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## HEALTH RISK ASSESSMENT OF HEAVY METALS AND POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL AT COKE OVEN GAS PLANTS

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### Abstract

Sites contaminated with hazardous materials pose serious risks to human health and ecological environments. Quantitative health risk assessment is a site-specific complex procedure requiring evaluation of all possible pathways. Several studies have focused on the evaluation of heavy metals or organic pollutants; however, only few studies focused on the evaluation of diverse pollutants such as heavy metals and organics. In this study, the health risk of heavy metals and organic pollutants in the soils near coke oven gas plants, China, was assessed according to three human exposure pathways (peroral intake soil, skin exposure to soil, inhale soil.). The carcinogenic and noncarcinogenic risk values of the heavy metals and organic pollutants in each grid (divided into three zones and 60 grids) and grid layer (divided into three layers and 128 samples) were calculated. The total carcinogenic and noncarcinogenic risk values were calculated cumulatively as per the grid and grid layer. The grid area and the volume of contaminated soil corresponding to various risk factors were calculated. The results of the health risk assessment show that 49 out of the 60 grids have a carcinogenic risk factor  $>10^{-5}$  with a total area of 103,340 m<sup>2</sup>. This site has extremely high health risk if  $10^{-5}$  is regarded as the assessment standard for causing cancer. These results show that coke oven gas plants can pose serious risk to human health, and carcinogenic effects should cause more attention.

*Key words:* carcinogenic risk assessment, contaminated site, noncarcinogenic risk assessment, organic contaminant, soil

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