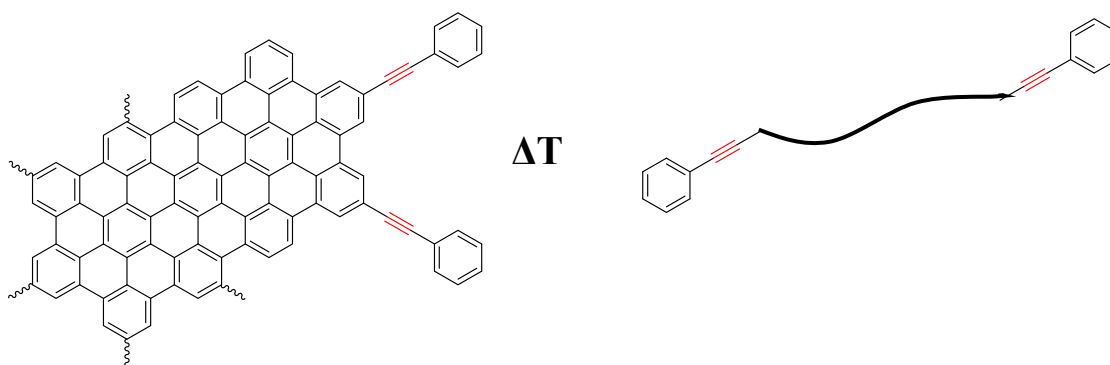


Phenylethynyl functionalized nanographene and their post-processing cured polyimide composites

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Herein we describe a novel phenylethynyl functionalized nanographene synthesized via a bottom-up approach and its use in the preparation of reinforced polyimides. Nanographene combined polyimides are a highly investigated class of materials with superior mechanical properties. Current materials are mostly based on blend formations [1]. To obtain uniform blends with a fine dispersion and miscibility a strong interfacial interaction between the nanographene and the polyimide is essential. Hence a functionalized nanographene was approached in which the polyimide was end capped with the same thermally curing phenylethynyl groups [2]. Both synthesized compounds were heat treated resulting in a crosslinked material. Based on initial thermal and mechanical experiments it seems that the obtained material shows improved properties compared to commonly prepared nanographene-polyimide blends opening new interdisciplinary applications in various fields.



[1] J. Longun, J. O. Iroh, Nano-graphene/polyimide composites with extremely high rubbery plateau modulus, *Carbon*, **2012**; 50: 1823–1832.

[2] C. M. Thompson, P. M. Hergenrother, Aryl Ethynyl Terminated Imide Oligomers and Their Cured Polymers, *Macromolecules*, **2002**; 35: 5835–5839.