Graphene oxide nanosheets as fillers for thermoplastic-matrix nanocomposites

Reference	Presenter	Authors (Institution)	Abstract
02-034	Bianca Sanches Santos	MOURA, E.A. (INSTITUTO DE PESQUISAS ENERGÉTICAS E NUCLEARES); Santos, B.S. (Instituto de Pesquisas Energéticas e Nucleares); Ishikawa, O. (Instituto de Pesquisas Energéticas e Nucleares); Santana, J.G. (Nuclear and Energy Research Institute); Bartolomei, M.R.(Instituto de Pesquisas Energéticas e Nucleares); Oliveira, R.R. (Nuclear and Energy Research Institute);	Recent studies have shown that the synthesis of graphene oxide (GO) by chemical oxidation of graphite followed by its reduction is one's the most promising routes to prepare remarkable polymer/graphene nanocomposite materials with significant improvement of properties compared to the base polymer. The addition of a very small amount of reduced graphene oxide (RGO)in a polymer can enhance its properties, with respect to electrical conductivity, barrier resistance, stiffness, abrasion resistance, mechanical resistance, and fire retardancy. Numerous approaches have been established to prepare RGO from the desoxygenation of GO. This work presents the synthesis of graphene oxide by chemical oxidation of graphite followed by its photoreduction in aqueous dispersion using UV radiation and highlights some examples of RGO/thermoplastic-matrix nanocomposites prepared by melt processing. To evaluate the potential application of thermoplastic composites prepared, the RGO's content on the morphological, mechanical and thermal properties of the as-obtained nanocomposites has been assessed. In addition, GO/RGO nanosheets were characterized by ATR–FTIR, XRD, Raman, and FE-SEM. According to the results, it can be inferred that the addition of RGO leads to a remarkable improvement in the performance of thermoplastic-matrix nanocomposites and offers a competitive solution for various potential applications.