

The most effective sH clathrate hydrate formers

박성민, 신웅철, 이 혼*
KAIST
(hlee@kaist.ac.kr*)

Clathrate hydrates have received much attention for their potential applications involving natural gas hydrate production, energy gas storage and transportation. Among those families, especially structure H hydrates have several advantages because of their distinctive physical and chemical characteristics over others. Structure H hydrate is needed only 1 large molecule per unit cell, which increase storage capacity remarkably. Structure H related researches, finding effective large guest molecules (LGMs) is the most essential and fundamental task. Although many LGMs are reported, there is no molecule showing freely soluble in water. So it has seriously limited more active technological approaches. Here, we report structure H formers showing full miscibility with water. These new sH formers demonstrate the following scientific/technological features : (1) complete miscibility with water, (2) structural stabilization at much milder conditions (3) excellent energy gas storage capacity and (4) other physiochemical characteristics. In this study, XRD patterns and the NMR spectra were obtained to identify their hydrates structure and phase equilibrium data are also presented.