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A novel Cu(OH)<sub>2</sub> coated filter paper with superhydrophobicity for the efficient  
separation of water-in-oil emulsions

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**Abstract:** A novel filter paper (FP) with superhydrophobicity and superoleophilicity was prepared via adsorption and immersion process for the separation of surfactant-stabilized water-in-oil emulsions. The realization of superhydrophobicity with a water contact angle of 153° benefits from the Cu(OH)<sub>2</sub> nanostructure formed on FP and subsequent stearic acid (STA) modification. The three-dimensional network of FP as well as superhydrophobic and superoleophilic property can facilitate the demulsification of emulsified oil, thus the only gravity-driven separations of various water-in-oil emulsions with high oil flux and good recyclability have been achieved. The superhydrophobic FP can be massively applied in emulsion separation due to its facile preparation and superior performance.

**Keywords:** Surfaces; Cu(OH)<sub>2</sub>; Microstructure; Superhydrophobicity; Water-in-oil emulsion

### 1. Introduction

With the increasing discharge of oily wastewater and oil spill accidents, the separation of emulsified oil/water mixtures, especially surfactant-stabilized emulsions, has become an urgent problem since they cause serious damage to environment and human survival [1,2].

Superhydrophobic materials have been extensively applied for oil/water separation, such as metal

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