Liquid-Solid Extraction of Bi(III) by Extractant-Impregnated Resin Technique (EIR)

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Bismuth is used in the cosmetic products; e.g., for the preparation of creams and hair dyes, drugs manufacture; e.g., bismuth nitrate is used for treating intestinal disorders, and in other various applications [1,2].

The metal extraction is a major challenge in the valuable metals recovery, as well as addressing the environmental pollution problems. Conventional techniques of metal ions removal from environmental matrices include the following processes: Precipitation, solvent extraction, ion exchange, adsorption, electrochemical recovery and other techniques are currently the most widely used in treatment techniques. These last may be ineffective because sometime fail to meet regulation levels for technical or/and economical reasons [3].

Extractant-impregnated resin technique (EIR) has been postulated as an effective alternative for the separation and recovery of species from dilute solution. The use of macroporous organic polymers supports, with a high surface area and good mechanical stability, containing selective extraction reagents offers many advantages over the liquid–liquid extraction usually used at industrial scale [1,2].

The investigations carried out on the extraction kinetics of bismuth (III) from nitrate solutions by EIR using the Amberlite XAD-1180 resin, impregnated with di(2-ethylhexyl)phosphoric acid (D2EHPA) as organophosphorus extractant, while varying the experimental parameters showed that the bismuth was extracted at 98.5%. The experimental values were used to determine the polynomial model constants which are adjusted to the studied property variations for bismuth (III) extraction.

REFERENCES