World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:13, No:03, 2019

Treatment of Acid Mine Drainage with Modified Fly Ash

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Abstract : Acid mine drainage (AMD) is the generation of acidic water from active as well as abandoned mines. AMD generates due to the oxidation of pyrites present in the rock in mining areas. Sulfur oxidizing bacteria such as Thiobacillus ferrooxidans acts as a catalyst in this oxidation process. The characteristics of AMD is extreme low pH (2-3) with elevated concentration of different heavy metals such as Fe, Al, Zn, Mn, Cu and Co and anions such sulfate and chloride. AMD contaminate the ground water as well as surface water which leads to the degradation of water quality. Moreover, it carries detrimental effect for aquatic organism and degrade the environment. In the present study, AMD is treated with fly ash, modified with alkaline agent (NaOH). This modified fly ash (MFA) was experimentally proven as a very effective neutralizing agent for the treatment of AMD. It was observed that pH of treated AMD raised to 9.22 from 1.51 with 100g/L of MFA dose. Approximately, 99% removal of Fe, Al, Mn, Cu and Co took place with the same MFA dose. The treated water comply with the effluent discharge standard of (IS: 2490-1981).

Keywords : acid mine drainage, heavy metals, modified fly ash, neutralization
Conference Title : ICWES 2019 : International Conference on Water and Environmental Sciences
Conference Location : Singapore, Singapore
Conference Dates : March 28-29, 2019