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## FRACTIONATION OF ZINC IN MUNICIPAL SOLID WASTE LANDFILL LEACHATE: EFFECT OF LEACHATE RECIRCULATION

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### Abstract

Two sets of simulated landfill reactors, namely conventional landfill (CL) and leachate recirculated landfill (RL) were operated to investigate the effect of leachate recirculation on the fractionation of Zn in municipal solid waste (MSW) landfill leachate. Zn in landfill leachate was fractionated into three fractionations: particulate and colloidal matter >0.45  $\mu\text{m}$ , non-labile complexes <0.45  $\mu\text{m}$  and free cations/labile complexes <0.45  $\mu\text{m}$ . The result showed that the recirculation could decrease the total concentration of Zn in the leachate. The leached Zn was mainly present as free cations/labile complex and non-labile complexes at the beginning of the study. However, it was mainly present as particulate and colloidal matter >0.45  $\mu\text{m}$  and non-labile complexes at the end of the study, for both of landfills. The recirculation of leachate could facilitate the transformation of the fractionation of Zn. Moreover, large amounts of Zn mainly present as free cations/labile complexes and non-labile complexes were leached out from CL, while only small amounts of Zn mainly present as was particulate and colloidal matter >0.45  $\mu\text{m}$  were leached out from RL all through the study. It suggested the leachate recirculation not only reduced total leaching amounts of Zn, but also decreased the bioavailability and toxicity of the leached Zn.

*Key words:* fractionation, landfill, leachate recirculation, Zn

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