
Methane Solubilities in Clay Slurries

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Abstract: Methane solubilities at 25° C were measured at 350, 550, and 750 psia in dilute (<11 wt. %) clay slurries of Na-montmorillonites and argillaceous sediment. Methane solubilities were not significantly affected by the presence of clay. Water hydrated onto the external clay surfaces did not appear to exclude methane. In addition there was no detectable sorption of methane onto the clays. The measured solubilities are consistent with an open structure of the water hydrated onto the clay surface for which the partial molal volume is larger than that of normal water. The results imply that aqueous methane solubilities measured in the laboratory can be used to determine degrees of methane saturation in interstitial solutions in unconsolidated sediments.

Key Words: Adsorption • Interlayer water • Interstitial water • Methane • Montmorillonite • Solubility • Water

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