

**REMOVAL OF PHOSPHATE AND PHENOL IN WASTEWATER
USING NATURALLY AVAILABLE MATERIALS**

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The present work involves an investigation of the possible use of peat, laterite and red earth adsorbents for removal of phosphate as well as phenol by peat from wastewater. The study was realized using column and batch experiments. Adsorption studies were conducted by 50 mg/l phosphate and phenol solution placed in a various masses of adsorbent containing erlenmyer flask and results showed that for removal of 50 mg/l phosphate in 100 ml of solution a minimum dosage of 3.5 g of peat, 5 g of laterite, 6 g of red earth required for 92.8%, 89.8% and 87.6% phosphate removal at equilibrium respectively. Removal of 50 mg/l phenol in 50 ml of solution a minimum dosage of 3 g of peat required for 95% phenol removal at equilibrium. Adsorption isotherm data could be interpreted by the Langmuir and Freundlich equations. The suitability of Freundlich, Langmuir adsorption models to the equilibrium data was investigated for each phosphate and phenol adsorbent system. The results showed that the equilibrium data for all the phosphate and phenol sorbent systems fitted the Langmuir model best.

A series of column experiments were performed to determine the breakthrough curves. 500 mg/l phosphate and 100 mg/l phenol solutions were fed at a 14 cm and 5 cm fixed bed column and breakthrough curves were constructed to obtain estimated adsorption capacity values of 17.96, 4.44, 4.05 mg phosphate/g adsorbent for peat, laterite, red earth and 13.56 mg phenol/g for peat respectively. A comparative study showed that peat is very effective than laterite and red earth for phosphate removal. The studies showed that the peat can be used as an efficient adsorbent material for removal of phosphate and phenol from water and wastewater.