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Super- hydrophobic and super-lipophilic functionalized graphene oxide/polyurethane sponge applied for oil/water separation

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Super- hydrophobic and super-lipophilic functionalized graphene oxide/polyurethane sponge applied for oil/water separation[☆]

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Abstract: Nowadays, oil spills have led to a serious environmental crisis of the world. To deal with this problem, inspired from super-hydrophobic lotus leaf, this study fabricated super-hydrophobic and super-lipophilic functionalized graphene oxide/polyurethane (FGP) sponge by a simple and inexpensive dip coating method. The resulting FGP sponge was characterized by infrared spectroscopic, X-ray diffraction, scanning electron microscopy and water contact angle. The results expressed that FGP sponge exhibited similar surface structure of lotus leaf, and possessed the super-hydrophobic characteristic with the water contact angle (WAC) of $(152\pm1)^{o}$. The absorption capacity and reusability were also investigated. It can be seen that, the FGP sponge can remove a wide range of oils and organic solvents from water with good absorption capacities (up to 35 times of its own mass). Significantly, after 10 cycles the absorption capacity of the oils and organic solvents was high than 90% for the reused FGP sponge, demonstrating the good reusability of the FGP sponge. Therefore, this study probably provided a simple way to remove the pollutions of oil spills and toxic organism from water.