

ABSTRACT

Pollution of the aquatic environment with heavy metals is one of the major problems associated with rapidly developing civilization and is of particular importance due to the role that water plays in nature and human life. This makes it's necessary to rational and efficient use of its resources and protection against pollution.

On account of physicochemical properties (high surface area, porosity, cation exchange capacity) sorption affinity for inorganic and organic ions and low cost are most promising and attractive material in removal of heavy metal ions from water and wastewater using sorption methods.

Monomineral zeolite structures as sodalite, Na-P1, NaX obtained from coal fly ash under hydrothermal crystallization conditions and natural zeolite (clinoptilolite) were selected for sorption of heavy metal ions (Cr(III), Cu(II), Zn(II), Cd(II)) from wastewater and aqueous solutions

The effect of initial concentrate of heavy metals ions, doze of zeolites, kind of anion and pH of solution was investigated under batch condition contacting the solid phase (m) : the ion solution (v). The experimental data were modeled using the Freundlich, Langmuir and Dubinin-Raduszkiewicz adsorption isotherms.

The process for removing of Cr(III), Cu(II), Zn(II) and Cd(II) ions from aqueous solution on natural zeolite and synthetic zeolite occurs by three processes the ion exchange, adsorption/precipitation.

The maximum sorption capacity of synthetic zeolites to the studied ions were suitable: from 10.3 to 27.3 (for Cr(III) ion), from 5.9 to 20.8 (for Cu (II) ion), from 1.6 to 12.7 (for Zn(II) ion) and from 2.5 to 7.5 (for Cd(II) ion) times higher than the maximum sorption capacity of the clinoptilolite.