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Heterostructures Based on Functionalized Graphene and Free-standing Graphene Membranes

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ABSTRACT

Functionalization of 2D materials enhances potential for application of these materials. Here, we propose a strategy for resist free lithographical approach for localized functionalization of graphene using photochemically modulated reaction. It will be shown how controlled functionalization can be applied to optimize function of supercapacitor in graphene/PANI composite. Furthermore, I will discuss preparation of active graphene membrane by deposition of cerium oxide nanoparticles using pulsed laser deposition in ultra-high vacuum conditions and a systematic study of the influence of preparation conditions on ceria nanoparticles and their interaction with CVD graphene. Finally, the influence of graphene membrane on cerium oxide catalytic properties towards methanol will be discussed.

