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Ionic liquids as effective carriers of precious metal ions in membrane processes from leach liquors of metal waste

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Many secondary sources contain very often valuable metals. Spent catalysts and industrial wastes can be source of platinum group metals (PGMs). In hydrometallurgical technologies, we obtain acidic solutions after leaching of the metal wastes by inorganic acids. This solution contains usually mixture of different metal ions which should be separated. This separation stage is necessary in the hydrometallurgical process because make possible to obtain clean products in the next stages, such as electrolysis, crystallization, etc. In this work, the transport of palladium(II) from acidic chloride solutions across polymer inclusion membranes (PIM) with phosphonium ionic liquid as ion carrier was studied. Transport through PIM is separation technique of metal ions from aqueous solutions. Effect of the membrane composition on the palladium(II) recovery has been studied. Phosphonium ionic liquids are very interesting group of the ionic liquids (ILs). Their structure and physicochemical properties caused that these compounds are recognized as the promising ion carriers of metal ions from aqueous solutions. The ion carriers are used for the synthesis of polymer inclusion membranes, which also contain polymer matrix (i.e. cellulose triacetate, CTA) and plasticizer (i.e. nitrophenyl alkyl ether). Effective and selective transport of metal ions from the aqueous source phase containing different metal ions into receiving phase depends strongly on the kind and concentration of ion carrier in membrane. Evaluation of the conditions of palladium (II) facilitated transport from hydrochloric acid solutions can be very useful in recycling process of the spent catalysts.

Biography

Beata Pospiech has completed her PhD in 2005 at Czestochowa University of Technology, where she currently works in Department of Chemistry. Her research is focused on the hydrometallurgical methods of non-ferrous metals recovery, especially on the separation of metal ions from aqueous solutions by solvent extraction and transport across polymer inclusion membranes (PIM) containing various compounds as ion carriers. She is a member of European Membrane Society (EMS). She has published more than 20 papers in reputed journals from *Journal Citation Reports (JCR)*.

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