

# **Nitrate removal from aqueous solution using biosorbent: equilibrium and kinetics studies**

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**ABSTRACT** - Nitrate removal from aqueous solution was investigated using ZnCl<sub>2</sub> and phosphoric acid activated carbon developed from pomegranate peel with particle size 0.4 mm. Potassium nitrate solution was used in batch adsorption experiments for nitrate removal from water. The effects of activated carbon dosage, time of contact and pH were studied. The equilibrium time was found to be 45 min. Two theoretical adsorption isotherms namely Langmuir and Freundlich were used to describe the experimental results. The Langmuir fit the isotherm with the theoretical adsorption capacity ( $q_i$ ) was found 78.125 mg/g. Adsorption kinetics data were modeled using the pseudo-first and pseudo-second order and intraparticle diffusion models. The results indicate that the second-order model best describes adsorption kinetic data. Results show activated carbon produced from pomegranate is effective for removal of nitrate from aqueous solution.

**Key Words:** Adsorption, kinetics, equilibrium, isotherm, activated carbon, pomegranate peel.