

Synthesis and structure of crystallohydrates and ureates of magnesium salts

by
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SUMMARY

In the present thesis, the methods for the preparation of magnesium chlorate, its hydrates and ureates have been reviewed. A laboratory method to produce magnesium chlorate hexaureate free of concomitant inorganic salts has been developed. The relatively simple procedure, without the need for specialized equipment, makes it possible to assume that the method is scalable enough and without any effort it could be used in a large-scale production.

The crystalline structures of two of the hydrates of magnesium chlorate - magnesium chlorate dehydrate, $\text{Mg}(\text{ClO}_3)_2 \cdot 2\text{H}_2\text{O}$, and magnesium chlorate hexahydrate, $\text{Mg}(\text{ClO}_3)_2 \cdot 6\text{H}_2\text{O}$, have been determined.

The crystalline structures of three urea complexes of magnesium salts, i.e. magnesium chlorate hexaureate, $\text{Mg}(\text{ClO}_3)_2 \cdot 6\text{OC}(\text{NH}_2)_2$, magnesium sulfate tetraurea monohydrate, $\text{MgSO}_4 \cdot 4\text{OC}(\text{NH}_2)_2 \cdot \text{H}_2\text{O}$, and magnesium sulfate hexaurea hemihydrate, $\text{MgSO}_4 \cdot 6\text{OC}(\text{NH}_2)_2 \cdot 1/2\text{H}_2\text{O}$, have been elucidated.

In the investigated magnesium ureates and hydrates the coordination number of the magnesium atom is six, and no significant deformation of the coordinating octahedron has been observed.

The studied compounds form a large number of hydrogen bonds that determine the supramolecular structure and stabilize it.

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