

Potential use of zirconium (IV) chloride as coagulant to treat semi-aerobic leachate treatment

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Abstract

Coagulation-flocculation is the most common chemical treatment method for wastewater treatment. Coagulant acts as neutralising agents for the electrical charges of particles in leachate. $ZrCl_4$, which has never been applied for leachate treatment before, was tested in this research. Standard jar testing was conducted to determine the optimal pH and dosage in removing colour, suspended solids (SSs), ammonia, and organic content [ultraviolet absorbance at 254 nm wavelengths (UV254)] from semi-aerobic landfill leachate. The optimal $ZrCl_4$ dosage and pH were 1,500 mg/L and 4, respectively. These values corresponded to 93.4%, 94.3%, and 97% removals for SS, colour, and UV254, respectively. However, ammonia could not be removed by the coagulant, with only 2.2% of removal at pH 4 and 1,500 mg/L $ZrCl_4$ dosage.

Keywords: zirconium chloride, $ZrCl_4$, coagulation, landfill leachate, leachate treatment, wastewater treatment, colour, suspended solids, ammonia, organic content

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