Content Analysis of Asbestos Dust from Motor Brake Pads in Thailand

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Abstract

Objective: asbestos and crystalline free silica (SiO_2) are the property of Group 1 in IARC carcinogenic substances, particularly the disease association between asbestos and malignant mesothelioma. If the brake pads contain asbestos, fine dust will produce due to the friction by the brake pads and fly into the air by breathing into the lungs and may increase the incidence of lung cancer. Therefore, for this study, analysis was carried out after collecting dust from car brake. Methods: We made dust homogeneous to 100 mesh before using qualitative analysis with Shimadzu XRD-6000. After formic acid pretreatment, the samples were filtered by 25mm T60A20 fiber filter, and made use of zinc plates, the base standard method, for quantitative analysis of absorption correction. Results: Zinc plate diffraction angle CV = 0.39% (n = 7), Chrysotile, Amosite, Crocidolite and three 5-point calibration curves of the concentration of 0.11-5.21mg, r correlation coefficient was more than 0.995.A total of 19 samples were from seven maintenance plants of 12 vehicles. After qualitative analysis we found there were 84.2% SiO_2, 36.8% Chrysotile, 15.8% Amosite, 21.1%Crocidolite, 63.2% Brucite, S52.6%epiolite, 31.6% Anthophyllite, and Tremolite accounted for 5.3%, and so on. After formic acid treatment, Chrysotile accounted for 31.6% and its concentration in dust was 0.8-1.98%.Conclusion: The samples in this study were mainly from Thailand. The results showed that asbestos was actually still in use; many products contain ingredients of Brucite and Sepiolite. We guess most of the asbestos in Thailand should be imported from mainland China. The main reason for asbestos use is the low cost and practical, but people will pay for their health.

Keyword: brake pads, XRD, asbestos