Surface-tailored Carbon Dots Surfactants for Water-in-oil Emulsion

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Carbon dots (CDs) have been considered as effective surfactants for emulsion stabilization due to their low toxicity, biocompatibility, and excellent optical properties. Although CDs have extraordinary potentials as efficient surfactants, previously reported emulsions stabilized by CDs are mainly oil-in-water(O/W) emulsions due to strong hydrophilic character of CDs. From the perspective of interfacial science, facile tuning of surface property of CDs may lead to develop protocols for fabricating functional emulsion-based templates. In this study, we precisely tailored the surface property of CDs during the synthesis of CDs and demonstrated surface-tailored CDs for stabilizing water-in-oil(W/O) emulsions. Surface property of CDs was carefully characterized using contact angle measurements. Furthermore, the effect of CDs concentration and volume fraction of oil and water on the emulsion stability was investigated in detail.
Keywords: Carbon dots, Water-in-oil emulsion, Pickering emulsion, Surfactants