# POPLAR FIBER AS A NATURAL FIBROUS SORBENT FOR OIL-WATER SEPARATION

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**Abstract:** Natural fibers that are abundant, low-cost and biodegradable have broad potential applications in the range of oil absorption and oil/water separation. Of them, fibers with hollow structure and waxy surface, such as kapok, milkweed and poplar fibers, were mostly used to clean up oil spills [1-4]. In this study, diesel oil was examined to evaluate the potential of poplar seed hair fiber as an oil sorbent material. Poplar exhibits exceptional features including high hydrophobic–oleophilic property and large lumen (as shown in Figure 1). Critical parameters such as surface static contact angle and oil-water separation efficiency are examined. Poplar fibers demonstrate outstanding hydrophobic properties with a static contact angle of 151°, while exhibiting excellent lipophilicity with a static contact angle of 0° against engine oil. It is found that poplar fibers show an exceptional oil-water separation performance to remove oil from contaminated wastewater. This study presents a promising bio-based solution for mitigating water pollution caused by oil spills and other accidents, offering a low-cost, environmental-benign, and efficient approach. Moreover, poplar is a natural and biodegradable fiber that offers ease of disposal after use without causing harm to the environment.

***Keywords:*** *oil-water emulsion, separation, diesel oil, sorption capacity, poplar*

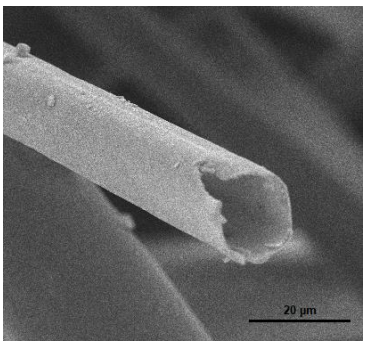


**Figure 1** SEM image of hollow poplar fiber.

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