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Solvent extraction of americium by imidophosphates

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Solvent extraction was described for the analytical determination of the americium in the liquid samples. Arylesters of imidodiphosphoric, imidothiodiphosphoric, imidodithiodiphosphoric acids and tetraphenylimidodithiodiphosphine were used as representatives of bidentate organophosphoric chelating agents. Pentaphenyldiimidotriphosphate, from the group of tridentate agents, was used. The extraction properties of tetraphenyl imidodiphosphates and their sulphur analogues for trivalent americium in 0.1-1 mol/L HNO₃ into toluene and also in linear combination with TOPO were investigated. The dependences of equilibrium ratios of the americium on analytical or equilibrium concentration of chelating agents, pH, initial concentration of nitric acid and initial concentration of TOPO were studied.

The structures of the complexes in the organic phase were determined and the value of extraction constants were calculated for all systems. The optimal extracted species were AmA₃, AmA₃(HA), the addition of TOPO induced synergistic extraction of AmA₃.TOPO. The utilization of sulphur analogues was insignificant.

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