EFFECT OF GAS EXPOSITION ON BI-DIMENSIONAL MATERIALS: GRAPHENE AND SILICENE.

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Epitaxial graphene on SiC present a 2D honeycomb structure which induce some spectacular properties. Recently, we have observed the first experimental evidence of another 2D honeycomb structure: silicene nano-ribbons deposited on metallic surface. However the graphene is a zero band gap semiconductor and the silicene presents a strong metallic character on silver. One of the key issues for these materials for technological applications is the control and opening of the band gap. Following this way, we studied the interaction of atoms, such as H and O, with these 2D materials using scanning tunneling microscopy and spectroscopy (STM/STS), low energy electron microscopy (LEEM) and angular resolved photoelectron spectroscopy (ARPES). In this talk we will show the effect of these exposures on electronic properties with a spectacular decoupling of the graphene sheets while its band gap is opened and the oxidation process of silicene nano-ribbons.