Methane Hydrate Heat Capacity and Enthalpy of Dissociation Measurements in Bulk and Sediment Systems

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Thermal property measurements of clathrate hydrates in bulk and sediment systems are among the major datasets required to better assess the feasibility of energy recovery from natural hydrate deposits, and in predicting the hydrates' plug dissociation time in deep-sea oil and gas pipelines. High pressure Differential Scanning Calorimetry, HP-DSC, studies have been performed on methane hydrate in bulk and sediment-hosted systems. Methane hydrate was synthesized in situ from granular ice and liquid water in bulk and sediment systems, respectively. Using the DSC technique, direct measurements of the heat of dissociations and heat capacities for these systems have been carried out over the temperature range from 245 to 288 K, which extends these measurements to higher temperatures than those reported in previous measurements. The effect of pressure and temperature on the heat of dissociation and heat capacity values is investigated using HP-DSC.