

Each of us contributes to producing wastewater. Before it is discharged to water, wastewater needs to be treated. Sewage sludge is produced during wastewater treatment. It contains many beneficial substances that positively affect soils. Therefore, application of sewage sludge to soils is an interesting method for its management. In this way, valuable raw materials are recovered and at the same time the use of artificial fertilizers is reduced. Other alternative methods include agricultural use of digestate formed during biogas production or compost from sewage sludge. During these processes, under anaerobic (fermentation) or aerobic conditions (composting), respectively, bacteria degrade unstable organic compounds in the sludge, which leads to obtaining a stable material. Most micro- and macronutrients, being of nutritional value for plants, remain in the produced digestate or compost. Depending on their origin, sludges can also contain hazardous substances such as heavy metals. Heavy metals are persistent, that is, they do not undergo microbial degradation and hence their amount in the digestate and compost is higher than in the sludge. During multiple application of sludge, digestate or compost, heavy metals can accumulate in the soil. Therefore, agricultural use of these materials is subject to strict regulations regarding control of heavy metal content. Only sludges (or digestates) whose concentrations of Cd, Cu, Ni, Pb, Zn, Hg, and Cr do not exceed the legal limits may be approved for use in agriculture or for production of compost used in agriculture. Given the above, removal of heavy metals from sewage sludge can be a direction that will allow it to be used more widely in agriculture. The currently used methods for removing metals from sludge are expensive and are characterized by substantial consumption of chemicals and heat energy. However, metals can also be removed from sludges with ionic liquids. These are unusual salts as they consist of a large and non-symmetric cation and a small anion, due to which these ions are not arranged regularly and do not attract each other so strongly as, for example, in the case of kitchen salt. For this reason, ionic liquids occur in the melt state at temperatures  $<100^{\circ}\text{C}$ . Due to their occurrence in ion form at low temperatures, they can extract metals from different materials. The objective of this project is to obtain digestates and composts with a reduced content of heavy metals, which will then be used as fertilizers in the cultivation of various plants. In addition, the research will include the ecotoxicological assessment of the obtained materials, in the context of environmental risk and their fertilization values.