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**Surface Modification of Porous Substrates for Oil/Water Separation using
Crosslinkable Polybenzoxazine as An Agent**

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Abstract

Efficient separation of both immiscible and emulsified oil/water mixtures is achieved by collaborating polybenzoxazine (PBz) with commercially available substrates in this work. Possessing intrinsic low surface energy, crosslinked PBz coating endows various substrates (sponges, filter paper, and ceramic membrane) with surface hydrophobicity and oleophilicity and enables oil-selective penetration. The as-prepared sponge (CR-PBz-sponge) could effectively remove oil floating on water and oil under water with high absorption capacities (up to 120 times its own weight) and good recyclability. The PBz-coated filter paper (CR-PBz-filter paper) is applicable to efficient large-scale oil/water separation based on its high fluxes (about 5000-6000 Lm⁻²h⁻¹) on a wide range of organic solvents and oils. CR-PBz-ceramic membrane shows great effectiveness in removal of tiny water droplets from water-in-oil emulsion and reduces the water contents of the treated oil to the levels of the natural water solubility of the oils. Based on its separation efficiency, processing simplicity, substrate versatility and low cost, the technique of using PBz as coating

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