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Retention characteristics of bismuth (III) from aqueous media using 1, 10-phenanthroline impregnated polyurethane foam sorbent: Kinetic and thermodynamic study

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Pollution of aquatic environment with heavy metal ions has become one of the modern man's preoccupations. Thus, the present study reports the sorption characteristics of Bi^{3+} from aqueous iodide solution using 1,10-phenanthroline impregnated polyurethane foam (PUF) as a low cost and effective solid phase extractor (SPE). Batch mode of separation was used for studying the operational parameters such as adsorbent dose, solution pH, initial analyte concentration and contact time. The equilibrium data fitted well with pseudo-second-order kinetic model ($R^2 > 0.99$). Thermodynamic studies showed that the retention step was exothermic, and spontaneous in nature. The results indicated that the developed sorbent provides an effective and economical approach in highly reducing or almost eradication Bi^{3+} from the aqueous sol. The method was successfully applied for the analysis of Bi^{3+} in real tap water samples.

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