

Water-in-oil emulsions stabilized by highly hydrophobic layered zinc phenylphosphonate particles

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Highly hydrophobic layered particles (water contact angle $>120^\circ$) of anhydrous zinc phenylphosphonate were synthesized by the hydrothermal method with pH between 5.5 and 6.0 [1]. The characterization of these nanoparticles was performed by XRD, FTIR and SEM/EDS. XRD indicated a material with high crystallinity and basal distance of 14.40 Å, FTIR presented the characteristic bands of the P-O bonds and the aromatic ring and SEM the layered particles, confirming the success in the synthesis. Emulsification capacities were determined by macroscopic observations, optical microscopy and fluorescent confocal laser scanning microscopy (CLSM) on water-vaseline emulsions varying the concentration of particles (0.1-1 wt%) and the oily fraction (0.3-0.7). The particles of zinc phenylphosphonate showed high emulsification capacity and high stability against coalescence (up to 20 days), suggesting that the particles led to a reduction in the interfacial energy of the system [2]. Phase separation occurred at 5760 minutes for 0.3 vaseline fraction, at 2880 minutes for 0.5 vaseline fraction, and at approximately 180 minutes for 0.7 vaseline fraction. It was also possible to observe that the emulsified portion was greater with the increase in the concentration of particles and with the increase in the water fraction used.

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