C-based nanostructures on Ag(110). What do we learn by XPS?

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Graphene-based nanostructures and 2D carbon-based networks are at the forefront of research for the possibility to control their electronic and chemical properties by acting on their size/morphology and by suitably doping them [1]. Therefore, they are considered a promising and low-cost substitute of metal-based catalysts in several reactions of environmental interest.
I will revise our recent results in this field, focussing on the role of XPS analysis in understanding of the chemistry of the system.
I will report on the synthesis and characterization of C-based 1D and 2D nanostructures on Ag(110), highlighting the role of the aromatic precursor molecule to obtain nanostructures with the desired properties [2,3]. In case of graphene nanoribbons, I'll discuss the stability towards atmospheric gases, showing that oxygen exposure deeply affects the overall system by interacting both with the nanoribbons and with the substrate. This factor must be considered for use under operative conditions. [4]. For Pd-cyclometallated, I'll show that a complex surface chemistry takes place, leading to molecular fragmentation and, possibly, to the occurrence of cross-coupling reactions between the organic fragments [5,6].

References

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