

Production of Carbonates from Removed-K Bittern by Ultrasonic Cavitation Strategy and Application for Phosphor Material

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Summary

The objective of this research is to study the production of carbonates from removed-K bittern by ultrasonic cavitation strategy. We focused on dolomite ($\text{CaMg}(\text{CO}_3)_2$). Dolomite is a double salt in which calcium carbonate (CaCO_3) and magnesium carbonate (MgCO_3) are regularly combined at a molar ratio of 1:1. By using ultrasonic irradiation, it is advantageous that the particle diameter obtained becomes nano-sized. Therefore, the synthesis of nanomaterial from seawater becomes possible. We reported a new synthetic approach to obtain dolomite and report the synthesis of dolomite phosphor as an application material.

The results obtained in this study are summarized below.

- 1) The use of removed-K bittern only did not result in the single phase of dolomite.
- 2) By adding CaCl_2 and adjusting to 0.5 of the Ca/Mg molar ratio, dolomite could be synthesized.
- 3) By immersing dolomite synthesized from removed-K bittern, the phosphor equivalent to dolomite synthesized from a reagent could be prepared.
- 4) By changing the mixing ratio, it was possible to synthesize dolomite phosphors with various emission.