

## Influence of MgO powder addition on thermal decomposition of Mg(OH)<sub>2</sub> to MgO

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MgO has been widely used in many fields such as refractories for cement and steel industries. The raw material of MgO is dolomite or Mg(OH)<sub>2</sub> which was created from sea water. MgO fine crystals grow by heating these raw materials, and this process can be considered as crystal growth of MgO. The initial stage of crystallization is the formation of nuclei of the crystalline phase. Crystal growth, as distinct from nucleation, is the process by which these nuclei attain macroscopic dimensions. Activation energy is required for the formation of the nucleus, and if a small amount of MgO powder is added into the raw materials as the nucleus, MgO crystal may grow easily and eventually the reduction of the heating temperature may be possible because the activation energy for the nucleation is unnecessary. R. Komatsu, one of authors, already demonstrated that the firing temperature for cement clinker can be remarkably reduced by adding a small amount of clinker into the raw material for cement.

In this paper, the influence of MgO powder addition up to 5 mass% on thermal decomposition of Mg(OH)<sub>2</sub> from 653 to 693K was examined, and it was revealed that the content of MgO generated from Mg(OH)<sub>2</sub> greatly increased with the addition of MgO, compared with that in Mg(OH)<sub>2</sub> without addition of MgO at 673K. The microscopic growth behavior of MgO crystal due to added MgO powder has been studied to clear the cause of promotion.

Keywords: MgO, thermal decomposition, crystal growth, activation energy for nucleation