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AGRICULTURAL WASTES AS LOW COST MATERIAL FOR HEAVY METALS REMOVAL

Marija Petrović¹, Tatjana Šoštarić¹, Mirjana Stojanović¹, Jelena Petrović¹,
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Removal of Pb(II), Cu(II) and Zn(II) from aqueous solutions by low cost agricultural wastes was investigated.

The effect of the initial pH value, biomass dosage, initial metal concentration and contact time was investigated in batch system. It is found that metal uptake increased with increasing the initial pH value, initial concentration and contact time but decreased with increasing biomass dosage. The optimum pH value for biosorption process of the metal ions was found to be ranged from 5.0 to 6.0 for all investigated materials.

The experimental data well fitted to the Langmuir isotherm model. The maximum biosorption capacities of investigated agricultural waste materials followed the order: Pb(II) > Cu(II) > Zn(II). Kinetic data well fitted to the pseudo-second-order kinetic model. The kinetic study revealed that biosorption process is fast.

Desorption study was done due to of the need to recycle metal loaded materials and dispose them. Obtained results revealed that investigated agricultural wastes after biosorption process can be efficiently recovered with diluted HNO₃.

From obtained results and their comparison to different biosorbents reported in literature it can be concluded that investigated agricultural wastes can be used as natural, low cost, effective and ecofriendly materials for heavy metals removal from water solutions.

Keywords: agricultural wasters, biosorption, heavy metals, desorption study