

Supporting Information

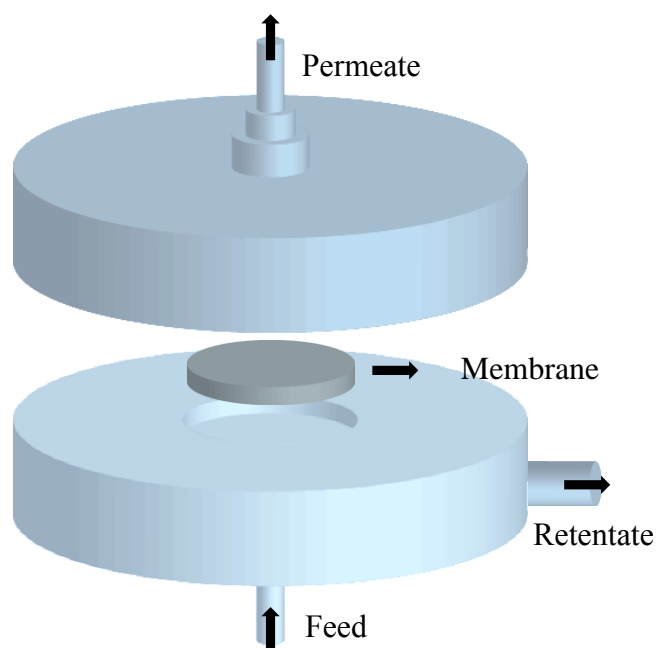


Figure S-1a. The illustrative drawing of the NF cell used in this study.

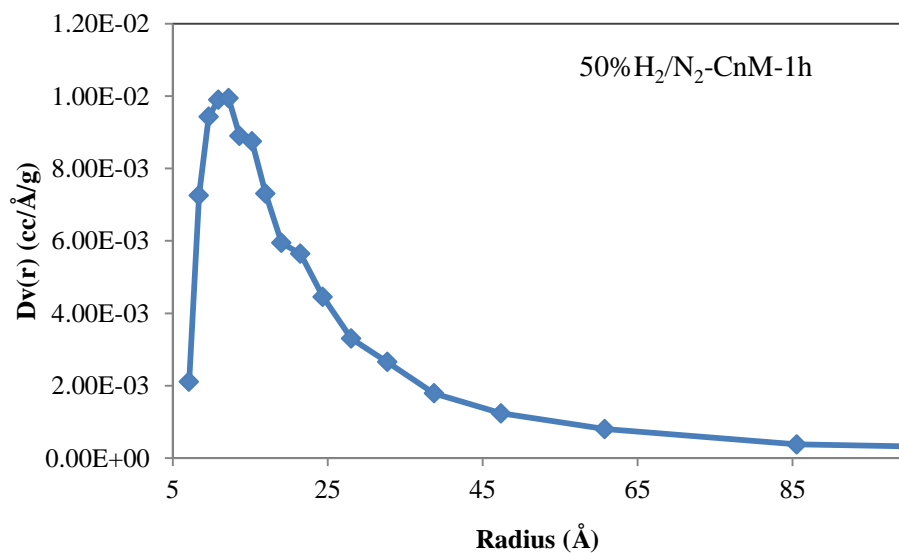


Figure S-1b. Pore size distribution curve of 50% H₂/N₂-CnM-1h.

