

Singapore Stanford Partnership Programme

MS Project MS08-23

Modifying Reverse Osmosis and Nanofiltration Membranes by Surface Coating

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The performance of composite reverse osmosis (RO) and nanofiltration (NF) membranes are determined by an ultra-thin rejection layer. Optimization of this critical layer to achieve superb fouling resistance and rejection efficiency becomes a high priority research area, driven by the increasing popularity of membrane water purification.

In the proposed project, non-fouling polymeric materials will be used to modify the rejection layer of RO and NF membranes, and to enhance and optimize their flux, rejection, and fouling resistance. Rejection and fouling performance will be evaluated and compared with commercially available membranes based on batch-scale fouling experiments. Natural organic matter (NOM) and proteins, ubiquitous in RO and NF feedwater, may be used as model foulants. Rejection performance may be evaluated based on salt and trace organic transmission through the membrane. Membrane characterization and autopsy will be carried out by microscopic and spectroscopic methods.