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## **ADSORPTIVE REMOVAL OF PHOSPHATE FROM AQUEOUS SOLUTIONS BY WASTE SNAIL AND CLAM SHELLS**

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### **Abstract**

Large quantities of snail and clam shells are left as waste material when their meat is used as food for people. It has been a big problem that how to treat these wastes and usually these are land filled as wastes. In the present paper, these shells are studied as recycling resource for phosphate removal from solutions. Laboratory-scale batch experiments were conducted to evaluate the efficiency of snail and clam shells in removing phosphate from aqueous solutions. Major factors investigated were: pH, initial solution phosphate concentration and calcination of shells at 700°C. The results showed that pH is the most important influencing factor among the other factors on phosphate removal by both types of shell powder. The natural snail and clam can remove over 97 % of 20 mg/L phosphate especially at initial solution pH 1.5 in 14 h. The saturation adsorption capacities (mg / g) of natural snail and clam shells were 2.99 and 0.85, respectively. Calcination can increase both shells phosphate removal efficiencies especially at high pH values. By oscillation in citric acid (2%) for an hour, more than 86 % of the phosphate adsorbed on the natural and calcinated adsorbents dissolve out.

It is concluded that both types of shell powder are efficient adsorption materials for phosphate removal from aqueous solutions.

*Key words:* adsorption, calcination, phosphate removal, snail and clam shells powder

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