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## Complexation of the alkaline earth metals perchlorates with 3-hydroxyflavone in acetonitrile: precise conductometric treatment

Vira N. Agieienko<sup>a,b,1</sup>, Natalya A. Otroshko<sup>b,c</sup>, Oleg N. Kalugin<sup>b,1</sup>

<sup>a</sup>Laboratory of Advanced Carbon Nanomaterials, Kazan Federal University, 18 Kremlevskaya st., 420008 Kazan, Russia

<sup>b</sup>Department of Inorganic Chemistry, V. N. Karazin Kharkiv National University, 4 Svoboda sq., 61022 Kharkiv, Ukraine

<sup>c</sup>Department of Chemistry, Microbiology and Hygiene of Nutrition, Kharkiv State University of Food Technology and Trade, 333 Klochkivska st., 61051 Kharkiv, Ukraine

**Abstract.** The alternative models of ionic equilibria in acetonitrile solutions of alkaline earth perchlorates in the presence of 3-hydroxyflavone (HL) were studied by conductometry at 288.15, 298.15, 308.15, 318.15, and 328.15 K. Using a procedure specially developed for this task it was shown that in the solutions containing  $\text{Ca}(\text{ClO}_4)_2$  and  $\text{Sr}(\text{ClO}_4)_2$  the complexation of the cation ( $\text{M}^{2+}$ ) by the HL molecule leads to the formation of the doubly-charged  $[\text{M}(\text{HL})]^{2+}$  complex species. In contrast to them, in the presence of  $\text{Ba}(\text{ClO}_4)_2$  HL interacts with the ion pair  $\text{BaClO}_4^+$  forming the singly-charged  $[\text{BaClO}_4(\text{HL})]^+$  complex. The limiting equivalent conductivities as well as the constants of complexation were estimated. The latter were calculated by taking into account the ion association between cation and anion of initial salts and activity coefficients, that is the ‘true’ thermodynamic constants were found. The reliability of the proposed approach was additionally checked by analyzing artificially noised model experimental data. It was shown that the fitted parameters can be satisfactorily reproduced even at the noise level equal to 2%. The limiting equivalent conductivities of the  $[\text{Ca}(\text{HL})]^{2+}$ ,  $[\text{Sr}(\text{HL})]^{2+}$  and  $[\text{BaClO}_4(\text{HL})]^+$  complex species were interpreted in terms of the Stokes radii whose values indicate very weak solvation of the formed complexes. The variation of the constants of complexation among cations was found to be in agreement with the values of primary association constants.

### Keywords:

3-Hydroxyflavone, Alkaline earth perchlorates, Acetonitrile, Conductometry, Ionic equilibria

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<sup>1</sup> Corresponding authors.

Email addresses: [vira.agieienko@gmail.com](mailto:vira.agieienko@gmail.com) (V.N. Agieienko), [onkalugin@gmail.com](mailto:onkalugin@gmail.com) (O.N. Kalugin).

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