HIGH PRESSURE DIFFERENTIAL SCANNING CALORIMETRY

MEASUREMENT OF HYDRATES PHASE EQUILIBRIUM IN

PORE WATER OF SHENHU AREA, SOUTH CHINA SEA

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ABSTRACT

In this paper, we focused on the determination of phase equilibrium conditions of hydrates formed in the pore water from core sediment in Shenhu area, South China Sea. A relatively new technique was applied to this research, which is high pressure differential scanning calorimetry (HP DSC) method. During the study, we first carried out some preliminary experiments to verify the feasibility of the HP DSC method, including nitrogen hydrates and methane hydrates phase equilibrium measurements in water-hydrates-gas (W-H-G) system. Fig. 1 gave the results of the HP DSC measured value compared with reference value. It turns out that they fit each other very well.

![Fig. 1 Nitrogen hydrates and methane hydrates phase equilibrium data in (W-H-G) system](image)

The pore water used in this study is collected by a suction filter from the sample core in Shenhu area, South China Sea. The sampling Voyage is HY4-2006-1, the latitude and longitude is E 115°35.57572’ N 20°02.70441’, and the sampling depth is 1170m. Fig. 2 listed the phase equilibrium points of hydrates in pore water as well as some reference values. Usually, the salinity of sea water is around 3.5%, so based on the phase equilibrium diagram, it can be seen that the hydrates stability is influenced by salinity, higher salt contents make the hydrates dissociation easier. The hydrates in pore water from Shehu area equilibrium temperature is about 2 K below in H₂O at pressure from 10 to 30 MPa.
Fig. 2 Phase equilibrium points of hydrates in pore water, H2O and 14% NaCl solution