**setaram** KEP TECHNOLOGIES

Formation of hydrocarbon gas hydrates

INTRODUCTION

The formation of hydrocarbon gas hydrates is a real problem for gas transportation in gas pipeline : hydrocarbon gases (methane, ethane, propane, butane..) may form hydrates, just by contact of these gases with water, at temperature ranging from 5°C to 12°C. These hydrates having the consistency of a very viscous liquid, the consequence of such a process might be a complete clogging of the pipe.

EXPERIMENT

Sample : 8.03 g of sea water
High pressure flow vessel.
Atmosphere : mixture of methane : CH_4 (95 %) + propane : C_3H_8 (5 %) under a pressure of 65 bar. The gas is bubbling inside the sea water at 2 ml/h.
The temperature is programmed from 25°C down to 0°C at 0.1 K/min.
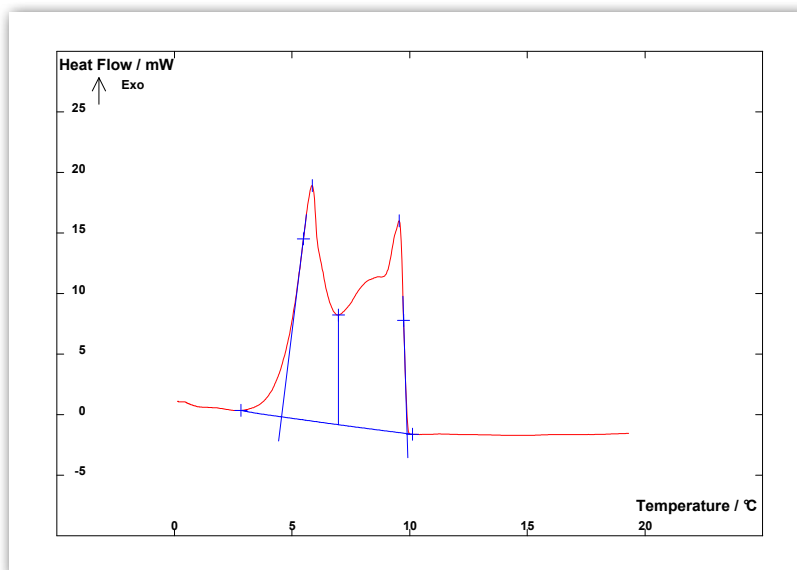
RESULTS AND CONCLUSION

The cooling curve presents different exotherms of formation of hydrocarbon hydrates with an onset temperature of 9.9°C.
They are in fact two main peaks with maxima at 9.6°C and 5.9°C and respective energies of 27.6 J and 26.1 J (the two peak fractions are integrated as shown on the figure).

INSTRUMENT

CALVET CRYO

-196 °C to 200 °C

HIGHEST HEAT MEASUREMENT ACCURACY
3D sensor based on thermocouples with Joule effect calibration

ISOTHERMAL OR TEMPERATURE SCANNING MODES
for increased flexibility and replication of real life conditions

CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS
to perform even the most demanding experiments using one instrument :
• high pressure (1000bar) and high vacuum
• pressure measurement and control
• mixing/stirring experiments

EXTERNAL COUPLING CAPABILITY
designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels

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