Rock Wool

Rock wool, sometimes called stone wool, is a type of synthetic vitreous fiber. Rock wool is used primarily for thermal and acoustical insulation, typically in buildings, vehicles and appliances. Consumers are likely to come into contact with rock wool in the process of installing insulation in their homes, or from insulation that has already been installed.

Rock wool passed the human and animal data screens, underwent a preliminary toxicological evaluation, and is being brought to the Carcinogen Identification Committee for consultation. This is a compilation of the relevant studies identified during the preliminary toxicological evaluation.

Epidemiological data

- Occupational cohort studies
  - Male workers employed in six rock wool plants: Marsh *et al.* (1990), as reviewed in IARC (2002)
  - Male and female workers employed in five rock wool plants: Marsh *et al*. (1996), as reviewed in IARC (2002)
  - Follow-up study of male workers from one plant studied in Marsh (1990): Marsh *et al*. (1996), as reviewed in IARC (2002)
  - Male and female workers employed in two plants in Sweden: Plato *et al.* (1995), as reviewed in IARC (2002)
  - Male and female workers employed in seven plants in Europe: Boffetta *et al*. (1997), as reviewed in IARC (2002)
  - Male workers employed in seven plants in Europe: Consonni *et al.* (1998), as reviewed in IARC (2002)
  - Male and female workers in European plants: Boffetta *et al*. (1999), as reviewed in IARC (2002)

- Occupational case-control studies
  - Nested case-control study of male workers from six rock wool plants: Marsh *et al.* (1996), as reviewed in IARC (2002)
  - Nested case-control study of 55 male workers who died from lung cancer: Wong *et al.* (1991), as reviewed in IARC (2002)
  - Male workers with lung cancer in seven plants: Kjaerheim *et al.* (2002), as reviewed in IARC (2002)

Animal carcinogenicity data

- Long-term inhalation studies in rats
    - Male and female Wistar rats exposed to rock wool (respirable particles) for two years, and observed for an additional four months: Le Bouffant *et al*. (1984), as reviewed in IARC (2002)
    - SPF Fischer rats exposed to rock wool dust for 12 months, and observed for life: Wagner *et al*. (1984), as reviewed in IARC (2002)
    - Male Fischer 344 rats exposed by nose-only to rock wool (MMVF21) for two years, and observed for an additional four months: McConnell *et al*. (1994), as reviewed in IARC (2002)

- Intratracheal installation study in rats
    - Female Wistar rats exposed to rock wool (10 or 20 weekly doses, and observed for 131 weeks): Pott *et al.* (1994), as reviewed in IARC (2002)

- Intraperitoneal injection studies in rats
    - Female Sprague-Dawley rats injected with rock wool (one or three weekly doses, and observed for life): Pott *et al*. (1987), as reviewed in IARC (2002)
    - Female Wistar rats injected with basalt wool (five weekly doses, and observed for life): Pott *et al*. (1989), as reviewed in IARC (2002)
    - Male and female Sprague-Dawley rats injected with rock wool (once and observed for two years): Maltoni and Minardi (1989), as reviewed in IARC (2002)
    - Rats injected with basalt dust (two monthly doses, and observed for life): Nikitina *et al.* (1989), as reviewed in IARC (2002)
    - Female Wistar rats injected with basalt wool (one or five weekly doses, and observed for life): Pott *et al*. (1991), as reviewed in IARC (2002)
    - Female Wistar rats injected with rock wool (MMVF21: two or five weekly doses or R-stone E3: four or nine weekly doses, and observed up to 130 weeks after the first dose): Pott *et al.* (1993), Davis *et al*. (1996b), Roller *et al.* (1996), as reviewed in IARC (2002)
    - Wistar rats injected with rock wool (males M-stone: one or two doses or females experimental rock wool B-20-2.0: one or two doses, and observed for up to 130 weeks): Pott *et al.* (1993), Davis *et al*. (1996b), Roller *et al.* (1996), as reviewed in IARC (2002)
    - Female Wistar rats injected with experimental rock wool B-20-0.6: one or three weekly injections): Pott *et al.* (1993), Davis *et al*. (1996b), Roller *et al.* (1996), as reviewed in IARC (2002)
    - Male Wistar rats injected with MMVF21 (two doses, observed for life): Miller *et al.* (1999), as reviewed in IARC (2002)

- Intrapleural injection study in rats
    - Sprague-Dawley rats injected with rock wool (once, observed for life): Wagner *et al* (1984), as reviewed in IARC (2002)

- Intratracheal installation study in hamsters
    - Female Syrian hamsters exposed to rock wool (five weekly doses, observed for two years): Adachi *et al.* (1991), as reviewed by IARC (2002)

Other relevant data

- Genotoxicity
    - Review: IARC (2002, pp. 314-321)

- Mode of action considerations
    - Review of mode of action for man-made fibers: IARC (2002, pp. 334-337); Moolgavkar *et al*. (2000)

- Structure activity considerations
    - Two other types of synthetic vitreous fibers (i.e., glass wool and ceramic fibers) are Proposition 65 carcinogens.
    - Rock wool differs from glass wool and ceramic fibers in the origin of the raw materials from which it is manufactured and somewhat in the chemical composition of the finished fibers. Rock wool is very similar to glass wool and ceramic fibers in size and shape.

References[1]

International Agency for Research on Cancer (IARC, 2002). *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Man-made Vitreous Fibers.* Volume 81 Pp 154-168, 204-223, 314-339, IARC, Lyon, France.

Moolgavkar SH, Luebeck EG, Turim J and Brown RC (2000). Lung cancer risk associated with exposure to man-made fibers. *Drug Chem Toxicol* **23**(1):223-242.

[1] Copies of these listed references, as either the abstract, the relevant sections of the publication, or the complete publication, have been provided to members of the Carcinogen Identification Committee. These references have been provided in the order in which they are discussed in this document.