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## HUMAN HEALTH RISK ASSESSMENT OF ARSENIC IN AIR, SOIL AND WATER IN AN INDUSTRIAL COMPLEX IN KOREA

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### Abstract

Many industrial complexes in Korea have produced a variety of potential toxic chemicals during manufacturing processes and activities by air emissions, effluents, or solid wastes over the past few decades. In this study, arsenic levels in air, soil, and water near an industrial complex were determined. Human health risk assessment for arsenic was conducted based on the levels and potential exposure pathways in a multimedia environment (air, soil, and water). The point estimate of incremental cancer risks in an individual lifetime was  $1.73 \times 10^{-5}$ , which exceeds the Korean recommended guideline for cancer risk ( $1 \times 10^{-6}$ ). Meanwhile, the non-carcinogenic risk from arsenic exposure for the population living in the surroundings of the industrial complex was found to be Hazard Index 0.009, which is much below the acceptable risk level (Hazard Index 1.0). According to the risk levels estimated by means of deterministic and probabilistic methods, arsenic may pose an additional cancer risk to people living near the industrial complex via air inhalation, soil ingestion, and dermal contact.

**Keywords:** arsenic, cancer risk, non-carcinogenic risk, probabilistic risk assessment, risk assessment

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