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PROPOSED SPECS FOR ANALYZING TALC FOR ASBESTOS

Johnson & Johnson

F

New Brunswick, N.J.
May 16, 1973

Subject:

Dr. F. R. Rolle

I am going to England Friday, May 25. I have been asked to bring along our proposed specs for analyzing talc for "asbestos."

Please get me copies of all reports, correspondence, etc., that are pertinent, plus a cover memo outlining our recommendations.

England is considering method of preconcentrating the asbestos so as to be able to analyze by X-ray. They find no "asbestos" by doing this with Italian talc. They find (Pooley) 0.05% of a tremolite-type in Vermont.

TO

T. H. Shelley

mf
c: Dr. R. A. Fuller
Dr. A. J. Goudie
Dr. W. Nashed
Dr. D. R. Petterson

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Johnson & Johnson

New Brunswick, N.J.
May 22, 1973

Subject: PROPOSED SPECS FOR ANALYZING TALC FOR ASBESTOS

Dr. T. H. Shelley

I. USP

II. Other Methods

Step Scanning X-Ray Diffractometry

Advantages

Disadvantages

Preconcentration of Asbestos (Pooley Method)

Differential Thermal Analysis

Microscopy

Electron Microscopy and Petrology

Dispersion Staining

III. Present Strategy

F. Robert Rolle, Ph.D.

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cc: Dr. A. J. Goudie
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I. USP

We have been working on a preliminary draft with Mr. George Heinze on developing a USP method for the detection of asbestos in talc. Exhibit A is the USP XIX comment proof on X-ray diffraction. Exhibit B is our detailed procedure which has been submitted to Mr. Heinze, for determination of amphibole (such as, tremolite) and serpentine (such as, chrysotile) in talc by scanning X-ray diffractometry. Using this method on Italian Talc used in SHOWER TO SHOWER* Powder, we find a level of detectability of 1% for Tremolite and 5% Chrysotile.

II. Other Methods Which Have Been or Are Under Consideration for the Detection of Asbestos in Talc

Step Scanning X-Ray Diffractometry

Advantages: Level of detectability better than by scanning X-ray diffraction. For example, by this method we can detect 0.1% tremolite and 3% chrysotile in Italian talc (Exhibit C).

Disadvantage: Using the step scanning procedure, it takes one day per sample for analysis vs. a small fraction of a day for the scanning method.

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Preconcentration of Asbestos followed by X-Ray Diffraction Analysis (Pooley Method)

Dr. Pooley has developed two techniques for preconcentration of chrysotile and tremolite in talc followed by X-ray diffraction analysis. For chrysotile (Exhibit D), his level of detectability is 0.05% and when this method is applied to Italian and Vermont talc, no chrysotile is detected. The second technique developed also by Dr. Pooley involves preconcentration of tremolite in talc (different procedure) followed by X-ray diffraction analysis. This technique has not been written up yet, but evidently when applied to Vermont talc, 0.05% of tremolite-type is found. The limitation of this method is that it may be too sensitive.

Differential Thermal Analysis (DTA)

DTA has proven to be a relatively fast and sensitive method (at least 1%) for detection of chrysotile in talc (Exhibit C). The DTA method is not applicable for the detection of tremolite in talc. At our suggestion, the FDA recently purchased a DTA unit, presumably to look into this method for detecting chrysotile.

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Microscopy

A. Electron Microscopy and Petrology

The areas of electron microscopy and optical microscopy (petrology) have been thoroughly evaluated but though, not without merit, they suffer from the following limitations:

a) require a fair degree of expertise
b) in the case of electron microscopy, we are dealing with an expensive instrument that few laboratories have.
c) one is viewing a very small amount of material (µg) under the microscopy and one wonders how representative it is of the bulk material. Multiply sampling and viewing under the microscopy may eliminate this problem, but it results in consumation of a great deal of time.
d) the level of detection really depends upon the amount of time spent with the microscope.
e) quantification by particle counting is very time consuming and normally not done.

B. Dispersion Staining

The dispersion staining method championed by Dr. Walter McCrone looked initially very exciting as a quick, easy method for scanning talc for asbestos. However, it was found (Exhibit E) that certain non-asbestos minerals gave the same dispersion staining characteristics as the asbestos minerals. The method evidently lacks specificity when applied to talc.

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III. Present Strategy

Present plans call for scanning X-ray diffraction for the detection of both amphibole and serpentine asbestos in talc. In the case of chrysotile (serpentine), Differential Thermal Analysis may be a good alternate method since it offers a level of detectability of 1% chrysotile in talc vs. 5% chrysotile in talc by scanning X-ray diffraction.

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