

143c Evaluate the Bacterial Polysaccharide of Xanthan Gum for the Biosorption of Heavy Metals from the Aqueous Solution

Tsair-Wang Chung, Mai-Tzu Chen, and I-Ya Lin

Xanthan gum is a polysaccharide produced by the *Xanthomonas campestris* fermentation process. Due to its special rheological properties, the xanthan gum is usually used in food industry, pharmaceutical and cosmetics. It wasn't used as a biosorbent in the past. Xanthan gum can attract cation because its backbone is similar to the cellulose and its side chain contains mannose and glucuronic. In this study the commercial xanthan gum was used as a biosorbent to investigate the adsorption capacity of Cu^{2+} , Zn^{2+} , Cd^{2+} , Pb^{2+} , and Mn^{2+} in the aqueous solutions. The maximum sorption capacity calculated by applying the Langmuir equation to a single ion adsorption was 57.22 mg/g for Cu^{2+} , 40.15 mg/g for Zn^{2+} , 41.66 mg/g for Cd^{2+} , 44.56 mg/g for Pb^{2+} , and 8.21 mg/g for Mn^{2+} at 25°C (free pH). The Langmuir isotherm model was developed and its regression constants, q_m and K , were obtained and discussed. This study approved xanthan gum possessing the property in biosorption of heavy metals and being a favorable sorbent. As noted that each biosorbent has different affinity order for ions. The biosorption process is a "green" process, which can reduce the environmental pollution, energy loss, and raw material waste.

Keywords: biosorption; polysaccharide; xanthan gum; heavy metal; equilibrium isotherm