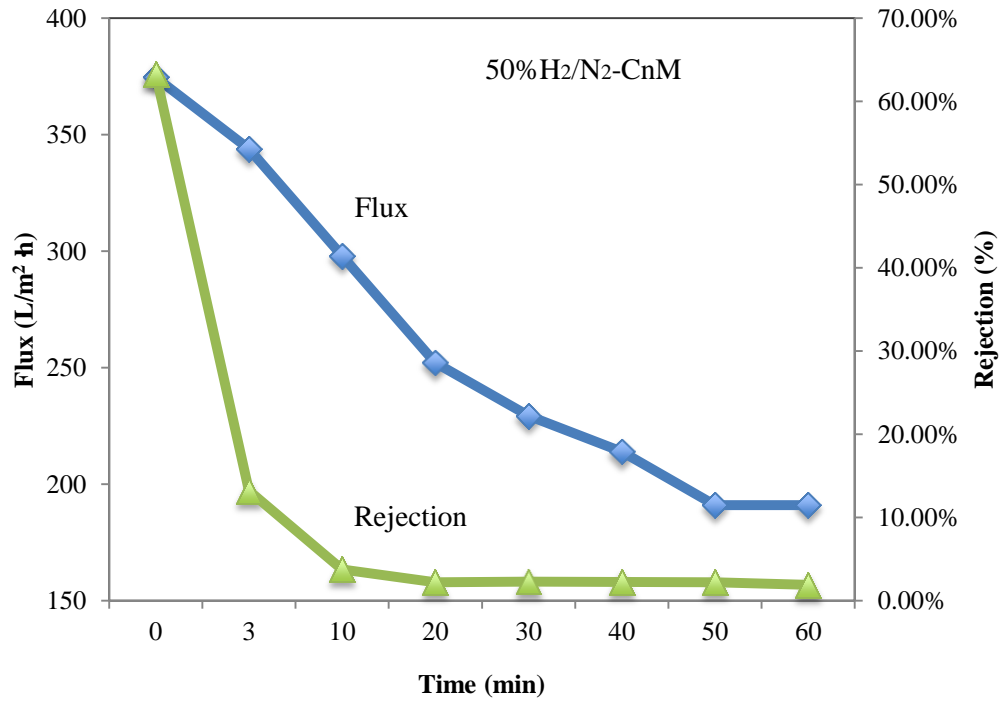


Figure S-1c. The permeation flux - filtration time and rejection-filtration time profiles of the surrogate MB solution (10 ppmw) at 24 bar through the supported 50% H₂/N₂-CnM.

