

Graphene enhanced Raman scattering on single and double layer of pristine and hydrogenated graphene

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Hydrogenated graphene is a promising material that has a huge potential in sensors; both amperometric and photonic. In this work we focused on the analysis of hydrogenated graphene enhanced Raman scattering performance. Specifically, graphene enhanced Raman scattering on isotopically labelled double layer and single layer of pristine and partially hydrogenated graphene has been studied [1]. We focused on the comparison of different peaks of the Rhodamine 6G probe molecules, which enabled us to explain our results without determining the enhancement factor and assuming homogeneous coverage of the molecules [2]. Hydrogenated graphene sample showed a difference in relative intensities of Rhodamine 6G peaks on single layer and double layer graphene, respectively. The difference was qualitatively explained by different doping of graphene in both areas. Pristine graphene sample exhibited no difference in doping nor relative intensities of Rhodamine 6G Raman peaks in single layer and double layer areas. However, this fact enabled us to conclude that strain and strain inhomogeneities do not affect the GERS mechanism. Furthermore, even the comparison between pristine and hydrogenated graphene samples validated the theoretical expectations.

References
