Microfiltration of Oil-in-Water Emulsions using Porous Membranes

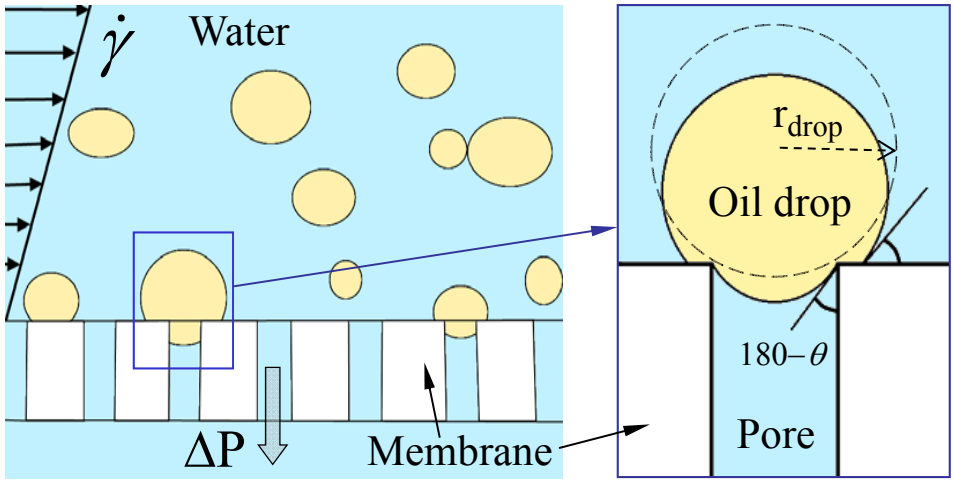
• An application-driven project relevant to oil spill remediation, water purification and produced water treatment processes.

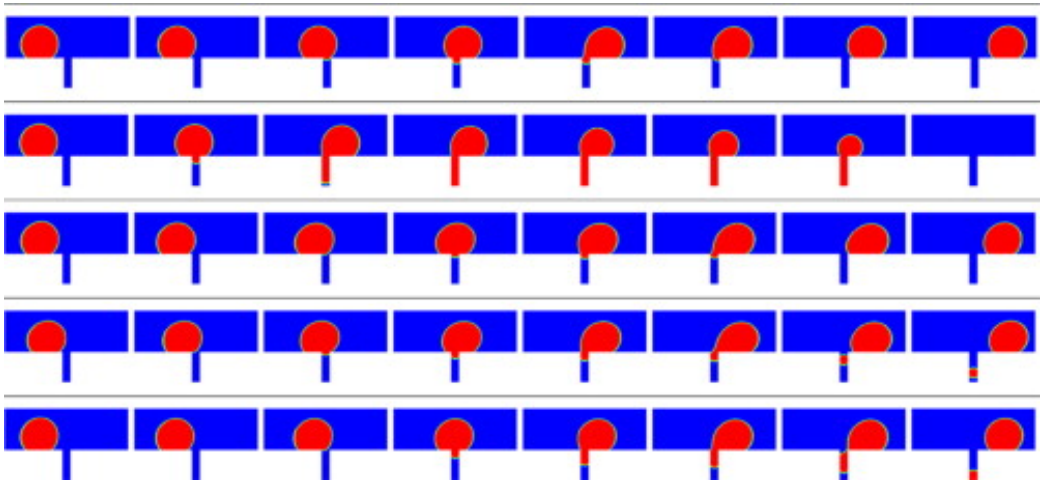
• The goal is to separate dispersed oil phase from water using porous membranes.

• In a recent study, we determined numerically the phase diagram for the droplet rejection, permeation, and breakup depending on the transmembrane pressure and shear rate.†

• In the future, develop a numerical model that can be used to guide the experimental design of porous filters (pore geometry, materials, and operating conditions).

• In collaboration with the Environmental Nanotechnology group at Michigan State University (Prof. V. V. Tarabara).





† T. Darvishzadeh, N.V. Priezjev, "Effects of crossflow velocity and transmembrane pressure on micro-filtration of oil-in-water emulsions", *Journal of Membrane Science* **423**, 468 (2012) and *JMS* (2013).