Hydrophobic Porous Mesh (HPM) for Fast Oil-Water Separation

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Abstract:

Oil pollution as a result of oil production/transportation has become one of the most important global environmental problems. In the most recent incident in January 2018, million barrels of hydrocarbons spilled in the East China Sea. Due to adverse environmental pollution and ecological problems of an oil spill, effective separation of oil from water is of significant importance globally. Hydrophobic and oleophilic porous meshes/fabrics have attracted attention from both academia and industry due to their simplicity, low-cost, and efficiency.

For effective oil-water separation, there is a need for a porous membrane/mesh with large pore size distribution. In this study, the concept of using a hydrophobic porous cage to separate and collect oil from the surface of water is proposed. The cage can be made out of hydrophobic mesh/fabric with large pore size to separate/collect oil quickly. The separated oil can be continuously pumped out to another reservoir and this will reduces the cost of separation to minimum.

For producing hydrophobic porous mesh, various techniques will be tested such as wet chemical surface modification, and electrospinning. Physical-Chemical properties of these meshes, and their oil-water separation efficiency will be investigated by various techniques.