EXPERIMENTAL RESEARCHES OF THE MASS-EXCHANGE PROCESSES DYNAMICS IN THE PROPANE HYDRATE SYNTHESIS

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The work is devoted to the experimental studies analysis of various factors influencing the rate of mass transfer processes under the propane hydrate synthesis conditions. For research, the experimental facility has been built (Fig. 1.) that enables to control thermobaric conditions both in the field of hydrate formation and beyond. The working pressure range was 0.1 ÷ 0.5 Maps and the working temperature range was 0 ÷ +12°C.

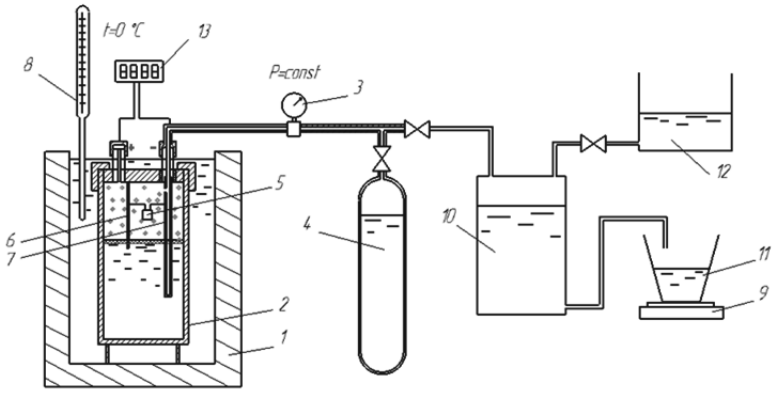

Fig. 1. Installation for the mass transfer during hydrate formation study: 1 – insulated housing; 2 – capacity for high pressure stainless steel; 3 – manometer; 4 – cylinder with compressed (or liquefied) gas; 5 – electronic temperature sensor; 6, 7 – electrodes; 8 – thermometer; 9 – electronic scales; 10 – water displacement tank; 11 – dimensional capacity; 12 – capacity for refueling water; 13 – electronic thermometer

Conclusions. The scientific novelty of the work is in obtaining quantitative dependences of mass transfer intensity on the interfacial surface in the presence of GH. Based on the experimental studies results, a comparison of a low-speed mechanical agitator work and a high-speed agitator has been performed. SAS action mechanism on the hydrate formation rate is determined.

The investigation results practical importance is in determining the gas handler operation quantitative dependencies of various designs on the mass transfer processes speed in the presence of propane hydrate formation. Prospects for further scientific developments in this direction are the gas handler design optimization to obtain smaller gas bubbles.