

Altered surface hydrophobicity of fractionated paraffin wax, crude by-product polyolefin wax and their blend

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By using FT-IR, the surface compositions of crude by-product polyolefin wax (wax K) from a naphtha cracking unit, fractionated commercial paraffin wax (wax J) and their blend (wax M) were compared, under various conditions,. Then a practical criterion was theoretically derived by back-of-the-envelope-calculation to estimate the diffusivity for the surface enrichment of hydrophilic functional groups. The hydrophobicity in terms of chemical structure and functional groups was altered by changing the environment as well as by blending wax K with wax J. The surface properties of wax J and wax M turned out more hydrophobic than that of wax K within the experimental period of water-submerged condition, even though the structure and functional groups on the surfaces of all waxes under ambient atmospheric condition are extremely similar. Under 1 week watersubmerged condition, the values of their diffusivity for wax J, wax K and wax M are estimated as 3.06×10^{-12} cm²/s, 7.23×10^{-11} cm²/s and 1.50×10^{-11} cm²/s, respectively.