The Effect of Solvents on the Adduct Formation of Uranyl Thenoyltrifluoroacetonate with Tributyl Phosphate

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Abstract

Addition compound formation between uranyl bis-thenoyltrifluoroacetonate (UO_2A_2) and tributyl phosphate (S) was studied by partition method, using uranium-237 as the tracer. The formula of the adduct complex was shown to be UO_2A_2S. The solvent effect on the adduct formation constant was taken into account in connection with the activity; the activity coefficients of each species in various solutions were calculated from the molar volume and the solubility parameter. The formation constants based on the molar fraction, K_x, in a number of solvents were preestimated, employing log K_x=7.08 in carbon tetrachloride as a reference. They are in agreement with the observed values. The formation constant in terms of activity was found to be constant log K°_s=5.77±0.30. A correlation between the formation constant of the two adducts, UO_2A_2S and ZnA_2S, was demonstrated.

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