

Structural and rheological properties of intercalated methane hydrate(IMH) in Cheto and Otay clays

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In our study we tried to analyze the effect of hydrate formation on structural characteristic of clay minerals when metal hydrate was intercalated in the interlayer space of the two types of clays such as Cheto and Otay. This research was performed by using MAS NMR, RAMAN, LT-XRD, and Cryo-FE-SEM. And we notice that structural stability is maintained during IMH Cheto and Otay formation and IMH otay clay shows much developed methane hydrate morphology than IMH Cheto clays. We are now measuring the phase equilibria of $\text{CO}_2 + \text{N}_2 + \text{H}_2\text{O} + \text{NaCl}$ system at hydrate forming conditions. These phase equilibrium data could be used to apply swapping method to extract natural gas by putting the CO_2 , N_2 mixed gas into the hydrate region of deep-ocean.