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3<sup>rd</sup> World Congress and Expo on

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# **Graphene & 2D Materials**

November 26-28, 2018 | Barcelona Spain

# Green chemical route: enhanced photocatalytic degradation of malachite green under UV irradiation using Ag/g-C3N4 composite

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S ilver-graphite carbon nitride (Ag/g-C3N4) was designed and synthesized through a simple and cost effective green chemical route. Structural and morphological features of the Ag/g-C3N4 photocatalyst was comprehensively characterized by Fourier transform infra-red (FT-IR), X-ray diffraction (XRD), high-resolution transmission microscopy (HR-TEM), energy dispersive X-ray spectroscopy (EDS) and X-ray photoelectron spectroscopy (XPS) and the specific surface area was calculated from Brunauer-Emmett-Teller (BET) analysis. The HR-TEM and XRD results indicate that the synthesized Ag nanoparticles, spherical like nanoparticles with an average size of ~6 nm were randomly loaded on the surface of g-C3N4. Graphitic carbon nitride (g-C3N4) is a well-known semiconductor material with a graphite-like layered structure. It has been used extensively in electrochemical water splitting and as a photocatalyst for hydrogen generation and pollutant degradation due to its band gap energy (~2.7 eV), high thermal and chemical stability, non-toxicity, easy preparation, abundance, and environmental benignity. In addition, the Ag/g-C3N4 nanocomposites exhibited 2.5 times higher photocatalytic activity than pristine g-C3N4 for the degradation of malachite green (MG) dye under UV-light irradiation.

### **Recent Publications**

- 1. Vattikuti S V P (2018) Tiny MoO3 nanocrystals self-assembled on folded molybdenum disulfide nanosheets via a hydrothermal method for supercapacitor. Materials Research Letters 6:432.
- 2. Nagajyothi P C (2018) Green synthesis, characterization and anticancer activity of yttrium oxide nanoparticles. Materials Letters 5: 58–62.
- 3. Vattikuti S V P (2018) Hydrothermally synthesized Na2Ti3O7 nanotube–V2O5 heterostructures with improved visible photocatalytic degradation and hydrogen evolution-Its photocorrosion suppression. Journal of Alloys and Compounds 740:574–586.
- 4. Nagajyothi P C (2017) Enhanced photocatalytic activity of Ag/g-C3N4 composite. Separation and Purification Technology 188:228–237.
- 5. Pandurangan M (2017) Renal-protective and ameliorating impacts of omega-3 fatty acids against aspartame damaged MDCK

### Biography

P C Nagajyothi received her PhD in Environmental Science from SV University, India, in 2008, under the supervision of Professor T Dhamodharam. After five years of Postdoctoral Research experience at Hanyang and Dongguk University, South Korea, she joined in College of Mechanical Engineering, Yeungnam University, South Korea as International Research Professor. Her research interest is in green synthesis of metal and metal oxide nanoparticles, and their biological and photocatalytic applications.

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