Azo-substituted ethoxyacridine – reagents for the extraction-photometric determination of indium(III)

© Namig I. Ismailov,*⁺ Sevinj N. Osmanova,
Melek M. Agamaliyeva, and Aisha M. Nasibova

Institute of Catalysis and Inorganic Chemistry Named after Acad. M.Naghiyev of Azerbaijan National Academy of Sciences. H. Javid Ave., 113. Baku, AZ1143. Azerbaijan. E-mail: o.sevinc1985@rambler.ru

*Supervising author; ⁺Corresponding author

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Abstract

The associates of bromo-indate with azo-substituted ethoxyacridine have been studied by spectrophotometric method. It has been found that the associates are well extracted with a mixture of chloroform acetone (4:1). The optimum volume of aqueous and organic phase is equal to 5 ml. The molar ratio of the components in the extractable compounds was studied by the methods of isomolar series, equilibrium shift and a straight line. It was found that bromo-indate associated with azo-ethoxyacridines (AE) in a ratio of 1:1.

Study of the effect of foreign ions on the accuracy of the determination of indium with azo-substituted ethoxyacridine showed that the number of ions does not interfere (in parentheses are multiple relationships to indium ions); Cd^{II} (1200), NH₄⁺ (4000), Zn²⁺ (1500), Co^{II} (1100), Ni^{II} (1050), Cu^{II} (500), Fe^{II} (4000), Pb^{II} (250), Nb (250), Ta^V (270), Al³⁺ (2000), Re^{VII} (140), B³⁺ (410), C₂O₄²⁻ (1900), CH₃COO⁻ (1300), ascorbic acid (270), citrate ion (3500), tartrates (4000), EDTA (3700). Number of ions interfered the determination: Tl^{III} (1), Fe^{III} (1), Ga³⁺ (1), Hg^{II} (1), Sb^V (1), Au^{III} (1), thiourea (4).

It was studied formation and extraction of associates of bromo-indate with AEADPA (2-ethoxy-6-(4-*N,N*-dipropylphenylazo)-9-aminoacridine) and AEADEA (2-ethoxy-6-(*N,N*-ethylphenylazo)-9-aminoacridine). The maxima of light absorption of bromo-indate with AEADPA is observed at 530 nm, and the AEADEA at 515 nm.

The physico-chemical and analytical characteristics of the azo-substituted ethoxyacridines and their ionic associates with indium bromide acid complexes ($\lambda_{\max}$, ϵ , β kD, D, R%) were determined.

It was shown that bromo-indate compounds with azo-substituted ethoxyacridines are ionic associates, the molar ratios of the components in which are:

Highly efficient extraction-photometric methods have been developed for the determination of trace amounts of indium in various objects.

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