

***The effect of the selected molecular fractions of humus substances on bioavailability of cadmium ions – Chemistry of the processes - supervisor: prof. Z. Sokołowska***

Humus substances play key role in environment determining soil fertility, and thus the conditions of plant growth and development. The above compounds exhibit high reactivity, which has a great impact on the binding processes of nutrients but also impurities, including sorption of heavy metals. However, these processes are extremely complex, mainly due to the large chemical diversity of humic substances. The size of organic molecules as well as degree of their aggregation (resulting from different pH conditions) appear to be one of the most important determinants of metal binding mechanisms and bioavailability to plants. The aim of the studies will be focused on the analysis of the influence of different fractions of humic substances on the mechanism of binding of cadmium ions. Bioavailability of the element in form of complexes with humic substances will be also investigated. The processes will be analyzed in a wide range of pH and metal concentrations using modern measuring techniques including: FTIR, UV-VIS, fluorescence and atomic absorption spectrometry, as well as potentiometric titration, thermogravimetry coupled with FTIR spectroscopy and mass spectrometry.