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Rhodium(III) Recovery from HCl Solutions Using 4-Alkylaniline-Impregnated Resins

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In this study, 4-butylaniline-impregnated resins (BuIRs) were prepared by soaking hydrophobic porous resins in aqueous solutions of 4-butylaniline hydrochloride. Rh(III) was successfully adsorbed by BuIRs from 10 ppm Rh(III) solutions (6 M HCl). The quantitative desorption of Rh(III) accompanied with 4-butylaniline hydrochloride from BuIRs was also achieved by Soxhlet extraction using methanol. UV-Vis absorption measurements of Rh(III)-containing solutions showed that the equilibrium shift of Rh(III)-based species in HCl solutions is slow, and heating of the solutions is effective for equilibrating. The BuIRs obtained in this study effectively recovered the Rh(III) chloro-complex anion ($[RhCl_6]^{3-}$) from low Rh(III) concentration solutions, and can be useful in the Rh(III) recovery process.

Keywords : platinum group metals / rhodium / adsorption / 4-alkylaniline / porous resin