Probing electron dynamics in ozone-doped graphene by Raman spectroscopy

H. Tao[(a)], J. Moser[(a)], **F. Alzina[(a)*]**, Y. Yamila[(a)], A. Bachtold[(a)], and C. M. Sotomayor-Torres[(a),(b)]
[(a)] CIN2 (Institut Català de Nanotecnologia-Consejo Superior de Investigaciones Científicas), Campus UAB, 08193 Bellaterra (Spain)
[(b)]Institució Catalana de Recerca i Estudis Avançats (ICREA), 08010 Barcelona (Spain)
* francesc.alsina .icn@uab.cat

Graphene linear carrier dispersion in the vicinity of two inequivalent points (**K**, **K**') of the Brillouin zone creates the conditions for the occurrence of unusual effects on the dynamics of both electrons (holes) and phonons, which are related to the electron-phonon interaction [1-4]. Sequential ozone short-exposure cycles increase the *p* doping of the graphene sheets, as concluded from both the position and the intensity of the Raman peaks. The dynamics of the photoexcited electron-hole pairs has been proven in graphene by the two-phonon Raman peaks intensity. We could determine the electron-phonon coupling for the phonon modes near the **K** point, and to monitor the electron-electron scattering contribution with increasing charge concentration as well as with the number of graphene layers. Nevertheless the Raman spectra show the typical features related to different degrees of bond disruption and disorder at high ozone exposure.

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