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## Areas of crystallization of double condensed phosphates of Ag and trivalent metals and regularities of their formation

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In aim to search for new condensed compounds as well as to study the impact of trivalent and monovalent cations for the formation of inorganic polymer's anionic radicals and the level of condensation, we have studied multicomponent systems containing monovalent and trivalent metals:  $M^I_2O-M_2^{III}O_3-P_2O_5-H_2O$  at  $130^\circ-550^\circ C$  (which  $M^I$  is Ag,  $M^{III}$  – Ga, In and Sc). The double oligo- and cyclophosphates are primarily synthesized and firstly examined by us. General dependency of structural composition and stability of double condensed phosphates from ion radius of  $M^I - M^{III}$  are also examined. Synthesized compounds are investigated and were detailed examined/identified by X-Ray phase's analysis, paper chromatography and thermogravimetric analysis. Analyzing the experimental data shows that we obtained the following condensed phosphates: acidic di- and triphosphates of Ga, In and Sc with silver  $AgSc(H_2P_2O_7)_2$ ,  $AgScHP_3O_{10}$ ,  $AgGaHP_3O_{10}$  and double cyclotetraphosphates  $AgGaP_4O_{12}$ ,  $AgScP_4O_{12}$ ,  $AgInP_4O_{12}$ . It was established the crystallization regions of mentioned phosphates. We can conclude that condensed compounds of scandium-silver, according to their composition and structure, coincide with phosphates of Ga-Na and Sc-Na and are not similar to corresponding compounds of rare earth elements. Moreover it has been discovered that at relatively low temperatures it is more probable to produce double acidic phosphates, with increasing synthesis temperature double tetraphosphates of Ga-Ag, In-Ag and Sc-Ag are formed. Mentioned tetraphosphates are isomorphic among themselves and are iso-structural with the Sodium-Gallium double condensed tetraphosphates. Via comparison of the obtained compounds with appropriate phosphates we conclude that while the radius of trivalent metal decreases, the polyphosphate chain identity period upsurges. The cycles slowly appears, the number of structural types growth is caused by correlation of average distances between ( $M^{III}-O$ ) and ( $M^I-O$ ). It should be emphasized that the various new bio-materials appear on the base of condensed phosphates.

### Biography

Marina Avaliani has completed her PhD from N Kurnakov Institute of Inorganic Chemistry in Moscow. Her Post-doctoral study was executed in Tbilisi State University and is Head of Scientific Themes. She has published 95 scientific papers in reputed journals.

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