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The study of complex compounds of iron(III)with organic acids

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Abstract

Complex compounds of divalent and ferric ions are of great importance in coordination chemistry. They have found wide application in various industries, inorganic and organic synthesis. Therefore, the expansion of the database on complex iron compounds is topical. In connection with this, in the present work we have studied the instability constants of previously unexplored complex iron compounds. The most common method for studying the properties of complex compounds is photocolorimetric. However, this method does not always make it possible to identify weakly colored solutions of complexes. To study weakly colored solutions of complexes, it is necessary to use other more sensitive methods. Among them, it is necessary to distinguish the conductometric method, which is based on the use of fairly simple equipment. Studies of solutions of complex compounds by the conductometric method are based on measuring the electrical conductivity of these solutions in a short time. In this connection in given work by photocolorimetric and conductometric methods solutions of ferric iron complexes with various organic acids (salicylic, aminoacetic, citric, tartaric, maleic, fumaric, lactic, abietic acids) were studied. The advantage of using the conductometric method in comparison with the photocolorimetric method was established because of the low sensitivity of the latter method in the identification of weakly colored solutions of complexes. The instability constants of these complexes are determined. Complex compounds of trivalent ferric, depending on the nature of the organic acid, have different stability. On stability, complexes on the base on dibasic acids are located in the next decreasing series: iron-salicylic, iron-citric, iron-fumaric, iron- tartaric and iron-maleic. Complexes on the base on monobasic acids are located in the following decreasing series: iron-aminoacetic, iron-abietic and iron-lactic. The data obtained can be used to assess the stability of the corresponding complexes when applied in practice.

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