

## Risk assessment of chemical pollutants in an automobile manufacturing

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### Abstract

**Introduction:** In recent years, many national and international expert groups have considered specific improvements in risk assessment of chemical pollutants. This study considered to assess the risk of workers exposure to air pollutants in an automobile manufacturing in order to evaluate the health risk assessment due to the inhalation exposure.

**Material and Method:** To perform this study, a cross-sectional research was done in 2016. Methods number 1501 and 7602 of the National Institute of occupational safety and Health (NIOSH) were used for sampling and analysis of compounds BTEX and silica in the air. A total of 40 samples of compound BTEX were taken and analyzed by Gas Chromatography-Flame Ionization Detector (GC-FID). A total of 6 samples of silica were collected during the campaign. Silica analyses were performed by using visible spectrophotometry. Risk ranking was calculated using the hazard and exposure rate. Finally, the relative risk of blood cancer caused by exposure to benzene was estimated.

**Result:** The result demonstrated that, workers were exposed to 5 chemicals including silica, benzene, toluene, ethyl-benzene, and xylene during their work in manufactory. Among the pollutants in the breathing zone of workers, Silica and benzene were hazardous chemicals at high risk level. Following the estimation of relative risk of blood cancer caused by exposure to benzene, workers cumulative exposure to benzene was obtained to be 23.1 ppm per year and the capture relative risk was 1.1. The consequence demonstrated that, significant relationships were seen between workers exposure to benzene and both age and work experience, so that degree of exposure decreased steadily with increasing age and experience ( $P < 0.001$ ).

**Conclusion:** This research demonstrated that, benzene and silica in the automobile manufacturing were the highest risk. Also, painting hall workers, at automobile manufacturing, were directly exposed to the blood cancer risk of benzene.

**Key words:** Health Risk Assessment, Silica, Compound BTEX, Automobile Manufacturing

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