In situ, noninvasive characterization of superhydrophobic coatings¹ G.C. TEPPER, M.A. SAMAMA, H. VAHEDI TAFRESHI, M. GAD-EL-HAK, Virginia Commonwealth University — Light scattering was used to measure the time-dependent loss of air entrapped within a submerged microporous hydrophobic surface subjected to different environmental conditions. The loss of trapped air resulted in a measurable decrease in surface reflectivity and the kinetics of the process was determined in real time and compared to surface properties, such as porosity and morphology. The light-scattering results were compared with measurements of skin-friction drag, static contact angle, and contact-angle hysteresis. The In situ, noninvasive optical technique was shown to correlate well with the more conventional methods for quantifying surface hydrophobicity, such as flow slip and contact angle. In situ characterization of submerged hydrophobic surfaces using light scattering represents a new and useful tool for real-time estimation of hydrophobicity and drag reduction.

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