



WORLD HEALTH ORGANIZATION
INTERNATIONAL AGENCY FOR RESEARCH ON CANCER

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans

Volume 42 Silica and Some Silicates

Summary of Data Reported and Evaluation

[Talc](#)

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TALC

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5. Summary of Data Reported and Evaluation

5.1 Exposure data

Talc occurs in various geological settings around the world but is usually formed by alteration of ultramafic rocks or dolomites. Talc deposits may contain various other minerals, including carbonates, free silica and serpentines (including chrysotile) and amphibole minerals (asbestiform and nonasbestiform). Occupational exposures occur during mining, milling, processing and in a wide variety of secondary industries (e.g., ceramics, paper, rubber and paint production). Exposure of the general population occurs through use of products such as cosmetics.

5.2 Experimental data

Talc of different grades was tested for carcinogenicity in mice by subcutaneous, intraperitoneal and intrathoracic injection, in rats by oral administration, inhalation exposure and intraperitoneal, intrathoracic and intrapleural injection, and in hamsters by inhalation exposure and intratracheal instillation. The majority of these studies were inadequate. Tumour incidence was not increased following either the administration of single doses of various talcs to rats by intrapleural administration or administration of talc by four intraperitoneal injections. A single subcutaneous injection of talc in mice did not produce local tumours. No tumour was produced by administration of talc in the diet of rats. In most of the above studies, characterization of the talc was insufficient to determine whether it contained asbestiform fibres.

No teratogenic effect was observed in rats, mice, hamsters or rabbits following oral administration of talc.

Talc was not mutagenic to *Salmonella typhimurium* or *Saccharomyces cerevisiae*. It did not induce chromosomal aberrations in cultured human cells or in rats *in vivo* or dominant lethal mutations in rats.

5.3 Human data

Case reports have suggested an association between exposure to talc containing asbestiform fibres and mesothelioma.

Proportionate mortality studies of miners and millers of talc containing asbestiform tremolite and anthophyllite showed an excess of lung cancer and one case of mesothelioma. A cohort study of workers in one company revealed significant excess mortality from lung cancer and from nonmalignant respiratory disease. Mortality from lung cancer increased with latency.

In several mortality studies, cancer risk was assessed among miners and millers of talc that was reported to contain no more than trace amounts of asbestiform minerals. A cohort mortality study of talc miners and millers showed an excess of lung cancer in underground miners but not in millers; a contributory etiological role of radon daughters to the lung cancer risk in miners could not be excluded. Three other studies suffered from methodological limitations and could not be interpreted.

A case-control study suggested an approximate doubling of the risk for ovarian cancer among women after perineal use of talc.

4.4 Evaluation

There is *inadequate evidence* for the carcinogenicity of talc to experimental animals.

There is *inadequate evidence* for the carcinogenicity to humans of talc not containing asbestiform fibres, while there is *sufficient evidence* for the carcinogenicity to humans of talc containing asbestiform fibres.

For definition of the italicized terms, see [Preamble Evaluation](#).

Subsequent evaluation: [Suppl. 7 \(1987\)](#)

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ERIONITE

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5. Summary of Data Reported and Evaluation

5.1 Exposure data

Erionite occurs as a fibrous component of some zeolite deposits in various areas of the world. Erionite fibres have also been identified as a component of soil and building materials in these areas. The most important exposures to date have been nonoccupational and occur as a result of resuspension of erionite-containing dusts. Occupational exposures occur during mining, milling and processing of some zeolites as well as during agricultural work in areas in which soils are contaminated with erionite.

5.2 Experimental data

Erionite from various natural sources was tested for carcinogenicity in rats by inhalation and by intrapleural administration, and in mice by intraperitoneal injection, producing high incidences of mesotheliomas by all routes of administration.

No data were available to evaluate the reproductive or prenatal toxicity of erionite in experimental animals.

Erionite induced unscheduled DNA synthesis and morphological transformation in cultured mammalian cells.

5.3 Human data

Descriptive studies have demonstrated very high mortality from malignant mesothelioma, mainly of the pleura, in three Turkish villages where there was contamination from erionite and where exposure was from birth. Erionite fibres were identified in lung tissue samples in cases of pleural mesothelioma; ferruginous bodies were found in a much higher proportion of inhabitants in contaminated villages than in those of two control villages.

5.4 Evaluation

There is *sufficient evidence* for the carcinogenicity of erionite to experimental animals.

There is *sufficient evidence* for the carcinogenicity of erionite to humans.

For definition of the italicized terms, see [Preamble Evaluation](#).

Subsequent evaluation: [Suppl. 7 \(1987\)](#)