

2nd International Conference on

POLLUTION CONTROL AND SUSTAINABLE ENVIRONMENT

October 05-06, 2017 London, UK

Removal of heavy metal ions from aqueous solutions by using functionalised polymer adsorbents-mathematical modelling of adsorption process

Gabriela-Nicoleta MoroiPetru Poni¹ Institute of Macromolecular Chemistry, Romania

Heavy metals and their compounds have applications in many different domains, being essential to economic development, but are among the most dangerous contaminants producing water, air and soil pollution. These highly toxic metals are usually introduced into natural water resources by wastewaters resulting from various industrial activities, negatively affecting environment quality as well as human health. For public health protection and environmental conservation, heavy metal removal from contaminated waters is an absolute necessity. In the present work, the possibility of employing functionalised polymer adsorbents to remove heavy metal ions from aqueous solutions was investigated. The influence on adsorption performance of various factors (e.g., the initial pH, metal ion species and metal ion concentration of the solution and the content of functional groups of the adsorbent) as well as the structure of the coordination compounds formed by adsorption were determined. Mathematical modelling of heavy metal ion adsorption was performed by considering several isotherm models to describe the experimental data. Isotherm model adequacy was accurately assessed by employing criteria based on various error functions taking into account the number of experiments, the measured equilibrium adsorption capacity, the predicted equilibrium adsorption capacity and the numbers of independent variables and parameters in the regression equation. The model providing the best description of the adsorption process for each metal ion species was established. Modelling results confirm that heavy metal ion adsorption is a feasible and spontaneous chemisorption process. The functionalised polymer adsorbents have potential applications in wastewater treatment for removal of heavy metal ions.

Biography

Gabriela-Nicoleta Moroi has completed her PhD from "Al.I. Cuza" University of Iasi. She has published more than 35 papers in well-known journals in various domains: metal ion adsorption onto functionalised polymer adsorbents, synthesis and characterization of metallopolymers, thermal degradation of polymers etc.

gmoroi@icmpp.ro

Notes: