Reduced Graphene Oxide with Enhanced Degree of Reduction and Exfoliation for CO_2 Capture

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Abalonyx is a partner of a Horizon 2020 project entitled "CARMOF" in which aims to combine the advantage of physical and chemical adsorbents in a hybrid structures composed by functionalized MOFs, and rGO for CO2 capture[1].

CO2 capture process represents typically about 70% of the total cost of the carbon capture and storage (CCS) chain. One of the most promising technologies for CO2 capture is based on the adsorption process using solid sorbents. As a member of this family, the metal–organic frameworks (MOFs) are well recognized for their extraordinary surface area, ultrahigh porosity, and most importantly the flexibility to tune the porous structure as well as the surface functionality. For more efficient utilization of MOFs sorbents, several hybrid systems based on MOFs with other solid sorbents have been investigated in order to utilize the synergism between the two sorbents and therefore ultimately improve the overall performance in CO2 separation. Moreover, sorbents such as activated carbons, reduced graphene oxide (rGO) and Carbon nanotubes (CNTs) provide the added feature of high surface area and easily functionalized sites, which contribute to the tuning of the final properties of the composite material. The rGO is an important carbonaceous functional materials that has attracted considerable attention owing to its high aspect ratio, high mechanical strength, unique electrical properties, and chemical stability.

In this work, we present some parts of the results obtained for synthesis of rGO through thermal heat treatment to obtain high degree of reduction and exfoliation.

References

[1] https://carmof.eu/

Figures

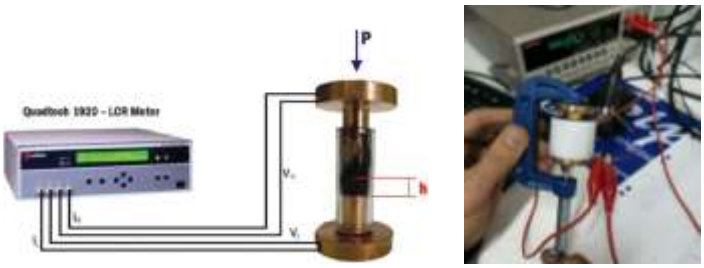

Figure 1: Set up used for measuring the electrical conductivity of powdered materials under low/moderate compression.

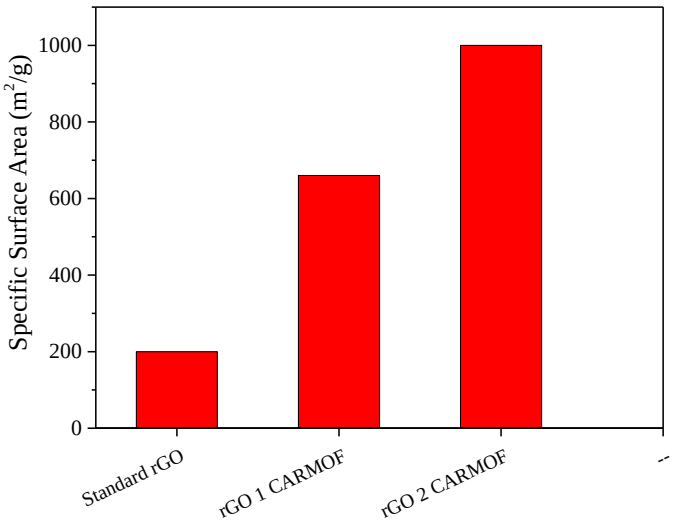

Figure 2: The specific surface area for indicated materials