

Study of AgO Nanoparticles in graphene bilayers by Raman Spectroscopy

A. **Champi**^{1#}, M. Briones² and M. Quintana²

¹Centro de Ciências Naturais e Humanas, Universidade Federal do ABC – 09210-170, Santo André, SP, Brazil.

²Universidad Nacional de Ingeniería, P.O. Box 31-139, Av. Túpac Amaru 210, Lima, Perú.

#Corresponding author: ana.champi@ufabc.edu.br

The silver oxide nanoparticles (AgO Nps) used in this study was obtained by laser ablation technique. On the other hand, graphene bilayers were obtained through micro mechanic exfoliation. Both techniques are considered clean, simple and they have economic viability. The analyses have showed a positive charge in nanoparticles and alteration in Raman spectra caused by doping in the bilayer observing the appearing of D band. The alterations in the Raman spectrums are related with the introduced defects in the crystalline chain after the nanoparticles incorporation on bilayers, they may be associated with atomic substitutions, because the silver atoms and ions have a bigger atomic radio which can cause punctual substitution defects. However, we have been doing a systematic study about the Raman laser output in graphene bilayer and in graphene bilayer doped with nanoparticles and only graphene bilayers. These measurements have shown a clear difference to both cases. The distance between defects has been showing to be inversely proportional to the ratio I_D/I_G in the analyzed cases, (increasing or lowering the incident light output), with this it was possible to handle the defect distances in the case of AgO nanoparticles/graphene bilayers. Finally, we analyzed the ratio of the integrated area of D and G band, finding the existence of a direct relationship between defects distance, the areas ratio and defects density as a function of laser output.