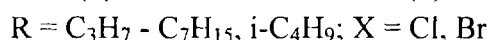
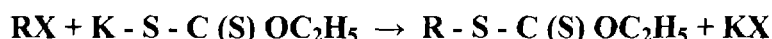


SYNTHESIS, STRUCTURE AND COMPLEX FORMATION PROPERTIES OF ALKYL DERIVATIVES OF ETHYLXANTOGENIC ACIDS

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The representatives of many classes of organic compounds are tested as analytical reactants, in particular, extractants of different metal ions. But majority of investigated substances does not have selectivity in relation to given metal ions. Therefore with the purpose of discovering selective extractants for noble metals, alkyl derivatives of xanthogenic acid are synthesized:



In an IR - spectrum of xanthogenic acid derivatives there are absorption bands of following functional groups (ν , cm^{-1}): ($-\text{CH}_2$, CH_3) 2850-2950, (C-S) 650, (C-O-C) 1030 and 1210.

In a ^1H NMR spectrum of S-butylxantogenate, a quartet of OCH_2 - group, with a constant of a spin-spin interaction $J = 6,6$ Hz, is observed at 4,56 p.m., whereas a triplet of S- CH_2 - group ($J = 6,5$ Hz) is at 3,07 p.m. The protons C- CH_2 of groups (4H) are observed as a multiplet at 1,6-1,7 p.m., and the multiplet signals of CH_3 - group are located at 1,35 p.m. A triplet signal at 0,95 p.m. belong to the three protons of CH_3 - group.

Solving the mass spectrum of S-amylxantogenate has shown that the decay of a molecular ion takes place in different directions and the destruction of C-S - bond causes formation in the spectrum of the most intensive ion with m/z 122 (100 %). The ion $[\text{M} + \text{H}]$ has lower intensity (m/z 193, 26,85 %). Upon decay of an ion m/z 122 the intensive ions with m/z 77 (18,52 %), 89 (74,07 %) and 61 (96,3 %) are formed.

At a mass spectrum of this substance there is also a signal of $[\text{M}-\text{H}] +$ ion (16,1 %). The destruction of C-S -bond causes the formation of the most intensive ion with m/e 122 (100 %). Upon destruction of C-C bond of alkyl chain the ions with m/z 177 (0,5 %) are formed. During fragmentation of a molecular ion the ions with 77 (18,52 %) are formed, and also ions with m/z 89 (44,44 %) and 61 (96,3 %), whose signals are distinguished by high intensity.

As the obtained data show, the efficiency of metal extraction influences the structure of reactant, the concentration and the nature an acid.

The derivatives of xanthogenic acid have shown to be weak extractants of noble metals from acid mediums. The most effective extractants were: S-heptyl - (3,0 M, Au, 64 %) and S-amyl-(1,0 M, Ag, 81,8 %; 3,0 M, Os, 66,7 %) from sulfuric acid medium; and S-amylxantogenate (6,0 M, Ag, 65,5 %) from hydrochloric medium. Branching of alkyl chain ($\text{i-C}_4\text{H}_9$) results in some increase of efficiency of extraction of Au and Ag from acid mediums.

Thus, alkyl derivatives of xanthogenic acid are synthesized and the structure of the obtained substances are confirmed by IR, ^1H NMR, and mass spectrometry data have been studied their complex formation properties in relation to noble metals.