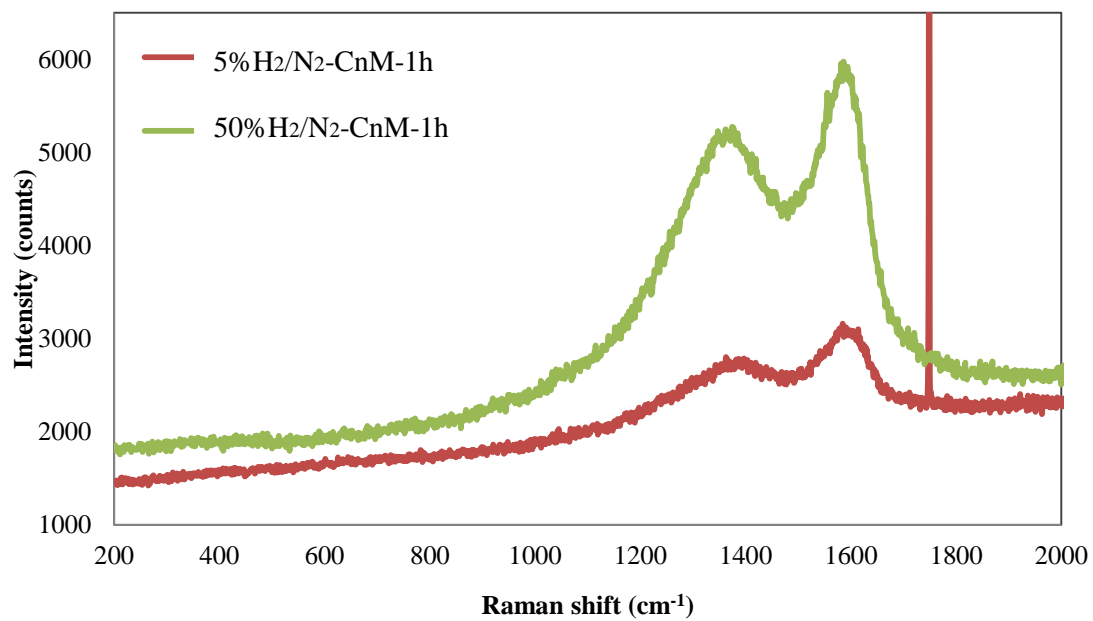


Figure S-2 Raman spectra of 5% H₂/N₂-CnM-1h and 50% H₂/N₂-CnM-1h

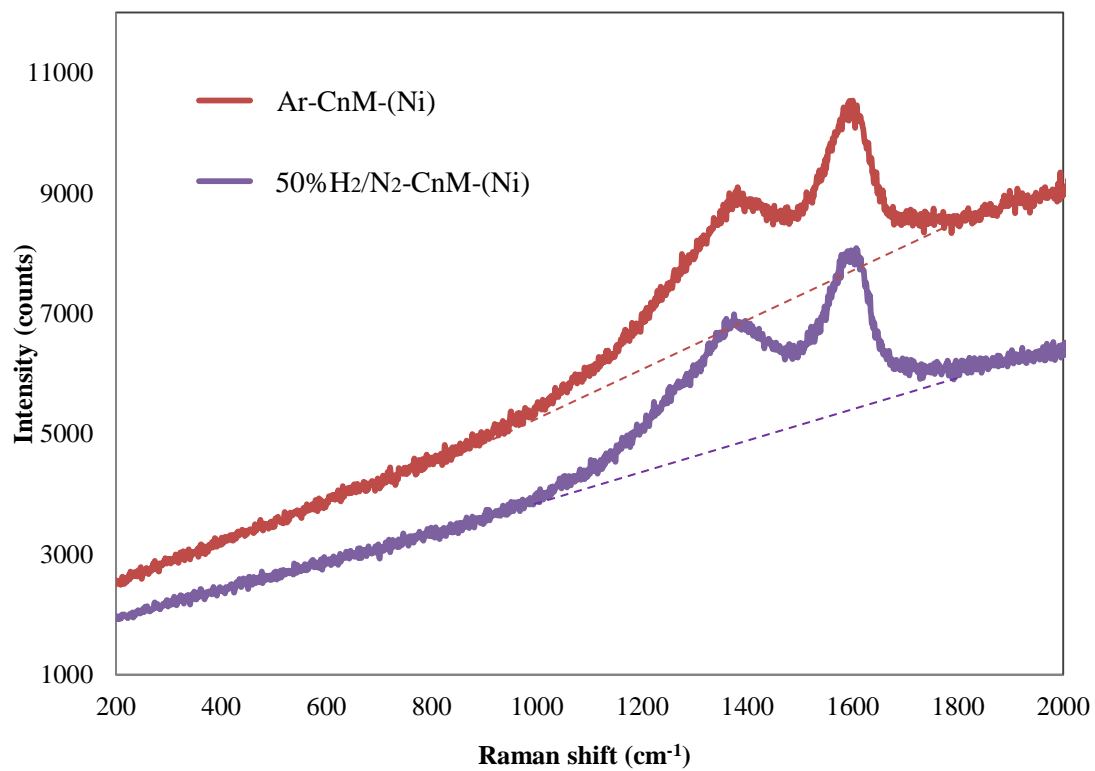


Figure S-3 Raman spectra of Ar-CnM-(Ni) with $\frac{I_D}{I_G} = 0.7$ and 50% H₂/N₂-CnM-(Ni) with $\frac{I_D}{I_G} = 0.74$.

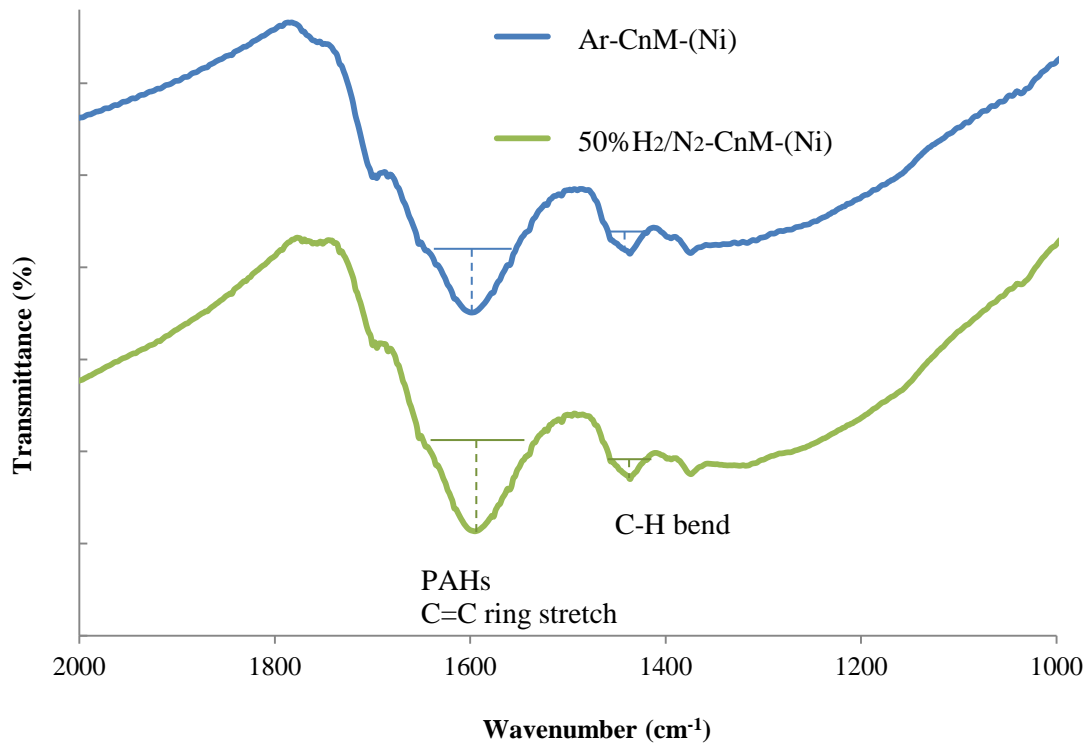
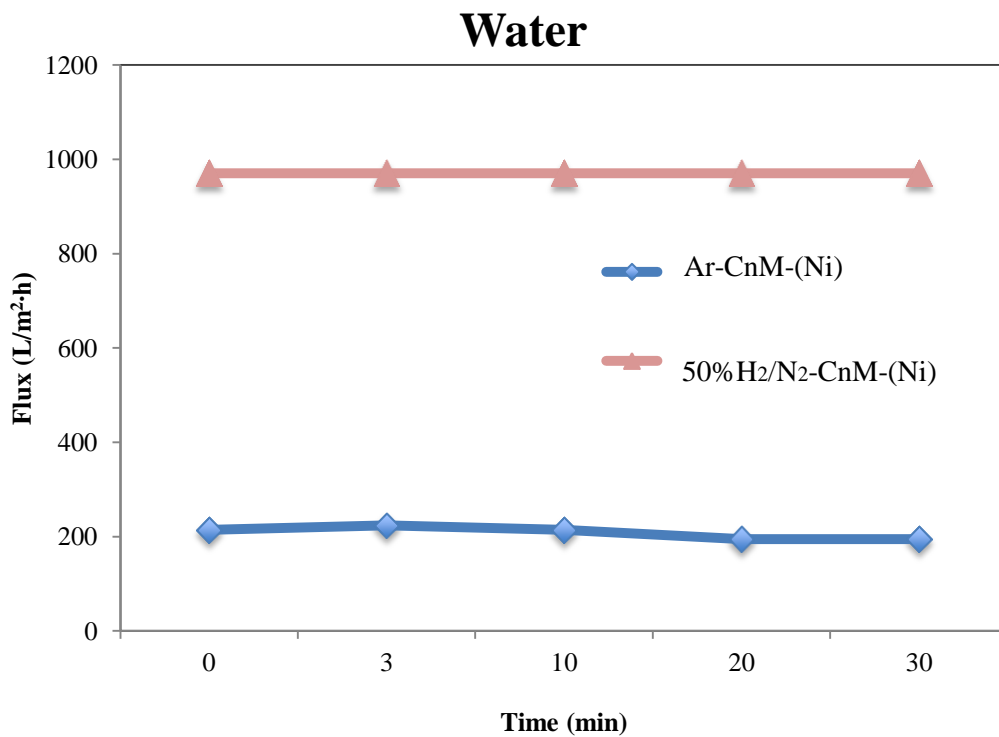


