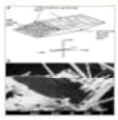

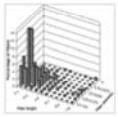

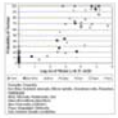

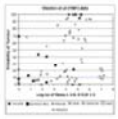

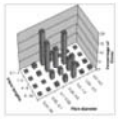

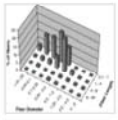

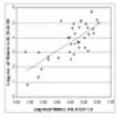

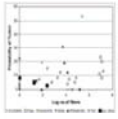

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Regulatory Toxicology and Pharmacology

Volume 52, Issue 1, Supplement, October 2008, Pages S187–S199

International Symposium on the Health Hazard Evaluation of Fibrous Particles Associated with Taconite and the Adjacent Duluth Complex — Taconite Symposium

A review of carcinogenicity studies of asbestos and non-asbestos tremolite and other amphiboles

John Addison[a], Ernest E. McConnell[b]

[a] John Addison Consultancy Ltd., Cottingham, Yorkshire HU16 4NL, UK

[b] ToxPath, Inc., 3028 Ethan Lane, Raleigh, NC 27613, USA

http://dx.doi.org/10.1016/j.yrtph.2007.10.001, How to Cite or Link Using DOI

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Abstract

Experimental animal studies comparing asbestos and non-asbestos varieties of tremolite indicate tremolite asbestos is markedly more carcinogenic. By direct analogy, the differences in carcinogenicity between tremolite asbestos and non-asbestos prismatic tremolite should be the same for the other types of amphibole that also crystallize in the asbestos and non-asbestos habits. The earliest of the experiment animal studies, done more than 25 years ago, have design limitations by modern standards including the use of injection or surgical implantation as the route of administration rather than the more relevant route of inhalation. However, the differences in the carcinogenicity of amphibole asbestos and non-asbestos amphiboles are sufficiently large to be clearly discernable even with the study limitations. Together with later studies on these and related minerals, there is strong evidence of a much lower hazard associated with the shorter, thicker fibers of the non-asbestos amphiboles, than is found for the asbestos analogues of the same mineral. It is possible that the non-asbestos amphiboles are no more hazardous than other silicate minerals widely considered nuisance dusts.

Keywords

Amphibole; Asbestos; Tremolite; Carcinogenic

Figures and tables from this article: