

Graphene Materials-based Composites with Multifunctional Properties

Julio Gomez^a

Elvira Villaro,^b Javier Perez^a

a) AVANZARE INNOVACION TECNOLOGICA S.L.
Avda Lentiscas 4-6. Navarrete. Spain.

b) INTERQUIMICA. Antonio de Nebrija 8.
Logroño. Spain

julio@avanzare.es

The application bulk graphene materials in composites is the largest market for graphene, followed by energy storage [1]. Several reviews analysed the applications of the different graphene and related products in composites.[2, 1b]

Graphene materials (GRM) are a big family of materials with remarkable differences in morphology, dimensions, aspect ratio, surface chemistry, etc. An adequate selection of the GRM and processing technique is a key factor for achieves the desired properties. Also, and adequate nomenclature and standardized or industrial accepted characterization techniques are needed for the application and avoid lost of efforts and resources.

In this presentation we will compare the influence of the various graphene materials prepared by different methodologies, from LPE to oxidation/reduction, with variations in lateral size, dimension and surface chemistry and processing technologies for the preparation of composites in the final properties of the composites.[3,4] The possibility to obtain electrical and thermal conductivity, mechanical performance and fire retardancy allows to prepare multifunctional composites. Different strategies and results for the production of graphene multifunctional composites will be presented.

References

- [1] a) Zh Ma, R. Kozarsky, M. Holman., GRAPHENE MARKET UPDATE. LUX RESEARCH (2014). b) Ferrari A Cet al Nanoscale, 7, (2015), 4598-810 c) M. Peplow, Nature, 522, 268, (2015)
- [2] a) P Samorì, I A Kinloch, X Feng and V Palermo, 2D Mater. 2, (2015) 030205 b) R. J. Young, I. A. Kinloch, L. G., Kosty. S. Novoselov, Composites Science and Technology, 72, (2012) 1459-1476,
- [3] J. Gomez, I. Recio, A. Navas, E. Villaro, B. Galindo, A. Ortega-Murguialday, J. Appl. Polym. Sci., 136 (2019), 47220
- [4] A. Elmarakbi, P. Karagiannidis, A. Ciappa, F. Innocente, F. Galise, B. Martorana, F. Bertocchi, F. Cristiano, E. Villaro Ábalos, J. Gómez, Journal of Materials Science and Technology (2019) in press.

Figures

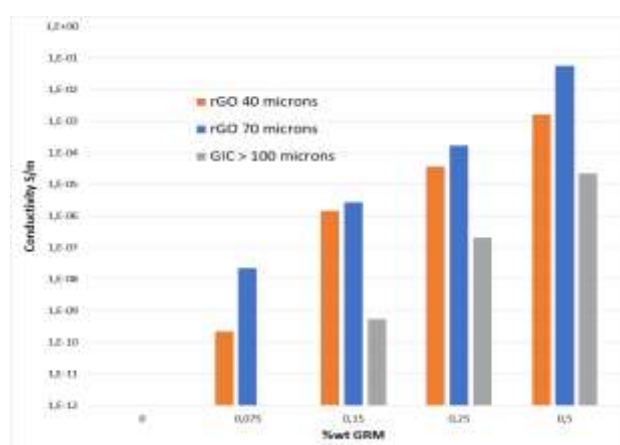


Figure 1: Influence of GRM in the electrical conductivity of an epoxy matrix composite