

Phase equilibria of CO₂+N₂ clathrate hydrate in nano size silica gel pore

김대옥, 고동연, 이 혼*
KAIST 생명화학공학과
(hlee@kaist.ac.kr*)

At previous research, a complex of swapping and CO₂ sequestration method to exploit natural gas from deep sea gas hydrate storage region and isolate green house gases to their was proposed. To utilize above technique in industry, we need to collect data such as characteristic of submarine regions, media composed of gas hydrate layer at deep sea, properties of gas injected and kinetic phenomena of swapping reaction, effect of injecting gas on methane hydrate reservoir etc. In present study, we focused on thermodynamic behavior of CO₂+N₂ clathrate hydrate in silica gel. Because CO₂+N₂ is strong candidate as injecting gas and large part of sediments are compose of sands. In this study, we examined the role of porous silica gels as natural sandstone media contained in deep ocean methane hydrate. We also measured the three-phase hydrate (H)-water-rich liquid (LW)-vapor (V) equilibria of CO₂+N₂ gas hydrates in 6.0, 15.0, 30.0nm silica gel pores to investigate the effect of geometrical constraints on gas hydrate phase equilibria.