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A feasible study on the application of raw ostrich feather, feather treated with H_2O_2 and feather ash for removal of phenol from aqueous solution

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ABSTRACT

Phenol, one organic pollutant, is extremely toxic for humans and the environment. The removal of phenol and its compounds from water and wastewater is serious problem. In this study, ostrich feather was used as the sorbent for the removal of phenol from aqueous solutions. For this purpose, raw ostrich feathers (ROF), feather treated with H_2O_2 (TOF) and its ashes (OFA) were used. In this study, ostrich feather was used in doses 0.2, 0. 3, 0 .5, 0.7, 1 and 1.5 $\frac{g}{100ml}$. Also, effect of different variables such as pH, contact time, amount of sorbent and temperature has been determined. Then, accuracy of data was examined by Freundlich, Langmuir and BET equations. Optimum phenol adsorption was observed at pH 2 and pH 3 for ROF/ TOF and OFA, respectively. Results showed that 0.7 g of ROF and TOF and 2 g of OFA removed 83, 73 and 90.4% at 30°C after 24 h, respectively. Results also indicated that ostrich feather, as a solid waste of the poultry processing plant, can be used as an effective biological sorbent for phenol removal from aqueous solutions.

Keywords: Phenol; Feather; Isotherm; Adsorption

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