

Temperature-dependent Release of Guest molecules and Structural Transformation of Ar-loaded Hydroquinone Clathrates

우예슬, 윤지호[†]

한국해양대학교

(jhyoon@hnu.ac.kr[†])

Mechanism of chemical reactions can be explored by replacing specific atoms by their radioisotope and tracking the passage of the isotope. ^{41}Ar is useful for industries in nearby locations and lowering the potential radiation hazard due to its short half-life. The β -form hydroquinone clathrate is built up from attractive forces between organic host and guest molecules inside the cages bound by hydrogen-bonded hexagons at the top and the bottom of each cage. In this study, to use β -form hydroquinone as a carrier of Ar, we synthesis the Ar-loaded β -forms HQ clathrates by gas-phase reaction. The temperature-dependent release of Ar molecules from Ar-loaded HQ was evaluated as a function of time by measuring the mass changes of the samples. In addition, High-resolution synchrotron XRD, Raman spectroscopy, and Solid state NMR measurements were used to identify the temperature-dependent structural transformation of Ar-loaded hydroquinone clathrates.