THE USE OF LADLE FURNACE SLAG IN THE TREATMENT OF CONTAMINANTS WATER IN ACID MINE DRAINAGE

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Abstract:
Once acid drainage is created it eventually flow over streams and rivers, thus, impact negatively on the quality of water bodies. This study aims to treat the water resources that contaminated with acid mine drainage (AMD) with various materials such as ladle furnace slag (LFS), bentonite and zeolite. Major element content in treatment materials were analyzed by X-Ray Fluorescence (XRF). The surface area is determined by using Ethylene Glycol Methyl Ether (EGME). Surface morphology of the sample was performed by Scanning Electron Microscopic (SEM). The pH value was determined by Hanna Instrument and heavy metal concentration was determined by ICP-MS using standard method and Batch Equilibrium Test (BET) for adsorption ability for treatment materials to remove heavy metals. LFS has the highest CaO content which is 55.96% compared to bentonite and zeolite, 2.05 % and 3.48% respectively. Specific surface area (SSA) for LFS is the highest value of 980.45 m²/g. From the adsorbent test, LFS has decreased the Pb ion from 707.47 mg/L to 3.81 mg/L. LFS has been chosen as the best adsorbent compared to the other material due to its high potential to neutralize pH as well as has great adsorption capacity in removal Pb metal ions up to 99.46 % for improving water quality.

Keywords : Ladle Furnace Slag (LFS); Acid Mine Drainage (AMD); Adsorbent

Acknowledgment