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Comparison of electrical behavior of different carbon fillers as a tool to predict final composite behavior

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Carbon materials are used in polymer composites to tune their properties (electrical, mechanical and thermal). Besides the traditional carbon fillers like carbon black, nanotubes and graphene biochar have been recently considered. Biochar is a carbon rich material derived from the pyrolysis of biomass. Interest on this material is due to its low cost and its great availability. Biochar perspective as a filler has been investigated by comparing its impact on composite properties to that of more expensive carbon fillers. Here we focus our attention on the electrical performance of such composites. The assessment of the electrical conductivity of the carbon filler is actually, together with its shape and aspect ratio, a good predictor of the final composite behaviour. Here we report a series of measures on the conductivity of different carbon materials in powder form. Biochar will be compared with traditional carbon filler from the electrical point of view (conductivity) and its advantage/disadvantage will be discussed in the optical of final composite performance.

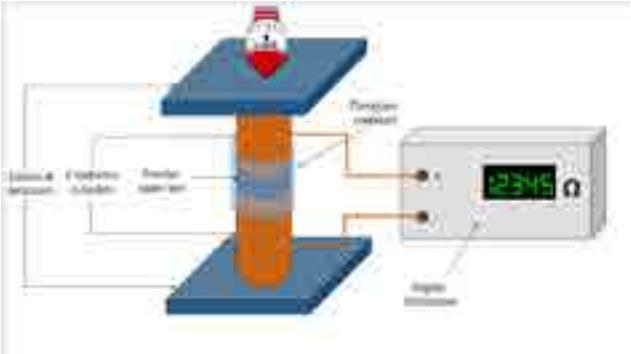

Fig.1 Set up for conductivity measurements for carbon filler in powder form.

Biography

Mauro Giorcelli holds a master in electronic engineering and a PhD in physics and is currently enrolled as a researcher at Department of Applied science and Technologies (DISAT) at Politecnico di Torino. He has published over 50 articles in international journals and those have received over 500 citations. He is a carbon material specialist, in particular in composites materials. Recently he has started to work also in the field of low cost carbon materials, in particular, carbon materials derived from biomass (Biochar). He has a widespread collaboration network in Europe, Asia and Canada for biochar applications.

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