INVESTIGATION OF PHASE EQUILIBRIUM OF BINARY SYSTEM "NAPHTHALINE-SCF-SOLVENT"

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To simulate, optimize and scale the processes of deep processing of hydrocarbon feedstock using GFR media, reliable phase behavior data of high-pressure mixtures of interest are required, in particular solubility of low-volatile liquid and solid components in the GFR medium. These facts point to the need for reliable data on the phase equilibrium of the systems "GFR medium-hydrocarbon raw materials components".

In this paper, a hydrocarbon of naphthalene was chosen as an oil component. Naphthalene refers to aromatic hydrocarbons. The content of aromatic hydrocarbons in oil varies from 10-15 to 30% (by weight). These hydrocarbons form the basis of heavy oil residues. This involves the choice of naphthalene as an object of research in this work. To study the solubility of naphthalene in the GFR media, an experimental setup has been developed that implements the dynamic method. To test the installation, pilot experiments were conducted to study the solubility of naphthalene in GFR CO2 [1, 2]. A good convergence of the data obtained in this work with literature data was obtained.

The solubility of naphthalene in a GFR propane-butane mixture containing 75% propane and 25% butane [3] was investigated in the pressure range of 5–20 MPa and in the temperature range 373–423 K. The effect on the solubility of the thermodynamic parameters of the process was analyzed.

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1. Amirkhanov D.G. Solubility of substances in supercritical fluid media. / Amirkhanov D.G., Gumerov F.M., Sagdeev A.A., Galimova A.T. / / Ed. Fatherland. Kazan 2014. p.264.
2. Mark McHugh and Mlchael E. Paulaiti . Solid Solubilities of Naphthalene and Biphenyl in Supercritical Carbon Dioxide. J. Chem. Eng. Data 1980, 25, 326-329.
3. Gumerov FM, Farakhov MI, Khairutdinov VF, Gabitov RF, Zaripov ZI, Khabriev I.Sh., Ahmetzyanov TR Increase in the functionality of carbonate rubble by supercritical fluid impregnation with bituminous compounds // Supercritical Fluids: Theory and Practice. -2015. -T.10. - 2.-C. 4-16.