	Nytal 400	2308A, 22,000X	-	Chrysotile fiber
12	RC 74255-2	Nytal 400	-	2308B	Pattern of Chrysotile above
13	RC 74255-2	Nytal 400	2309A, 22,000X	-	Anthophyllite fiber
14	RC 74255-2	Nytal 400	-	2309B	Pattern of Anthophyllite above
15	RC 74255-2	Nytal 400	2310A, 22,000X	-	Tremolite fiber
16	RC 74255-2	Nytal 400	-	2310B	Pattern of Tremolite above
17	RC 74255-3	Asbestine 3X	2303D, 11,000X	-	-
18	RC 74255-3	Asbestine 3X	2319D, 16,000X	-	-
19	RC 74255-3	Asbestine 3X	2311A, 22,000X	-	Chrysotile fiber on bottom
20	RC 74255-3	Asbestine 3X	-	2311B	Pattern of Chrysotile above
21	RC 74255-3	Asbestine 3X	2312A, 22,000X	-	Anthophyllite fiber
22	RC 74255-3	Asbestine 3X	-	2312B	Pattern of Anthophyllite above
23	RC 74255-3	Asbestine 3X	2313A, 22,000X	-	Tremolite fiber
24	RC 74255-3	Asbestine 3X	-	2313B	Pattern of Tremolite above
25	RC 74255-4	Asbestine 325	2304A, 11,000X	-	-
26	RC 74255-4	Asbestine 325	2322A, 16,000X	-	Fiber is comingled Chrysotile and Amphibole

Table 1 continued

No.	Lab. No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
27	RC 74255-4	Asbestine 325	-	2322B	Chrysotile pattern superimposed on Amphibole pattern
28	RC 74255-4	Asbestine 325	2314A, 22,000X	-	Chrysotile fiber
29	RC 74255-4	Asbestine 325	-	2314B	Pattern of Chrysotile above
30	RC 74255-4	Asbestine 325	2315A, 22,000X	-	Longest fiber is Anthophyllite
31	RC 74255-4	Asbestine 325	-	2315B	Pattern of Anthophyllite above
32	RC 74255-4	Asbestine 325	2316A, 22,000X	-	Largest fiber is Tremolite
33	RC 74255-4	Asbestine 325	-	2316B	Pattern of Tremolite above