

Thermodynamic stability and spectroscopic identification of binary (*tert*-butyl hydroperoxide + gaseous) clathrate hydrates

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In this study, we identified the structural characteristics of binary *tert*-butyl hydroperoxide (TBHP) + gaseous clathrate hydrates. High-Resolution Powder Diffraction (HRPD), ¹³C solid-state NMR and Raman spectroscopy were used to confirm the structure of binary (TBHP + gaseous) clathrate hydrates. Here, we also investigated the thermodynamic stability of binary (TBHP + gaseous) clathrate hydrates. The experimental data were generated using an isochoric pressure-search method. The dissociation data for (TBHP + gaseous) clathrate hydrates are compared with the other hydrocarbon hydrate and pure gaseous hydrate.