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Surface Functionalized Carbogenic Quantum Dots A.B. BOURLINOS, NCSR "Demokritos", Greece, A. STASSINOPOULOS, A. ANGLOS, S.H. ANASTASIADIS[1], Foundation for Research and Technology-Hellas, Greece, R. ZBORIL, Palacky Univ., Czech Republic, M. KARAKASSIDES, Univ. of Ioannina, Greece, E.P. GIANNELIS, Cornell Univ. — Surface functionalized carbon-based quantum dots (C-QDs) are formed in-situ in a single-step process via thermal carbonization of suitable molecular precursors based on ammonium citrate salts. The as-synthesized nanoparticles have near spherical morphology and size around 7nm. Using different surface modifiers, we can form hydrophobic or hydrophilic capped C-QDs, which can be dispersed in organic or aqueous solvents, respectively. These C-QDs fluoresce strongly upon optical excitation. We believe that the fine size of the C-QDs combined with their disorder structure favor a high concentration of defect sites at the surface of the nanoparticles that, upon stabilization by the attached organic groups, give rise to the observed emissions. It is further noted that the emission band shifts to shorter wavelengths as the excitation is blue-shifted. In a series of studies, the emission quantum yield of C-QDs was found to be around 4%. These types of materials are promising as fluorescent tags for biological application. Sponsored by the ULF-FORTH (Laserlab- Europe) and by the Greek GSRT.

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