

Influence of Ammonium Nitrate on Crystallization of Norsethite from Aqueous Solution

*Itaru Echigo¹, Harutoshi Asakawa¹, Hiroshi Uneda, Ryuichi Komatsu¹

1. Graduate School of Science and Technology for Innovation Yamaguchi University

Since norsethite $\text{BaMg}(\text{CO}_3)_2$ has birefringence higher than previous piezoelectric and optical crystals, we expect that norsethite can be used as new acousto-optics and wavelength-conversion devices. However, solubility of norsethite is low and it is difficult to control supersaturation. Hence growth of norsethite is difficult. Then, we investigated effects of ammonium nitrate NH_4NO_3 on crystallization of norsethite from aqueous solution. With increasing NH_4NO_3 , solubility of norsethite increased. When concentration of NH_4NO_3 reached to 1M, solubility of norsethite became 30 times larger than without the addition of NH_4NO_3 . With further increasing NH_4NO_3 , solubility of norsethite remained constant. Next, we measured induction periods of norsethite, when 1M NH_4NO_3 was added. Then, we could confirm norsethite just after mixed at 70°C by XRD measurement only in the case of the addition of 1M NH_4NO_3 . Thus, we revealed that the addition of NH_4NO_3 also accelerates norsethite crystallization. This study concluded that addition of NH_4NO_3 is valid for the growth of norsethite.

Keywords: Norsethite, Aqueous Solution Growth, Ammonium Nitrate