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Efficient oil-water separation using femtosecond laser processed meshes followed with vacuum treatment SHARJEEL KHAN, GANJABOY BOLTAEV, RASHID GANEEV, ALI ALNASER, American Univ of Sharjah — Surface structuring by femtosecond laser can alter the wetting behavior and generate micro/nanostructures with high resolution, which can find application in oil-water separation. Superhydrophobic-superoleophilic and superhydrophilic underwater-superoleophobic membranes/meshes, which we analyze in present study, are two ways to realize oil-water separation. In order to alter the wettability to superhydrophobic-superoleophilicity chemical functionalization is commonly desired, while we suggest the femtosecond pulses induced modification of surface properties. In this study surface structuring of metal meshes using 35 and 300 fs pulses yields superhydrophobic-superoleophobic structuring by utilizing a novel technique of post-ablation processing in vacuum during a few hours. Stainless steel and copper meshes are structured with laser and their oil-water separation efficiency is measured by gravity driven separation in which oil passed through the mesh repelling the water.

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