Heavy Metals and PAHs in Sewage Sludge from Twelve Wastewater Treatment Plants in Zhejiang Province[1]

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Objective To investigate the heavy metals (HMs) and polycyclic aromatic hydrocarbons (PAHs) in sludge of twelve wastewater treatment plants (WWTPs) in Zhejiang province of China, and to assess their potential for land application. **Methods** Sludge was collected from 12 WWTPs within the province. GC-MS and AAS were used to measure PAHs and HMs contents in sludge. **Results** Concentrations of HMs in most of the sludge samples were below the regulatory limits for the sludge to be used in agriculture in China with the exception of Zn in 2 sludge samples and Cd in 1 sample. All 16 PAHs, targeted by the USEPA agency, were found in the sludge from the twelve plants with a total concentration ranging from 33.73 mg kg^{-1} to 82.58 mg kg^{-1} (dry weight, d.w.). The levels of ∑9 PAHs varied from 13.87 mg kg^{-1} to 61.86 mg kg^{-1} (d.w.) in the sludge, far exceeding the limitation value recommended by the Europe Union. The concentration and composition of PAHs in sewage sludge varied and depended mainly on the quantity and type of industrial wastewater accepted by the WWTPs. A significant relationship between the proportion of industrial wastewater received by WWTPs and the total content of 16 PAHs in the sludge was observed. **Conclusion** PAHs have become one of the primary pollutants in sludge of Zhejiang WWTPs instead of HMs. It is, therefore, essential to reduce the contents of PAHs before the sludge can be used in agriculture through proper treatment.

Key words: Sludge; Heavy Metal; Chemical Fractions; Polycyclic aromatic hydrocarbons; Contribution

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