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MELLON INSTITUTE OF INDUSTRIAL RESEARCH

DEPARTMENT OF RESEARCH IN CHEMICAL PHYSICS

MELLON INSTITUTE
Reports Division
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Fellow Mr. J. F. Morgan Fellowship No. 259

Project Dust Analysis: Owens-Illinois Glass Company

Project No. 127-X

Date of Report January 4, 1950

NATURE OF REPORT: Preliminary ____ Progress ____ Final XXXX

Sample No. 873 < 5 μ (Film P976).

The diffraction pattern is of fair quality but somewhat faint, indicating the sample to contain an appreciable non-crystalline fraction. The major crystalline component is β-$CaO \cdot SiO_2$ and there is a minor amount of $CaCO_3$. Quartz is not detected and, if present, must not constitute more than about 2% of the sample.

A number of lines remain unexplained, two of considerable strength. They are not due to chrysotile asbestos nor to other varieties of asbestos for which data are immediately available. However, the diffraction data on asbestos are not highly reliable or complete. Furthermore, the asbestos minerals give poor quality powder diffraction patterns and are not readily identifiable by x-ray diffraction means alone.

Sample No. 873 > 5 μ (Film P997).

The pattern is the same as the above except that the lines of quartz appear. Spectrometer analysis shows the quartz content to be 16%. The spottiness of the quartz lines shows that a considerable fraction of it is rather coarse, mean particulate dimension perhaps 50-100 microns. As in the < 5 μ fraction, the major constituent is β-$CaO \cdot SiO_2$ and a minor amount of $CaCO_3$ is present.

Patterns of Raw Materials:

Asbestos (Film P981) -- The pattern observed is due almost entirely to quartz, which constitutes about 10-15% of the material. Only three lines of appreciable strength remain, and they do not check the available asbestos data.

Kenite (Film P982) -- The material is largely amorphous. It gives a faint clay-like pattern which is too diffuse in nature to be observed in a mixture with the patterns of other materials, as in Sample 873.

Clay (Film P983) -- The material is predominantly kaolinite and gives a good diffraction pattern. It should be possible to detect it in concentrations down to about 10%, but it was not observed in Sample 873.

Leroy E. Alexander

SENIOR FELLOW

Leroy E. Alexander:mlc
T: 1-4-50

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