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COMPARISON OF THE STABILIZING CAPABILITIES OF IRON AND ALUMINUM IN TREATING WASTE HIGHLY CONTAMINATED WITH ARSENIC

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Abstract

Ferric sulfate and aluminum sulfate were applied to stabilize the available arsenic in solid waste residue (SWR) from the organic arsenic industry, previously pretreated by the semi-solid Fenton process. NaOH, Ca(OH)₂, and MgO were introduced to adjust the matrix pH. Toxicity characteristic leaching procedure (TCLP), synthetic precipitation leaching procedure (SPLP), and sequential extraction procedure (SEP) were carried out to evaluate the effect and difference on the fixation treatments of arsenic together. It showed that the introduction of ferric sulfate and aluminum sulfate to SWR could promote the stabilization of available As. The stabilization effectiveness was related to the pH value and the reagents for pH adjustment. In general, the ferric sulfate treatment could be more effective than the aluminum sulfate treatment. In assessing the results of TCLP, SPLP, and SEP, the ferric sulfate treatment at pH 4.0 by Ca(OH)₂ adjustment was considered as the optimal stabilization process for arsenic in SWR.

Key words: aluminum, arsenic, ferric, hazardous waste, stabilization

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