

THE SOLUBILITY OF ANTHRACENE IN SUPERCRITICAL CARBON DIOXIDE

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In the study of phase equilibria, a special place is occupied by such a concept as the solubility of substances, including in supercritical fluids. Knowledge of phase equilibria in systems in a supercritical fluid state is necessary for understanding the broad spectra of processes that form the basis of an innovative technological direction called “supercritical fluid technologies” (SCFT).

Anthracene is one of the main deactivating catalysts of compounds. The subject of this study is the measurement of solubility of anthracene under isotherms 423 K, 435 K, 448 K in the pressure range 9.6 — 22 MPa. The solubility study was carried out on an experimental setup protected by the patent for a utility model [1].

The results of the study showed that the more temperature and pressure increases the more increases the solubility of anthracene. This is due to the fact that an increase in temperature leads to an increase in the pressure of saturated vapors of the dissolvable substance, in consequence of which its concentration in the solvent phase increases. Thus the solubility also increases.

In addition, the solubility of anthracene was described using the Peng — Robinson equation of state and three fitting parameters [2]. Measurement error in describing the solubility results was 7 %.

The solubility results of compounds which deactivate the catalyst determine in a large extent the optimum energy- and resource-saving regimes of catalyst regeneration processes.

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1. The patent for the utility model of the Russian Federation No. 163707 publ. 08/10/2015.
 2. The certificate of the official registration of the computer program No. 2016613119 publ. 03/17/2016.