РЕГИОНАЛЬНЫЕ ЭКОЛОГИЧЕСКИЕ ПРОБЛЕМЫ: ЭКОЛОГИЧЕСКИЙ МОНИТОРИНГ И МЕНЕДЖМЕНТ

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PROCESS OF TWO-PHASE LIQUIDS PERCOLATION THROUGH POROUS STRUCTURES

Nowadays the environmental contamination with oil and its derivatives is recognized as one of the significant and serious issues leading to the irreversible changes in ecosystems and as a consequence, their degradation. Over the last decades, the problem of oil and its emulsions penetration into the soils, as a result of the accidental spilling, drilling processes, and surface runoffs from land-based sources, were actively discussed in literature. However, the process of emulsion penetration in porous structures such as soils and rocks as well as sorptive materials under the action of the capillary pressure was generally left out of consideration.

The main sphere of our research work is the transport of multiphase fluids in different porous media. The purpose of the current report was a process of two-phase liquids penetration through oleophilic/hydrophobic and oleophilic/hydrophilic media. The obtained experimental results allowed to define the dependence between the kinetics of the mentioned process and a set of factors such as the inner phase concentration, the wetting of a sorbing medium with phases of complex liquids, and the nonionic emulsifying agent fraction.

In these experiments, two-phase liquids were represented by stabilized-emulsions with oil ($\eta.\sim56.3\pm0.46$ mPa·s) as the dispersed phase and water as the continuous one. Emulsions were prepared ranging from 10 vol% till 50 vol%. Moreover, they also differed by their concentration of the added emulsifier. Obviously, for oleophilic/hydrophobic porous structures, only dispersed phase behaved as a wetting liquid, while for another medium, both phases were defined as wetting.

According to obtained data, the kinetics of an emulsion penetration in porous medium driven by the capillary suction, depended significantly on the oil/water selectivity of the sorptive material and the emulsifier concentration, especially for highly dispersed emulsions. The heterogeneity of an emulsion percolation can be a consequence of paths obstruction with droplets of the dispersed phase. However, the decrease of the dispersed phase concentration as well as its saturation level was observed with the increase of the height of an emulsion penetration in a sorbent.

The investigated issues are of importance to describe two-phase liquids transport in porous structures and allow to predict their behavior in media with different wettability.

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ПРОЦЕСС ПЕРКОЛЯЦИИ ДВУХФАЗНЫХ ЖИДКОСТЕЙ ЧЕРЕЗ ПОРИСТЫЕ СТРУКТУРЫ

Целью исследований был процесс пенетрации двухфазных жидкостей через олеофильные/гидрофобные и олеофильные/гидрофильные пористые среды. Полученные результаты позволили определить зависимость между кинетикой процесса и такими факторами, как концентрация дисперсной фазы, смачивание пористого материала фазами поглощаемой комплексной жидкости, а также фракция неионогенного эмульгатора.

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ПРОБЛЕМЫ ОБЕССОЛИВАНИЯ ВОДЫ НА ПРЕДПРИЯТИЯХ ТЕПЛОЭНЕРГЕТИКИ РЕСПУБЛИКИ БЕЛАРУСЬ

На крупных объектах теплоэнергетики Республики Беларусь забор воды на собственные технологические нужды осуществляется в большинстве случаев из таких поверхностных источников, как реки и технологические