

Temperature-dependent Raman spectroscopic observation for structural transformation and guest dynamics of gas hydrates and hydroquinone clathrates

박정우, 김병수, 안슬기, 서영록, 윤지호*
한국해양대학교
(jhyoon@hhu.ac.kr*)

Clathrates are crystalline inclusion compounds formed by a physically stable reaction between host and guest molecules. Gas hydrate and hydroquinone (HQ) clathrate are one of the most studied and well-defined clathrate compounds. In this study, guest-free, CO₂-loaded, CH₄-loaded and CO₂/CH₄-loaded HQ clathrates were synthesized by gas-phase reaction and recrystallization. In addition, pure CO₂ and CH₄ hydrates were prepared using a high-pressure reactor. The structural transformation and guest dynamics of the HQ clathrates and the gas hydrates were observed by temperature-dependent Raman spectroscopy. These results provide useful information on the structural integrity and the guest-host interaction of clathrate compounds.