



Fig. 1. (A) Schematic illustration of the MLD process. (B) 15°-tilted SEM of TFC membrane made with 90-cycle MLD TMC-MPD polyamide film on polyethersulfone (PES) support. (C) Polyamide thickness as a function of MLD deposition cycles for TMC-MPD (top) and TMC-PIP (bottom) films, measured on Si wafers using ellipsometry. (D) *In-situ* quartz crystal microbalance measurements on mass gain of TMC-MPD (top) and TMC-PIP (bottom) in 80 cycles. (E) Pure water permeance and NaCl salt rejection of TMC-MPD TFC membrane as a

function of MLD film thickness. **(F)** Pure water permeance and MgSO_4 salt rejection of TMC-PIP TFC membrane as a function of MLD film thickness.