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February 25, 1977

CSMRI Project C10704

Mr. William H. Ashton
Johnson & Johnson
Baby Products Company Research
U.S. Route No. 202
Raritan NJ 08869

Dear Bill:

This letter is a report of the results of our examination of talc samples designated as Experimental Talc Series 3-16-76, Product, Head, and Tail. These samples were examined with the purpose of identifying all minerals present, even those at a level of a few parts per million. The head and tail samples were examined for the purpose of guiding the identification of minerals which might be present in the product at very low levels. The methods of examination and identification were x-ray diffraction (XRD) before and after concentration by heavy liquid separation, handpicking for x-ray diffraction, and electron microprobe analysis.

SUMMARY

X-ray diffraction of the bulk product identified approximately 5% each of magnesite and chlorite, and approximately 2% dolomite. Other than talc, no additional minerals were identified in the untreated bulk product.

Heavy liquid separations at 2.8 specific gravity (plus specific gravities of 3.3 for the tail and 2.68 for the product) followed by XRD of all fractions identified numerous additional minerals as tabulated in Table 1. Electron microprobe analysis identified minerals additional to those listed in Table 1. The total suite of minerals identified in the product are: talc, magnesite, dolomite, chlorite, quartz, pyrite, pyrrhotite, pentlandite, chromite, magnetite, ilmenite, rutile, apatite, and muscovite.

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DETAILS

Heavy liquid separations were run on all samples in order to concentrate those phases present at low levels so that their detection and identification could be readily achieved.

Quartz was identified in the product at a level estimated to be 6-9 ppm. This was achieved by performing a 2.68 specific gravity separation on the sample, x-raying the light fraction, and estimating the amount of quartz present, as follows:

	Wt. (g)	Wt. (%)	x	XRD Estimated Wt % Qtz	=	Wt % Qtz in Original Sample
<2.68 sp. gr.	0.009	0.028		2-3		6-9 ppm

As shown in Table 1, 2.8 specific gravity separations and x-ray diffraction identified large amounts (>1%) of talc magnesite, dolomite, and chlorite. Small amounts (<0.1%) of pyrite, pyrrhotite, pentlandite, and rutile were also identified by this technique.

Electron microprobe examination of a polished grain mount of the >2.8 specific gravity fraction of the product allowed identification of several additional minerals, as follows: chromite, ilmenite, nickeliferous pyrrhotite, apatite, muscovite, and a phase consistent with the composition of anthophyllite. Also identified by microprobe were quartz, pyrite, pyrrhotite, pentlandite, cobalt-bearing pentlandite, and rutile.

Several accicular grains were handpicked from the >2.8 specific gravity fraction of the product, and x-rayed in a Gandolfi camera in an attempt to confirm the presence of anthophyllite. The XRD pattern of these grains showed only talc. Photographs of the five grains x-rayed are attached, and it appears as though they are talc pseudomorphous after amphibole. Amphibole was not conclusively identified in the sample.

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This completes our work on the 3-16-76 experimental series product, head, and tail.

Very truly yours,

Jerry Krause

Jerry Krause
Projects Manager
Mining Division

/cjm

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