

Materials List for:

Proof-of-Concept for Gas-Entrapping Membranes Derived from Water-Loving SiO₂/Si/SiO₂ Wafers for Greener Desalination

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Materials

Name	Company	Catalog Number	Comments
3D Printer	BCN3D	020.180510.3103	BCN3D Sigma 3D printer for printing test module with PLA (polylactic acid) filament.
Acetone	BASF		
AZ-5214 E photoresist	Merck		
AZ-726 MIF developer	Merck		
Chrome Etchant	MicroChemicals	TechniEtch Cr01	To remove chromium from silicon wafer and mask
Conductivity Meter	Hanna	HI98192	To measure conductivity of pure water during leak testing.
Confocal microscope	Zeiss	ZEISS LSM 710	For fluorescence imaging of water.
Contact Aligner	EVG	EVG6200	Mask aligner
Deep ICP-RIE	Oxford Instruments	Plasmalab system100	
DI water			
Direct writer	Heidelberg Instruments	µPG501 direct-writing system	UV exposure
Food Dye	Kroger		Green food dye to label salty water.
Glass Petri dish	VWR		
HMDS vapor prime	Yield Engineering systems		
Hot plate	Cost effective equipments	Model 1300	
Hydrogen peroxide 30%	VWR chemicals		To prepare piranha solution.
Imaris software	Bitplane	Version 8	Postprocess confocal microscopy images
Nitrogen gas			
Optical surface profiler	Zygo	Zygo newview 7300	
Photomask	Nanofilm		5-inch soda lime glass mask
Profilometer	Veeco	Detak 8	Stylus profilometer
Reactive Sputter	Equipment Support Company Ltd		Chromium sputtering
Reactive-Ion Etching (RIE)	Oxford Instruments	Plasmalab system100	
Reflectometer	Nanometrics	Nanospec 6100	To check remaining oxide layer thickness.
Rhodamine B	Merck	81-88-9	Dye for imaging water meniscus under confocal microscope.
SEM stub	Electron Microscopy Sciences		
SEM-Quanta 3D	FEI	Quanta 3D FEG Dual Beam (SEM/FIB)	

Silicon wafer	Silicon Valley Microelectronics		Double side polished, 4" diameter, 300 μm thickness, 2 μm thick oxide layer, p-doped, <100> orientation.
Sodium Chloride	Merck	7647-14-5	For preparing NaCl solution
Sonicator	Branson	1510	
Spin coater	Headway Research, Inc.		
Spin dryer	MicroProcess	Avenger Ultra Pure 6	Spin drying in Nitrogen environment.
Sputter	Quorum Technologies	Q150T S	Iridium sputter for SEM.
Sulfuric acid 96%	Technic	764-93-9	To prepare piranha solution.
Tanner EDA L-Edit software	Tanner EDA, Inc.		For designing photomask
Tweezers	Excelta		
UV Cure	Tamarack Scientific Co. Inc.	PRX-2000-20	For flood exposure of wafer and photomask
Vacuum oven	Thermo Scientific	13-258-13	Lindberg/Blue M
Wet bench	JST Manufacturing Inc.	17391-015-00	Wet bench used for piranha cleaning