

FEW-LAYER BLACK PHOSPHORUS FUNCTIONALIZED WITH METAL NANOPARTICLES: FULL CHARACTERIZATION AND CATALYTIC ACTIVITY ON HYDROGENATION REACTIONS

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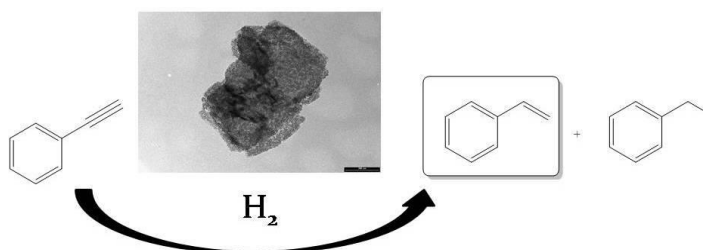
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Black Phosphorus (BP) is an allotropic form of phosphorus with a layered structure similar to graphite¹. Thus can be exfoliated (or down to the monolayer) and represents one of the most credible successor to graphene, with potential applications in electronics, photonics, photovoltaic, sensing and catalysis fields¹. In our labs good quality few-layer BP were prepared by liquid exfoliation through sonication of bulk-BP in dimethylsulfoxide². Our aim will be the study of the chemical functionalization of this 2D-material with organic and inorganic species. In particular, metal nanoparticles of nickel, palladium, gold and ruthenium were anchored on 2D-BP surface and new nanocomposites were isolated and characterized by TEM, AFM and XPS. Preliminary studies, using the composite NiNPs/2D-BP as catalyst for the hydrogenation of phenylacetylene were performed and good activity and high selectivity toward styrene have been observed. Further investigations on electronic properties of these new materials in comparison to pristine 2D-BP, are also ongoing.



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References:

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