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ADSORPTION OF LEAD AND COPPER FROM AQUEOUS SOLUTION USING UNMODIFIED WHEAT STRAW

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Abstract

Potential of unmodified Wheat Straw as an adsorbent for the removal of lead and copper was studied. Effect of pH, adsorbent dose, contact time and initial metal concentration on the removal of the metal ions were also investigated. Maximum removal of lead was found to be 43.55% by wheat straw under optimum conditions (pH=5, adsorbent dose=16g/L, contact time= 240 minutes, metal concentration=100 mg/L). Unmodified Wheat straw removed 0.381 mg/g of lead. While 56.36% copper removal was achieved using unmodified wheat straw under optimum conditions (pH=5, adsorbent dose=20g/L, contact time= 120 minutes, metal concentration=100 mg/L). Unmodified Wheat Straw removed 0.587 mg/g of copper. Langmuir isotherm was found to validate the equilibrium data of adsorption while kinetics were described by pseudo second order rate equation for both the metals. Furthermore, competitive adsorption of lead and copper showed that lead had more affinity for Wheat Straw as compared to copper. It was concluded that removal efficiency of unmodified Wheat Straw is much less as compared to modified Wheat Straw.

Key words: adsorption, copper, heavy metal, lead, unmodified wheat straw

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