



## Cr(VI) adsorption on a thermoplastic feather keratin film

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### ABSTRACT

Feather is a kind of waste and hardly to be degraded in the environment. Thermoplastic film was made from feather by mechanical method with enhancing the temperature and pressure to 160°C, 5 MPa, respectively. Glycerol was added as plasticizer in various amounts in mass ratio of 10, 20, 40, 60, and 80%, respectively. During film preparation, influence glycerol content on film's mechanical property was studied, and 40% was chosen as the best ratio. Film with the best mechanical property was used to adsorb Cr(VI) in aqueous solution. Effects of temperature, adsorbent dosage, initial concentration, and pH on adsorption were studied. The adsorption was endothermic and fitted to both Langmuir and Freundlich models, and the process contained both physical and chemical adsorptions. The biggest removal rate was 99.1%, and the best absorption capacity was 75.45 mg/g at 60°C. After adsorption, there appeared many particles on the surface of the film that can be seen in SEM. FT-IR was used to study the chemical group changes between the films before and after adsorption.

*Keywords:* Feather; Wastewater; Cr(VI); Adsorption

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