



CaCO₃ CONTROLLABLE SYNTHESIS BY DOUBLE EXCHANGE METHOD USING CaCl₂ RESIDUAL SOLUTIONS

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Abstract

The current paper presents the results of a study regarding the controlled synthesis of CaCO₃ by means of the double exchange method. CaCO₃ in various structures and morphologies was prepared by the mentioned method using CaCl₂ and Na₂CO₃ solutions with different molar ratios and temperatures between 30°C and 80°C. In order to define the nature of the solid compounds and the crystallization system, the thermogravimetric, the XRD and the FTIR spectrophotometric techniques have been employed. The general shape of the particles was analyzed by means of scanning electron microscopy SEM. The results of the performed study revealed that the double exchange method can be successfully used for synthesizing precipitated calcium carbonate (PCC), especially when several byproducts resulted from the inorganic chemical industry (residual CaCl₂ solutions) are utilized, but also as a result of the fact that Na₂CO₃ has a relatively low price. According to the technological parameters, rhombohedral particles (calcite, C), hexagonal (vaterite, V) particles and a mixture of rhombohedral and hexagonal particles can be formed. Due to the fact that PCC morphology depends on the working conditions, additional studies have to be performed for determining the influence of temperature, hydrodynamic regime and time on the quality of the synthesized calcium carbonate.

Key words: CaCl₂ residual solutions, calcium carbonate, morphology, synthesis, waste

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