

Lead Removal by Using the Synthesized Zeolites from Sugarcane Bagasse Ash

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Abstract : Sugarcane bagasse ash of sugar factories is solid wastes that the richest source of silica. The alkali fusion method, quartz particles in material can be dissolved and they can be used as the silicon source for synthesizing silica-based materials such as zeolites. Zeolites have many advantages such as catalyst to improve the chemical reactions and they can also remove heavy metals in the water including lead. Therefore, this study attempts to synthesize zeolites from the sugarcane bagasse ash, investigate their structure characterizations and chemical components to confirm the happening of zeolites, and examine their lead removal efficiency through the batch test studies. In this study, the sugarcane bagasse ash was chosen as the silicon source to synthesize zeolites, X-ray diffraction (XRD) and X-ray fluorescence spectrometry (XRF) were used to verify the zeolite pattern structures and element compositions, respectively. The batch test studies in dose (0.05, 0.1, 0.15 g.), contact time (1, 2, 3), and pH (3, 5, 7) were used to investigate the lead removal efficiency by the synthesized zeolite. XRD analysis result showed the crystalline phase of zeolite pattern, and XRF result showed the main element compositions of the synthesized zeolite that were SiO₂ (50%) and Al₂O₃ (30%). The batch test results showed the best optimum conditions of the synthesized zeolite for lead removal were 0.1 g, 2 hrs., and 5 of dose, contact time, and pH, respectively. As a result, this study can conclude that the zeolites can synthesize from the sugarcane bagasse ash and they can remove lead in the water.

Keywords : sugarcane bagasse ash, solid wastes, zeolite, lead

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