

The evaluation of the biopersistence, pathological response and pleural translocation of chrysotile containing brake dust in comparison to crocidolite asbestos following short-term inhalation exposure.

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Background: Chrysotile asbestos has been used in the manufacturing of friction brake linings since the early 1900's. Although the use of asbestos containing products is has been reduced, chrysotile brakes continue to be manufactured and/or used in many parts of the world. This is the first inhalation study designed to provide an understanding of the biokinetics and potential toxicology in the lung and pleura of chrysotile containing brake dust following short term exposure in rats. The deposition, pathological response and translocation of brake-dust derived from brake pads manufactured with chrysotile were evaluated in comparison to the amphibole, crocidolite asbestos. This presentation presents results from the lung and in particular the quantification of measurements of fibers and pathological response in the pleural cavity. Methods: Rats were exposed by inhalation 6 h/day for 5 days to either brake-dust obtained by sanding of brake-drums manufactured with chrysotile, a mixture of chrysotile and the brake-dust or crocidolite asbestos. Results: The crocidolite asbestos fibers initiated a rapid inflammatory response in the lung following exposure resulting in a 5-fold increase in fibrotic response within 91 days. In addition, marked increase in visceral pleural thickness and pleural collagen deposition was observed following crocidolite asbestos inhalation. No significant pathological response was observed in the lung or the pleural cavity at any time point in either the brake-dust or chrysotile/brake-dust exposure groups. Conclusions: These results provide support that brake-dust derived from chrysotile containing brake drums would not initiate a pathological response in the lung following short term inhalation.