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SAWITRI IAMTRAKOON : USING CHITOSAN FROM CRAB
SHELL FOR INDUSTRIAL WASTEWATER TREATMENT : A CASE STUDY OF
ELECTRONICS INDUSTRY. THESIS ADVISORS : AURAPIN EAMSIRI, Ph.D.,
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This research was designed to find out the capability of chitosan from chitin as a coagulant and coagulant aid with FeCl_3 to remove heavy metals, lead and copper, from the contaminated wastewater by Jar Test experiment. Chitosan were separated from chitin extracted from sea crab shell by deacetylation with hot concentrated NaOH (50% w/w) then it was characterized. The synthetic wastewater which is prepared from lead nitrate and copper sulfate in both single and mixed solution were compared with electronics industrial wastewater in coagulation process then the heavy metals were analysed using AAS and the removal efficiency were calculated.

The results showed that yield and deacetylation of chitosan from chitin were 22% and 92.44%. In addition, the infrared spectrums of the produced chitosan from experiment were identical to the commercial chitosan in all major functional peaks. Using 0.2 mg/l of chitosan as a coagulant could give the removal efficiency of 76.985% for lead and 78.842% for copper at the initial concentration of 100 ppm with alkaline pH. In case of using chitosan as a coagulant aid with various concentration of FeCl_3 could give a higher removal efficiency than using FeCl_3 alone. The best conditions were obtained when using chitosan solution of 0.2 mg/l with 7 mg/l of FeCl_3 solution for the heavy metals concentration at 50 ppm and 100 ppm, respectively, while at the lower concentration of 10 ppm, the efficiency was low. Moreover, using chitosan as a coagulant aid was also more economical.