Condensation and Evaporation of Hexane in Nanoporous Alumina Membranes

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Overview

Context

Grand scheme

- Condensation and evaporation of fluids in confinement

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- Dependency on
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Plan

- Anodized alumina membranes (AAM)
- Test setup using Hexane $\rightarrow$ working at room temperature permits much faster executable experiments
- Transfer to **helium** experiment

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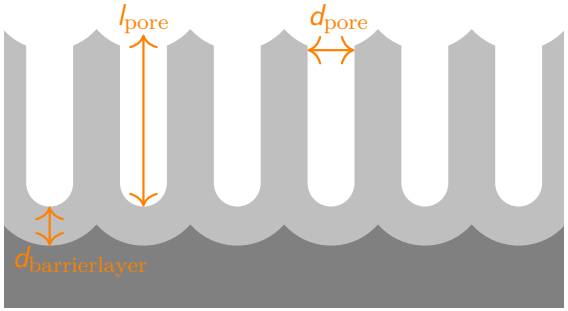
- Performing isotherm measurements on many membranes for **statistics**
- Comparing the pore diameters extracted from the volumetric measurements those from scanning electron microscopy (SEM) images
- Improving the fabrication process to reduce the dispersion
- Testing the efficiency of the ALD process as a means to reduce the pore diameters

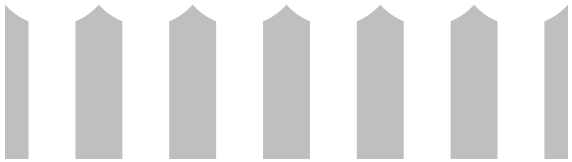
Membrane production

Two step anodizing
in oxalic acid
($C_2H_2O_4$) at 0 °C

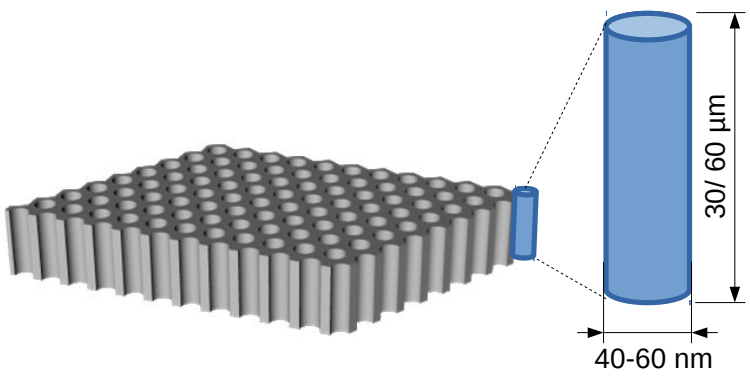


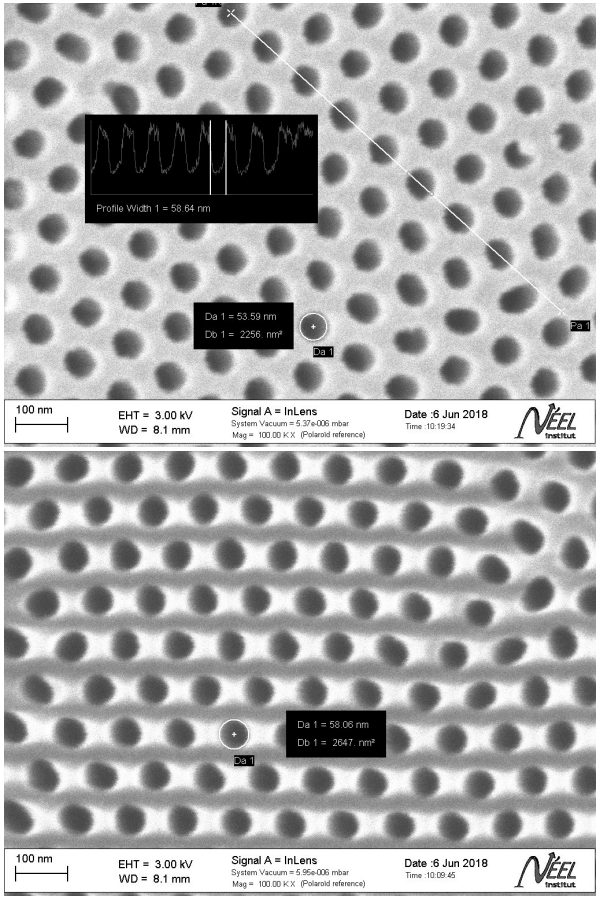
Immersion in
$\underbrace{27.2\,g \quad CuCl_2}_{\text{copper chloride}}$
$+\underbrace{0.2\,l \quad HCL(37\,\%)}_{\text{hydrochloric acid}}$
$+\underbrace{0.8\,l \quad H_2O}_{\text{water}}$

Floating on
phosphoric acid
(H_3O_4P) till milky
aspects appear
plus 15 min



Alumina membranes





Experimental setup

Data evaluation

Inverse funnelling

Atomic layer deposition