



Modification of Pineapple Leaf Cellulose with Citric Acid for Fe²⁺ Adsorption

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Abstract : Pineapple leaves have a high cellulose content, and it can be used as adsorbent for ion Fe²⁺ adsorption. Cellulose of pineapple leaf have low ability to adsorb, and modification by citric acid can increase ion Fe²⁺ adsorption. The purpose of this reseach were : (1) to determine the effect of citric acid concentration and temperature for cellulose modification forward the adsorption capacity (2) determine the effect of Fe²⁺ initial concentration forward in adsorption (3) determine the adsorption mechanism of the modified cellulose. Citric acid concentration were applied for reseach ; 0.1; 0.3; 0.6; and 0.9 mol/L respectively. Meanwhile for temperature modification used were 25, 50, 80, and 120°C. The characterization of modified cellulose was evaluated by BET (*Brunnear Emmet Teller*) analysis. The concentration of Fe²⁺ used were 20, 40, 60, 80, 100, and 120 mg/L. The isotherm mechanism adsorption was determined following Langmuir and Freundlich model. The result showed that modified cellulose with citric acid at 0.6 mol/L give Fe²⁺ adsorption by 2.45 mg/g. Modification cellulose at 80°C was able to adsorp Fe²⁺ in 2.26 mg/g. Moreover, this adsorbent has 733.725 m²/g of surface area and 162.17 Å of pore size. Meanwhile, the initial Fe²⁺ concentration for adsorption was reached at this best adsorption (2.74 mg/g) using 80 mg of modified cellulose adsorbent. And it was predicted the adsorption mechanism following Freundlich isotherm model.

Keywords : Fe²⁺ ion, adsorption, modification, pineapple leaves cellulose.

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