



## PHYSICOCHEMICAL PROPERTIES OF MACROPOROUS SUGAR BEET PULP USED AS BIOSORBENT

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### ABSTRACT

The biosorption potential of sugar beet pulp was investigated through removal of molassigenic (sodium, potassium and calcium) metal ions from alkalized sugar juice. In the preliminary study was obtained optimum pH, biosorbent dosage and temperature of alkalized juice. Experiments were done in closed-loop adsorption system with adsorption column. Characterization of the biosorbent includes CHNS analysis, Mercury intrusion porosimetry study, BET porosimetry and XRD analysis. Alkalized juice represents multicomponent system with various components (minerals and metals) dissolved inside. During removal of molassigenic metal ions the competition for the active places on the biosorbent are present and system of metal ions removal becomes more complex. When the biosorption equilibrium was achieved, dependence between metal ions at the surface of the biosorbent ( $q_e$ ) and concentration of metal ions in the alkalized juice ( $C_e$ ) was examined. Ratio between  $C_e$  and  $q_e$  was characterized by using adsorption isotherms. Langmuir model describes the most reliable removal of sodium and potassium, whereas Freundlich model describes removal of calcium ions. The data depicted the revalorization of sugar beet pulp as a promising lignocellulosic eco-friendly and economic biosorbent for sodium, potassium and calcium sequestration.

*Keywords: biosorption, sugar beet pulp, porosity, metal ions removal*

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