

Somnate Chuntawitchaprapha 2011: Removal of Heavy Metal from Electroplating Wastewater Using Granule of Zeolite Synthesis from Bagasse Residue. Master of Science (Environmental Science and Technology), Major Field: Environmental Science and Technology, Division of Science. Thesis Advisor: Miss Prapa Sohsalam, Ph.D. 140 pages.

The granulation of zeolite synthesized from bagasses residue was studied. Granulation process was performed by wet-granulation with the mixture of polyvinyl alcohol and bentonite at 20 and 15% by wt. The diameter of zeolite granule is 2 mm . Surface area was $7.71 \text{ m}^2/\text{g}$ and calcium exchange capacity were $788.3 \text{ mg CaCO}_3/\text{g}$ zeolite

The granule of zeolite synthesis from bagasse residue was tested for mixed heavy metal (zinc, copper, chromium, cadmium and nickel) removal from the synthetic wastewater under batch condition. The highest removal efficiencies of zinc, copper, chromium, cadmium and nickel were 99.00, 98.71, 96.89, 96.23 and 93.66 % , respectively at pH 5, metal concentration of 6 mg/l, contact time at 120 min and 1 g of zeolite. It was described by Langmuir adsorption isotherm for synthetic wastewater which the adsorption capacities of granular zeolite for zinc, copper, chromium, cadmium and nickel were 9.98, 6.27, 5.96, 3.80 and 2.99 mg/g zeolite, respectively. The metal adsorption capacity of each type of zeolites were compared. These were ordered from best to fair efficiency as followed: powder of commercial zeolite, powder of zeolite synthesis from bagasses, granule of commercial zeolite, granule of zeolite synthesis from bagasses. The four types of zeolite showed the same metal adsorption affinity as $\text{zinc} > \text{copper} > \text{chromium} > \text{cadmium} > \text{nickel}$

The granule of zeolite was tested for heavy metal removal from the electroplating wastewater under batch condition. The removal efficiencies of zinc, copper, chromium, cadmium and nickel were 85.25, 82.63, 79.71, 74.21 and 71.51 % at pH 5, contact time at 120 min and 1 g of zeolite, respectively.

Student's signature

Thesis Advisor's signature