

Metal ion retention from aqueous solution using the ultrafiltration technique: Preparation, retention capacity of copolymers of N-maleimide derivatives with ?-methylhydrogen itaconate and metal complexes

Pizarro, Guadalupe del C.

Marambio, Oscar G.

Jeria-Orell, Manuel

Huerta, Margarita R.

Rodríguez, Oscar O.

Olea-Azar, Claudio

Rivas, Bernabé L.

Habicher, Wolf D.

Chlorophenylmaleimide (Cl-PhMI) and N-maleoylglycine (N-MG) with ?-methylhydrogen itaconate (?-MHI) were copolymerized by radical polymerization, and their metal ion retention capacity (MRC) and thermal behavior were studied. The copolymers were obtained by varying the mole fraction of Cl-PhMI or N-MG in the feed from 0.25 to 0.75. The monomer reactivity ratios, r_1 and r_2 , were determined using the Kelen-Tüdös method. The molecular weight and polydispersity were also determined. The capacity to remove several metal ions, such as Cu(II), Cr(III), Co(II), Zn(II), Ni(II), Pb(II), and Fe(III), in aqueous phase was determined using the liquid-phase polymer-based retention technique. Inorganic ion interactions with the hydrophilic polymer were determined as a function of pH and the filtration factor. The MRC depends strongly on the pH. Metal ion retention increased with increases in pH and the content of ?-MHI units in the macromolecular backbone. The copolymers and polymer-metal complexes o