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Biotechnology for wastewater treatment

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Biotechnology of wastewater treatments using microorganisms for removal of heavy metals offers an alternative to conventional techniques due to its low cost, high adsorption capacity and no secondary pollution. The results on the use of microalga *Spirulinaplatensis* and *Nostoclinkia* for the removal of chromium and nickel from wastewater of galvanic industry are reported. Two complementary analytical techniques: atomic absorption spectrometry (AAS) and epithermal neutron activation analysis (ENAA) - were used in this study.During one hour experiment 90% of chromium and 60% of nickel were removed from the wastewaters as determined by AAS. The samples of dry microalgae biomass after exposure to wastewater were subject to nondestructive instrumental neutron activation analysis. A total of 21 elements (Na, Mg, Al, Cl, K, Ca, Sc, Cr, Mn, Fe, Ni, Co, Cu, Zn, As, Br, Rb, Sb, Ba, Ce, Cs) were determined in the microbial cells. In addition to Cr and Ni, adsorption of such metals as Ba, Cu, Fe, Ni, and Zn was observed. Fourier Transform Infrared technique allowed to reveal changes in the chemical structure of microalga biomass after interaction with wastewater. The IR spectra point to the presence of surface functional groups like OH, NH_2, NH-CH_2, $(NHC(O)_{amid})$, P=O, S=O and their involvement in the adsorption process.The result obtained indicates the applicability of the studied microalgae for complex purification of industrial wastewater.

Biography

I Zinicovscaia is a PhD student of the University of the Academy of Science of Moldova, Rupublic of Moldova (scientific supervisors: Academician Gheorghe Duca and Dr. Marina Frontasyeva) and Scientific researcher of the Joint Institute for Nuclear Research, Dubna, Russia. She has 10 papers published in reputed journals and participated in 20 conferences.

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