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Azido ester functionalized graphene oxide for energetic application

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Over the past decade, the discovery of Graphene a two-dimensional (2D) carbon structure has gathered a lot of attention due to its unique properties, including extraordinary mechanical properties, electrical, thermal conductivity etc. In spite of possessing unusual properties, its low solubility and poor reactivity have limited its use and created a major challenge that must be addressed for future application. In order to overcome these problems, several strategies are explored all over the world. Our first approach is to synthesize graphene oxide (GO) by the chemical treatment of graphite through oxidation and further exfoliation in water. Based on the literature survey we have envisaged functionalizing Graphene oxide with azido ester. It is known that when explosives groups such as nitro, azido, and triazole are incorporated into materials, it enhances the energetic properties. The Graphene oxide functionalized azido-ester will be prepared from esterification of Graphene Oxide (GO) by azido based alcohol. For evaluation of synthesized products, different techniques like XRD (X-ray diffractometer), FT-IR (Fourier transfer infrared spectroscopy), TGA (Thermo-gravimetric analysis), XPS (X-ray photoelectron spectroscopy), elemental analysis, NMR (Nuclear magnetic resonance), SEM (Scanning electron microscope) and TEM (Transmission electron microscope) are used. We will study the effect of it on other available energetic composite materials by evaluating energetic and mechanical properties such as calorific value, burn rate, viscosity etc. and envisioned vital enhancement.

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