

Synthesis of luminescent nitrogen-doped carbon nanoparticles using Microwave microplasma

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Fluorescent Nitrogen-doped carbon nanoparticles have attracted attention due to its widespread applications in optoelectronic devices as well as biomedical application. The synthesis of carbon nanoparticles with nitrogen doping was done using a Microwave (MW) microplasma in the presence of hydrogen, methane, and nitrous oxide. The synthesized particles were analyzed using Raman spectroscopy to confirm the formation of fluorescent nanodiamonds along with the sp² phase of carbon. The Photoluminescence spectra confirm the significant presence of fluorescent N-doped carbon nanoparticles. The presence of nitrogen is confirmed from is well studies using X-ray photoelectron spectroscopy. The morphological features were confirmed by SEM. Significantly formation of core-shell N-doped carbon nanoparticles were observed after the samples were annealed at 550 °C. These results and the formation of the core-shell structure of N-doped carbon nanoparticles are discussed in the poster.

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