Experimental analysis for liquid CO_2 replacement in CH_4 hydrate layers

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In order to reduce the released greenhouse gas into the atmosphere, several technologies such as sequestering in the ocean or the subterranean has been studied. Recently result about recovering CH_4 from solid CH_4 hydrate with CO_2 [Lee, et al., Angew. Chem. Int. Ed. (2003)] seems quite attractive. CO_2 in condition of the deep ocean would be liquified due to low saturation pressure (37bar at 3°C). To apply to CO_2 replacement, it is needed to study reaction between two phases (L_{CO2}-H_{CH4}). In-situ reaction for CO_2 replacement in CH_4 hydrates was observed by using Raman Spectroscopy. Composition of liquid CO_2 and hydrates before and after replacement was measured by Gas Chromatography.