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Measurement of PAHs in carbon black used in Iranian tyre manufacturing plants

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*Abstract

Background: There are thousands of workers in Iran exposed to carbon black used in tyre manufacturing plants, regularly. This compound has been shown to be carcinogenic as there are several PAHs contaminating the carbon black.

Objective: To measure PAHs in carbon black used in Iran industries and also comparing the imported carbon black with domestic ones marked as A & B, respectively.

Methods: Through a cross-sectional study, samples from different kinds of carbon blacks (imported and domestic ones) were obtained. PAH extraction from these samples was carried out using micro Soxhlet. Six different kinds of PAHs including benzo (a) pyrene, dibenzo (a, h) anthracen, phenaterene, fluoranthene, chrysene and anthracene were further analyzed by GC-FID method.

Finding: Both imported and domestic types of carbon blacks were contaminated with all six kinds of PAHs, unexceptionally. However, the total concentration of six PAHs was different among study samples ($P < 0.001$). Chrysene and anthracene showed to have the maximum and the minimum concentration, respectively. The highest contamination of carbon blacks was associated with product manufactured by factory A followed by factory B with lowest contamination.

Conclusion: The data obtained from the present research showed that both types of carbon blacks used in this study were contaminated with PAHs. Comparing our results with some other studies was indicative of presence of a higher contamination in this soot. Therefore, Iranian occupational health system is recommended to place the carbon blacks in carcinogenic class and provide new OEL for working places.

Keywords: Polycyclic Hydrocarbons, Carbon Black, Neoplasms

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(PAHs)

A) :

PAHs (B

GC-FID (a,h) PAHs (a)

PAHs PAHs :

(p< /)

B A

PAHs

(OEL)

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