

Phase Equilibria and Spectroscopic Identification of (amines + CH₄) Hydrates with Mole Fraction Change of Host Molecule

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In this study, we introduce a new structure-II hydrate formers, Isopropylamine, Dimethylamine, and Trimethylamine. And we identify the structure and guest distributions through spectroscopic tools including High-Resolution Powder Diffraction (HRPD), ¹³C solid-state NMR and Raman spectroscopy. Here, the (L + H + V) phase equilibrium data of (X + CH₄) hydrates (X = Isopropylamine, Dimethylamine, and Trimethylamine) were also measured at pressures from (5 to 11) MPa. And we change the concentration of host amine(5.56mol%, 4mol%, 3mol%, 2mol%, 1mol%, 0.5mol%), then we get more phase equilibrium data.