543h Separation of Metal Ions by a Column Packed with Microcapsules Containing Tricaprylmethylammonium Chloride and DI-2-Ethylhexyl Phosphoric Acid

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In recent years, the need of more specific system for recovery heavy metals from their dilute solutions has produced an important development of solvent extraction. The selective extractant encapsulated by polymeric materials offers some advantages over traditional liquid-liquid extraction such as higher surface area, easier phase separation. In our work, polystyrene microcapsules containing tricaprylmethylammonium chloride (Aliquat 336) and polysulfone microcapsules containing di-2-ethylhexyl phosphoric acid (D2EHPA) have been prepared. And the separation and recovery of metals from a simulated electroplating waste solution, containing Cr(VI), Zn(II), Cu(II) and Ni(II), have been investigated. The results showed that the morphology and monodispersity of microcapsules are both greatly related to the dispersion agent. The mean diameter of the obtained microcapsules was at micron level. Chromatographic operation, using a column packed with microcapsules, showed that Cr(VI) was perfectly separated and recovered by the Aliquat 336 microcapsules. The three other remaining heavy metals may then separated by the D2EHPA microcapsules. The extractability of these three metals is Zn(II)>Cu(II)>Ni(II). Finally, the stability experiment showed that the Aliquat 336 microcapsules had a sufficient metal ions extraction capacity for reuse processing and extraction-stripping cycles indicated no decline in extractability. But the stability of the D2EHPA microcapsules was not so good.

Keywords: Microcapsules; Separation; Aliquat 336; D2EHPA