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Functional polymers with properties to remove inorganic pollutants

The need for water is increasing around the world. Oxyanions and metal ions pollution in water concern to worldwide due the toxic effect on humans. Currently, there are available several technologies and processes to remove these pollutants from aqueous sources, such resin nanocomposites, differential precipitation, solvent extraction, distillation, ion exchange, membranes. Membrane filtration easily allows this separation by means of the technique called the liquid-phase polymer-based retention (LPR). Applications of water-soluble polymers to the enrichment or separation of several metal ions and oxyanions from water have been reported. Through to washing or enrichment methods, Cr(VI), V(V), Mo(VI), and As(V) removal experiments were carried out at different pH using water-soluble polymers (WSPs) containing functional

quaternary ammonium salts. The results showed highest retention capacity of oxyanions depending on the pH. On the other hand, polymer-clay nanocomposites present enhanced properties (mechanical, thermal, and barrier properties) compared with starting material (unloaded polymers). The use of polymer matrix with organic functional with capability to retain ion and filler such as clays lead to nanocomposite ion exchange resins. We have also studied polymer nanocomposite loaded with layered double hydroxide (LDH) as sorbents for oxyanions such as arsenate, chromate, and vanadate. Under different experimental conditions, the composite exhibited a high sorption reaching almost a 100% of removal. Also, the sorption of oxyanions presented a fast kinetics.

Biography

Bernabe L Rivas has completed his PhD from the University of Concepcion in 1980 and postdoctoral studies at Tuebingen University, Germany with Humboldt Foundation Fellows (1989-1991). He is the Leader of the research group about Synthesis and Applications of Functional Polymers, Polyelectrolytes, Resins with Retention Properties for Pollutants Ions, Nanocomposites from polypropylene and biopolymers. He has published more than 400 papers in reputed journals, 29 chapters of books and has been serving as an editorial board member of Journals.

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