

*Thematic section:* Research into New Technologies.

*Subsection:* Technology of the Inorganic Substances.

**Full Paper**

*The Reference Object Identifier* – ROI-jbc-B/21-2-3-7

*The Digital Object Identifier* – DOI: 10.37952/ROI-jbc-B/21-2-3-7

Received 17 September 2021; Accepted 20 September 2021

## Associates of gold(III) with azo-substituted ethoxyacridine

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**Keywords:** extraction-photometric analysis, azo-ethoxyacridines, determination of gold(III).

### Abstract

The associates of tetrachloroaurate ion ( $\text{AuCl}_4^-$ ) with azo-substituted ethoxyacridine have been studied by spectrophotometric method. It was found that the associates are well extracted with a mixture of dichloroethane-acetone mixture (4: 1). The optimal volume of the aqueous and organic phases is equal to 5 ml. The molar ratio of the components in the extracted compounds were studied by equilibrium shift, isomolar series and straight line methods. It was found that  $\text{AuCl}_4^-$  associated with azo-substituted ethoxyacridines (AE) in a ratio of 1:1.

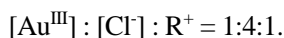
The study of the influence of foreign ions on the accuracy of the determination of gold with AE showed that the number of ions do not interfere with the determination (the multiple ratios of ions to gold (III));  $\text{Al}^{3+}$  (450),  $\text{Gd}^{\text{II}}$  (1000),  $\text{Zn}^{2+}$  (1400),  $\text{Co}^{\text{II}}$  (1000),  $\text{Ni}^{\text{II}}$  (1100),  $\text{Cu}^{\text{II}}$  (700),  $\text{Fe}^{\text{II}}$  (3200),  $\text{Pb}^{\text{II}}$  (300),  $\text{Nb}$  (400),  $\text{Ta}^{\text{V}}$  (320),  $\text{Re}^{\text{VII}}$  (150),  $\text{B}^3$  (145),  $\text{C}_2\text{O}_4^{2-}$  (2000), ascorbic acid (115), citrate ion (2700), tartrates (3500), EDTA (2500). Number of ions interfered the determination:  $\text{Ga}^{3+}$  (1),  $\text{Hg}^{\text{II}}$  (1),  $\text{Tl}^{\text{III}}$  (1),  $\text{In}^{\text{III}}$  (1),  $\text{Fe}^{\text{III}}$  (1),  $\text{Sb}^{\text{V}}$  (1), thiourea (3).

It was studied formation and extraction of  $\text{AuCl}_4^-$  with AEADPA (2-ethoxy-6-(4-*N,N*-propylphenylazo)-9-aminoacridine) and AEADEA (2-ethoxy-6-(4-*N,N*-ethylphenylazo)-9-aminoacridine).

The maximum light absorption of tetrachloroaurate ion ( $\text{AuCl}_4^-$ ) with AEDPA is observed at 520 nm, and with AEDEA – at 515 nm.

The physicochemical and analytical properties of the studied AE and their ionic associates with chloride acido complexes  $\text{AuCl}_4^-$  ( $\lambda_{\text{max}}$ ,  $\epsilon$ ,  $\beta_{\text{KD}}$ ,  $\log K_{\text{ex}}$ ,  $D$ ,  $R\%$ ) were determined.

It was shown that tetrachloroaurate ion ( $\text{AuCl}_4^-$ ) compounds with AE are ionic associates, the molar ratios of the components in which are equal to:



The developed techniques can be used for the extraction-photometric determination of trace amounts of gold in various objects.

**For citation:** Namig I. Ismailov, Sevinj N. Osmanova, Melek M. Agamaliyeva Mekhriban V. Mammadova. Associates of gold(III) with azo-substituted ethoxyacridine. *Butlerov Communications B.* **2021.** Vol.2. No.3. Id.7. DOI: 10.37952/ROI-jbc-B/21-2-3-7

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