



## Fate of Specific Organic Contaminants and Heavy Metals in Wastewater Treatment Plants and River Sediments around Industrial Park

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### Editorial

The wastewater from manufactures in industrial park was enforced to discharge into wastewater treatment plants. Conventionally, the approval to give permission for discharge is based on biological oxygen demand (BOD), chemical oxygen demand (COD) and suspended solids (SS) of discharging wastewater characteristics from manufacturing. Some specific organic and inorganic contaminants were not restricted from the wastewater discharge. Therefore, the specific compounds would be accumulated in the sludge zone of treatment processes in wastewater treatment plants and river sediments in receiving waters. Those contaminants from specific organics and heavy metals would have a great impact on the environment around industrial park. In this study, one of textile manufactures in Da-Yuan and Kuan-Yin Industrial Park, respectively, was chosen as the representative manufacturing factory for specific organic and inorganic contaminants analysis from its waste sludge. Moreover, one of integrated circuits manufactures in Hsin-Chu Science Park was also chosen as a representative manufacturing factory. To trace the specific pollutants from the representative factory, the sludge in the unit processes of wastewater treatment plant and sediment in receiving waters were also sampled and analyzed. The FT-IR and GC/MS was simultaneously applied to identify and analyze semi-volatile organics and volatile organics. Moreover, The ICP/MS was

used to identify and analyze heavy metals. Most of specific organic compounds were benzenic, phenolic and aliphatic derivatives. The compounds for quantitative measurement included nonylphenol, 2,4 bis(1,1 dimethylpropyl)-phenol, 1,1,3,3 tetramethylbutyl-phenol and 1-Tridecene. The nonylphenol concentration in the wastewater treatment plant of Da-Yuan industrial park was 14800 mg/kg, 195.56 mg/kg and 102.04 mg/kg total solids, respectively, in primary sedimentation, activated sludge unit and clarifier. This result shows that the removal efficiency of nonylphenol was significant in the wastewater treatment process. The main distributions of higher concentration of heavy metals in three industrial parks were Copper (Cu), Zinc (Zn) and Manganese (Mn). The lower concentration of heavy metals included Chromium (Cr), Nickel (Ni), Cobalt (Co) and Silver (Ag). Selected heavy metals for quantitative analysis included Chromium (Cr), Cobalt (Co), Nickel (Ni), Molybdenum (Mo), Silver (Ag), Indium (In), tungsten (W), Cadmium (Cd) and Gallium (Ga). The results of quantitative analysis indicated that chromium was the major heavy metal pollutant distributed in Da-Yuan Industrial Park, and chromium and cobalt were the major heavy metal pollutants distributed in Kuang-Yin Industrial Park. The results of quantitative analysis indicated that nickel (Ni), molybdenum (Mo), silver (Ag), indium (In), and tungsten (W) were dominant heavy metals in Hsin-Chu Science Park.