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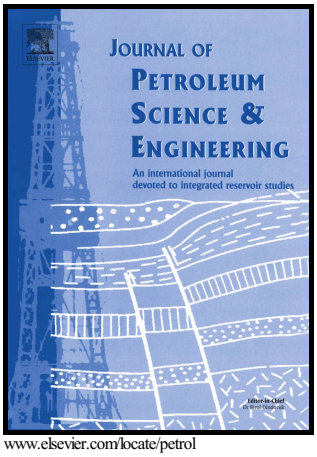

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Investigation on the induction time of methane hydrate formation in porous media under quiescent conditions

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Abstract: The induction time for the formation of hydrates is an important parameter in hydrate-based technology and natural gas hydrate exploitation. The influences of effective factors on induction time are not explained clearly in the current. To obtain data on the induction time for hydrate formation and re-formation processes, experimental studies were carried out for methane hydrates formed in porous media. The vessel used is divided into six compartments of the same size. The temperatures of different regions in the vessel can be measured during experiments. Six T-type thermocouples and a pressure transducer (Nagano Keiki, Japan) were connected to the vessel to measure the temperature (T) and pressure (P), respectively. Forty-eight experimental cycles were performed at 6 MPa and at temperatures from 273.65 K to 276.65 K. The influences of the memory effect, initial water saturation, and hydrate dissociation temperature and dissociation time on the CH_4 hydrate formation/reformation induction time are studied. The experimental results showed that there is a memory effect when the experimental temperature is greater than 275.15 K at 6 MPa and that the memory effect reduces the hydrate formation induction time. Long dissociation times and high dissociation temperatures eliminate

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