Figure S-4. Comparison of infrared spectra of 50% H₂/N₂-CnM-(Ni) with Ar-CnM-(Ni)



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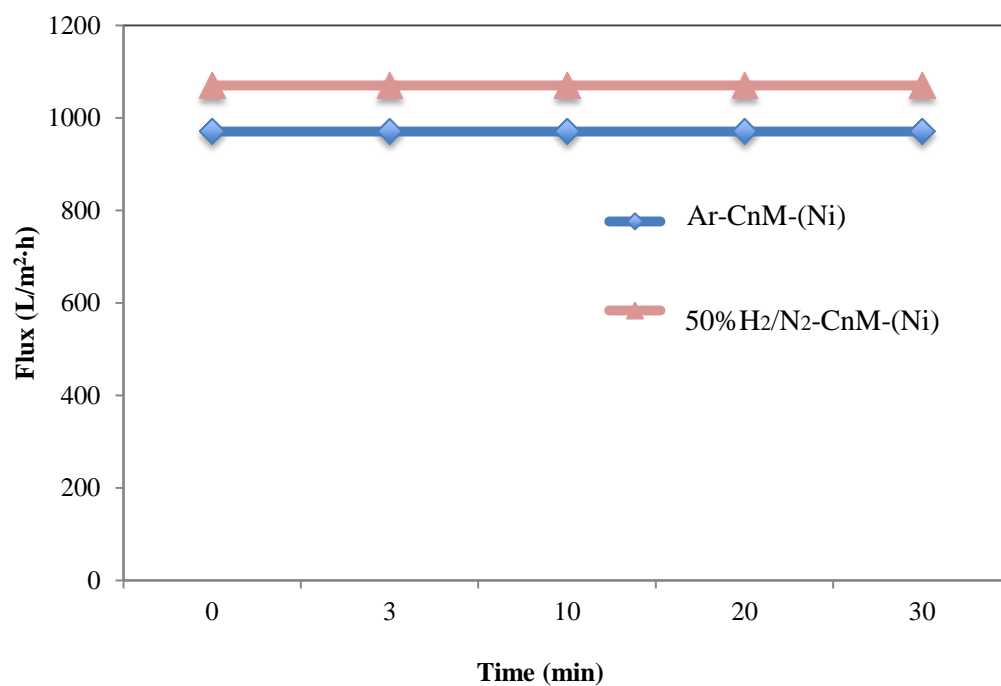


Figure S-5. Comparison of hydrophilicity of nanopore channels in the two selected CnMs, Ar-CnM-(Ni) and 50% H_2/N_2 -CnM-(Ni).