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COMPLEXATION OF GALLIUM(III) WITH 1,7-DIAMINO-4-OXYHEPTANE-1,1,7,7-TETRAPHOSPHONIC ACID

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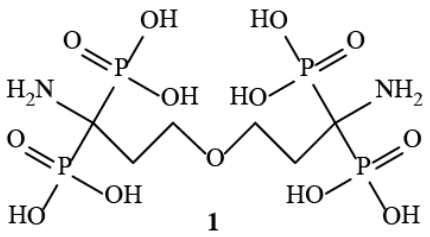
Aminodiphosphonic acids are promising components of radiopharmaceuticals because they can effectively bind cations of diagnostic or therapeutic radiometals and can deliver it to the bones due to their affinity for binding with hydroxyapatite, the main component of bone matrix. ^{68}Ga is one of the popular diagnostic isotope in nuclear medicine. Therefore in this work we study complexation of stabile Ga^{3+} with earlier synthesized 1,7-diamino-4-oxyheptane-1,1,7,7-tetraphosphonic acid 1[1] by potentiometric titration.



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Dissociation constants of 1 and stability constants of its complexes with Ga^{3+} were obtained for the first time. Species distribution diagrams of the protonated forms of 1 and its complexes as a function of pH were plotted. Reaction of Ga^{3+} with 1 at the different pH was studied by NMR. Spectral and potentiometric data were compared. It was found that there are several forms of protonated complexes in solution at pH>8. Moreover, complex predominantly are in the GaH_3L^{2-} form at pH≈6.5. It leads to the formation of three groups of signals in 31P NMR due to the phosphorous atoms nonequivalence.

Literature
1. Tsebrikova G.S., Baulin V.E., Kalashnikova I.P., Ragulin V.V., Zavel'skii V.O., Kodina G.E., Tsivadze A.Yu. Russ. Gen. Chem., 2016, 86, 639.

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