

Sedimentation stability and density of ionic nanofluids

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Stable dispersions of carbon nanotubes in ionic liquids called *ionic nanofluids* (INF) are considered as effective electrolytes for supercapacitors. INF of multiwalled carbon nanotubes (MWCNT) (Sankei goken kogyo Co, Ltd) dispersed in the [C₄mim]BF₄ and [C₄mim]PF₆ ionic liquids were found to be liophobic. After long centrifugation of INF with low MWCNT content at 7000 g the sediment with $w(\text{MWCNT}) = 35\%$ was obtained. The density of INF was measured for the $w(\text{MWCNT})$ from 5 to 33 w/w %. The apparent density of MWCNT in [C₄mim]BF₄ and [C₄mim]PF₆ was found to be (1.811 ± 0.010) and (1.855 ± 0.002) g·cm⁻³, respectively. The apparent density of MWCNT in toluene and water of (2.28 ± 0.07) and (2.17 ± 0.10) g·cm⁻³, respectively, was close to the density of bulk graphite of 2.267 g·cm⁻³. The observed differences can be explained if one assumes that the molecular solvents, unlike ionic liquids, can penetrate into the nanotubes.