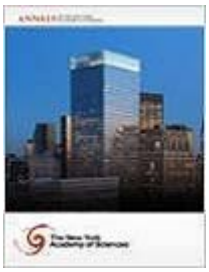
INFLUENCE OF CRYSTALLIZATION HABIT OF MINERALS ON IN VITRO CYTOTOXICITY†

1. Lalita D. Palekar[1],
2. Charles M. Spooner[2],
3. David L. Coffin[3]

Article first published online: 16 DEC 2006

DOI: 10.1111/j.1749-6632.1979.tb18771.x

Issue



Annals of the New York Academy of Sciences

Volume 330, Health Hazards of Asbestos Exposure (/doi/10.1111/nyas.1979.330.issue-1/issuetoc) pages 673–686, December 1979

Additional Information

How to Cite

Palekar, L. D., Spooner, C. M. and Coffin, D. L. (1979), INFLUENCE OF CRYSTALLIZATION HABIT OF MINERALS ON IN VITRO CYTOTOXICITY. Annals of the New York Academy of Sciences, 330: 673–686. doi: 10.1111/j.1749-6632.1979.tb18771.x

Author Information

[1] Northrop Services, Inc. Environmental Sciences Group Research Triangle Park, North Carolina 27709

[2] GCA Technology Bedford, Massachusetts 01730

[3] Environmental Protection Agency Research Triangle Park, North Carolina 27711

† This report presents the results of work performed by Northrop Services, Inc. (under Contract Number 68-02-2566) and GCA Technology (under Contract Number 68-02-2771) for the United States Environmental Protection Agency.

Publication History

1. Issue published online: 16 DEC 2006
2. Article first published online: 16 DEC 2006

Get PDF (552K) (/doi/10.1111/j.1749-6632.1979.tb18771.x/pdf)

First page of article

INFLUENCE OF CRYSTALLIZATION HABIT OF MINERALS ON *IN VITRO* CYTOTOXICITY*

Lalita D. Palekar,† Charles M. Spooner,‡ and David L. Coffin§

†*Northrop Services, Inc.*
Environmental Sciences Group
Research Triangle Park, North Carolina 27709

‡*GCA Technology*
Bedford, Massachusetts 01730

§*Environmental Protection Agency*
Research Triangle Park, North Carolina 27711

The health hazards caused by exposure to commercial asbestos particles are well known. The question, however, still remains whether the nonasbestiform equivalents of these minerals to which people may be exposed in mining, quarrying, and other activities can also have adverse effects on human health. Identification of minerals in various crystallization habits and their interactions with biological systems is pertinent. Unfortunately, direct study of the physical, chemical, and biological properties of all minerals and their varieties would be an extremely expensive and time-consuming project. A more practical approach is to define the physical and chemical properties of minerals and their varieties in different categories and test them simultaneously in selected biological systems. It is conceivable that extrapolations can be made to relate specific mineralogical properties to specific biological activities.

Several attempts have been made by other investigators to relate physical and/or chemical properties of minerals with biological properties. While some studies revealed that hemolysis of mammalian erythrocyte is related to mineral surface area,[1,2] others have shown that it depends on surface charge,[3,4] and yet others have indicated a relationship to magnesium content.[2,5,6] In an earlier study, we demonstrated that still another mineral characteristic—namely, asbestiform crystallization habit is responsible for sheep erythrocyte hemolysis and rabbit alveolar macrophage cytotoxicity.[7]

The study is designed in an attempt to define the roles of physical and chemical characteristics in the biological system. Four samples of cummingtonite-grunerite series in different crystallization habits are selected. In preparation for biological studies, these minerals are ground to obtain samples of various particle sizes. All samples are characterized for chemical composition, size distribution, and surface charge. Biological activity of the samples is assessed in terms of cell lysis of sheep erythrocytes and cytotoxicity to Chinese hamster ovary cells.

*This report presents the results of work performed by Northrop Services, Inc. (under Contract Number 68-02-2566) and GCA Technology (under Contract Number 68-02-2771) for the United States Environmental Protection Agency.

0077 8923/79/0330–0673 $1.75/0

Get PDF (552K) (/doi/10.1111/j.1749-6632.1979.tb18771.x/pdf)

More content like this

Find more content:

- like this article (/advanced/search/results?articleDoi=10.1111/j.1749-6632.1979.tb18771.x&scope=allContent&start=1&resultsPerPage=20)

Find more content written by:

- Lalita D. Palekar (/advanced/search/results?searchRowCriteria[0].queryString="Lalita D. Palekar"&searchRowCriteria[0].fieldName=author&start=1&resultsPerPage=20)
- Charles M. Spooner (/advanced/search/results?searchRowCriteria[0].queryString="Charles M. Spooner"&searchRowCriteria[0].fieldName=author&start=1&resultsPerPage=20)
- David L. Coffin (/advanced/search/results?searchRowCriteria[0].queryString="David L. Coffin"&searchRowCriteria[0].fieldName=author&start=1&resultsPerPage=20)
- All Authors (/advanced/search/results?searchRowCriteria[0].queryString="Lalita D. Palekar" "Charles M. Spooner" "David L. Coffin"&searchRowCriteria[0].fieldName=author&start=1&resultsPerPage=20)