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Atomic Force Microscopy In High Vacuum: Experiments On Graphitic Surfaces

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Atomic Force Microscopy (AFM) working in high vacuum (HV) conditions is a valuable technique due to its sensitivity and versatility. In this work we present different experiments in carbon-based materials. We use the HV-AFM to perform different experiments on graphitic surfaces like graphene and graphene oxide (GO). Graphene can be described as one-atom thick layer of graphite. For many applications, the interaction of graphene and GO with the supporting substrate and with adjacent layers plays a relevant role in properties such as adhesion, charge transfer [1], doping level etc. Furthermore, it is important to take into account the presence of atmospheric contaminants for a correct interpretation of experimental data [2]. Finally, we have studied the influence of a pressure difference onto the mechanical properties of suspended graphene membranes [3]. We have studied the diffusion through these membranes as a function of the kinetic diameter of the gas molecules [4] (Figure 1).

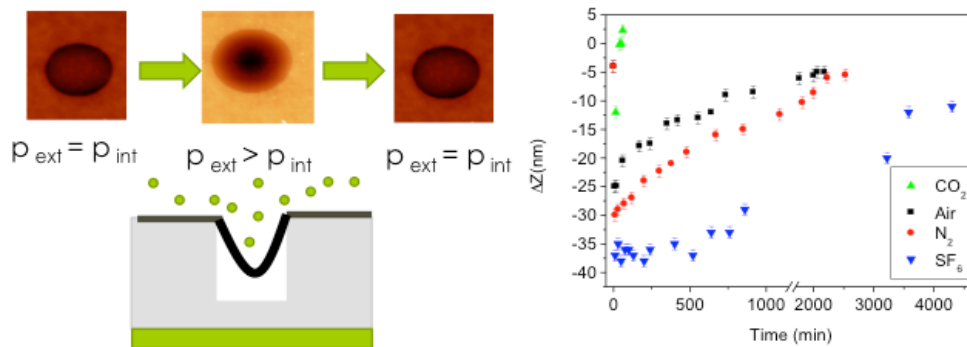


Figure 1. Suspended monolayer of graphene as a selective gas barrier.

M. Jaafar et al. Appl. Phys. Lett. 101, 263109 (2012)

D. Martínez-Martín, et al. Carbon 61 33–39 (2013)

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