

SUPERHYDROPHOBIC / SUPEROLEOPHILIC HIGHLY FLUORINATED GRAPHENE OXIDE AND ZIF-8 COMPOSITES FOR OIL-WATER SEPARATION

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Abstract

A convenient methodology has been established for fabrication of superhydrophobic/oleophilic composites based on highly fluorinated graphene oxide (HFGO) and nanocrystalline zeolite imidazole framework (ZIF-8). The structure directing properties of HFGO allow for selective nucleation of ZIF-8 nanoparticles over oxygen functionalities. Furthermore, the composite microstructure features pendant fluorine groups bonded at the graphene basal plane. A unique micro-mesoporous architecture is achieved, where the micropores originate from ZIF-8 nanocrystals, while the functionalized mesopores from randomly organized HFGO layers with ZIF-8 pillars. During my presentation I will highlight the exceptional superhydrophobic (water contact angle 162°) and superoleophilic (oil contact angle 0°) properties of the HFGO@ZIF-8 composites. In addition to that modified Sponge@HFGO@ZIF-8 composites are successfully utilized for oil-water separation.

Keywords: Fluorographene, Zeolite imidazole Frameworks (ZIFs), superhydrophobic / superoleophilic materials, oil-water separation, highly fluorinated graphene oxide (HFGO)

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