STABILIZATION OF METALS AND METALLOIDS USING Mg-Fe LAYERED DOUBLE HYDROXIDES

Barbora Hudcová, Michael Komárek, Zuzana Michálková, Martina Vítková
Czech University of Life Sciences Prague, Department of Environmental Geosciences, Kamýcká 129, 165 21, Prague 6 – Suchdol, Czech Republic, email:hudcovab@fzp.cz.cz

Abstract
Layered double hydroxides (LDHs) and the products of their thermal treatment (mixed oxides) are highly effective adsorbents of oxyanions, but there are only few studies concerning cation sorption. Therefore, this study was focused on the synthesis and characterization of Mg-Fe LDH for adsorption of Zn^{2+}. Characterization of Mg-Fe LDH was performed using XRD, BET and FTIR-ATR analyses. Based on batch adsorption experiments, adsorption kinetics and isotherms were constructed. Concentrations of Zn after sorption were determined using ICP-OES and the solid phase was analysed using FTIR-ATR. The highest adsorption capacity for Zn^{2+} was observed for Mg-Fe LDH with the molar ratio of 4:1.

Key words:
Layered double hydroxides, adsorption, metals, adsorption isotherms, adsorption kinetics