

Advanced study of photoluminescent carbon quantum dots photophysical behavior

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In this work, we aimed to synthesize novel carbon nanomaterials known as Carbon Quantum Dots and to study their photophysical behavior. Thus, we fabricated carbon quantum dots through well-known and newly developed high-pressure solvothermal synthesis pathways that were optimized using structural characterizations such as XPS, TEM imaging, FTIR, and Raman spectroscopy. After adequate purification, the carbon quantum dots were studied through saturation fluorescence correlation spectroscopy and very low-temperature photoluminescence measurements to further our understanding of their fluorescence mechanisms. By linking those measurements with the previously obtained structural characterizations, we were able to understand the photophysical mechanisms underlying the photoemission of these nanoparticles.

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