

METHODS AND CONDITIONS OF SYNTHESIS OF COMPLEX COMPOUNDS WITH AMIDE LIGANDS

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Abstract. This thesis describes the synthesis methods and reaction conditions of complex compounds formed on the basis of amide ligands. The features of the processes of direct complexation, synthesis, hydrothermal and solvothermal methods, and electrochemical synthesis used to obtain complexes are described. The influence of the reaction medium, temperature, solvent type, pH value, and the metal:ligand ratio on complex formation was considered.

Keywords: amide ligand, complex compound, coordination chemistry, synthesis methods, reaction conditions.

Amide ligands contain a functional group -CONH-, which is capable of forming coordination bonds with metal ions through oxygen and nitrogen atoms. Complex compounds formed on the basis of these ligands are characterized by high stability, selectivity, and various physicochemical properties. The properties of complexes directly depend on the method of their synthesis and the conditions under which they were obtained.

There are several methods for the synthesis of complex compounds. For example: direct complexation method, template synthesis method, hydrothermal and solvothermal synthesis, electrochemical synthesis method, pH and solvent medium influence.

The coordination activity of amide ligands depends on pH. In an acidic environment, protonation is observed and the coordination ability decreases. In an alkaline environment, deprotonation occurs, and the bond with the metal intensifies. The synthesis of complex compounds with amide ligands is carried out by various methods. The simplest and most common method is direct complexation, while template and hydrothermal methods are effective in obtaining high-order structures. During the synthesis process, temperature, pH of the medium, solvent type, and the metal-ligand ratio significantly influence the composition, structure, and stability of the complex. Properly selected conditions allow for obtaining pure complex compounds with a high yield.

References:

1. Housecroft C.E., Sharpe A.G. Inorganic Chemistry. 5th ed. - Pearson Education Limited, 2018.
2. Miessler G.L., Fischer P.J., Tarr D.A. Inorganic Chemistry. 5th ed. Boston: Pearson, 2014.
3. Shriver D.F., Atkins P.W. Inorganic Chemistry. 5th ed. Oxford University Press, 2010.
4. Nakamoto K. Infrared and Raman Spectra of Inorganic and Coordination Compounds. 6th ed. - John Wiley & Sons, 2009.
5. Jones C.J. A Practical Guide to Laboratory Safety and Techniques in Inorganic Chemistry. CRC Press, 2002.