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ABSTRACT

Characterization and health risk assessment of exposure to odorous pollutants emitted from the organophosphorus pesticide field

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Summary

Odor pollution for pesticide contaminated site has been paied close attention, leading to odor nuisance and health risk impact for nearby people. This work confirmed degree and scope of pollution for seven functional area of the organophosphorus pesticide sit in Jiangsu Province, using sensory analysis and atmospheric diffusion model. In addition, the work researched the main characteristics of near soil environment air and soil. Moreover, the work gave specific substances by odor activity value, and analyzed carcinogenic risk and non-carcinogenic risk for 30 compounds. The results showed that: (1) the odor concentration range of each functional area were 309~72443, and the maximum influence of production area and dangerous goods storage area were 3.2 km and 1.7 km, respectively; (2) the 209 and 246 sorts of VOCs and odor substances for environment air and soil were identified, mainly including aromatic compounds such as benzene and xylene, halogen compounds such as chlorobenzene, dichlorobenzene, chloroform, carbon tetrachloride, organic sulfides such as dimethyl disulfide and dimethyl trisulfide and alkene such as 1,1,3-trimethylcyclohexane; (3) it were important odorants for the site that Hydrogen sulfide, methyl mercaptan, dimethyl disulfide, dimethyl trisulfide, acetaldehyde, isovaleraldehyde, hexanal, tetrahydrofuran, phenol, ethylbenzene, m-xylene, p-xylene, isopropyl benzene, chlorobenzene, 1,4-dichlorobenzene, etc; (4) the carcinogenic risk for 22 points ranged from 1.18×10^{-6} to 7.61×10^{-2}, expressed as life cancer risk (LCR). The intermediate synthesis area, dangerous goods warehouse area and sewage treatment area had the highest carcinogenic risk. The non-carcinogenic risk levels ranged from 0.01 to 38.93, expressed as hazard index (HI). The total HI of production area, dangerous goods warehouse area, intermediate synthesis area, storage area and sewage treatment area has certain non-carcinogenic health risk. The studies have shown that the site was prone to odor pollution during the restoration process and there are certain health risks.

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Indicate topic of your work for the conference:

- ☐ Policy and associated regulations for odour and air quality.
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- ☐ Source characterization and odour/VOC mapping.
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