

Dawsonite synthesis/dissolution experiment under the relevant condition of CO₂ underground storage

TAKAYA, Yutaro¹ ; NAKAMURA, Kentaro^{2*} ; KATO, Yasuhiro¹

¹Frontier Research center for Energy and Resources (FR CER), Graduate School of Engineering, University of Tokyo, ²Department of Systems Innovation, Graduate School of Engineering, University of Tokyo

Geochemical trapping is a mechanism for defining the longer-term security of CO₂ underground storage. Especially, mineral trapping improves the storage security by the transformation reaction of injected CO₂ (liquid or supercritical phase) to carbonate minerals.

Recently, several studies based on the computer simulation predicted the formations of dawsonite (NaAlCO₃ (OH)₂) as an initial phase of mineral trapping and that dawsonite may play important role for the storage security in the early stage of CO₂ storage. However, it has not been reported the formation of dawsonite in the experiments under the relevant condition of the CO₂ underground storage to date and the problem "whether dawsonite will be formed in the CO₂ reservoir and will contribute the improvement of the CO₂ storage security" is still remaining.

In this study, therefore, we conduct the synthesis/dissolution experiments of dawsonite under the CO₂ reservoir condition and discuss the formation/preservation condition of dawsonite. We further discuss the possibility of dawsonite formation in the CO₂ reservoir based on our experimental results.

Keywords: CO₂ underground storage, mineral trapping, dawsonite