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**Membrane distillation: Recent developments and perspectives**

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738	Effects of superhydrophobic SiO <sub>2</sub> nanoparticles on the performance of PVDF flat sheet membranes for vacuum membrane distillation. <i>Desalination</i> , <b>2015</b> , 373, 47-57	10.3	123
737	Microbial desalination cells as a versatile technology: Functions, optimization and prospective. <i>Desalination</i> , <b>2015</b> , 371, 9-17	10.3	97
736	Review of thermal efficiency and heat recycling in membrane distillation processes. <i>Desalination</i> , <b>2015</b> , 367, 223-239	10.3	97
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561	Energy efficiency of membrane distillation up to high salinity: Evaluating critical system size and optimal membrane thickness. <b>2018</b> , 211, 715-734		79
560	Optimization of novel composite membranes for water and mineral recovery by vacuum membrane distillation. <i>Desalination</i> , <b>2018</b> , 440, 39-47	10.3	24
559	Enhanced, hydrophobic, fluorine-containing, thermally rearranged (TR) nanofiber membranes for desalination via membrane distillation. <b>2018</b> , 550, 545-553		38
558	Designing and optimization of continuous direct contact membrane distillation process. <i>Desalination</i> , <b>2018</b> , 426, 97-107	10.3	39
557	Application of solar energy in water treatment processes: A review. <i>Desalination</i> , <b>2018</b> , 428, 116-145	10.3	147
556	Microporous polypropylene membrane prepared via TIPS using environment-friendly binary diluents and its VMD performance. <b>2018</b> , 548, 332-344		35
555	Recent Advances in Techniques for Flavor Recovery in Liquid Food Processing. <b>2018</b> , 10, 81-94		29
554	Thermodynamic analysis and energy efficiency of thermal desalination processes. <i>Desalination</i> , <b>2018</b> , 428, 29-39	10.3	54
553	Recent developments in polymeric electrospun nanofibrous membranes for seawater desalination.. <b>2018</b> , 8, 37915-37938		32
552	Commercial scale membrane distillation for solar desalination. <b>2018</b> , 1,		49
551	Heat and Mass Transport in Modeling Membrane Distillation Configurations: A Review. <b>2018</b> , 6,		44
550	Membrane distillation of saline and oily water using nearly superhydrophobic PVDF membrane incorporated with SiO nanoparticles. <b>2018</b> , 78, 2532-2541		4
549	The effect of heterogeneity in ion-exchange membrane structure on Donnan Exclusion. <b>2018</b> , 1090, 012045		1
548	Passive solar high-yield seawater desalination by modular and low-cost distillation. <b>2018</b> , 1, 763-772		147
547	Immobilization of Graphene Oxide on the Permeate Side of a Membrane Distillation Membrane to Enhance Flux. <b>2018</b> , 8,		21
546	Computational fluid dynamics modeling for performance assessment of permeate gap membrane distillation. <b>2018</b> , 568, 55-66		11

545	Preparation of CuONPs@PVDF/Non-Woven Polyester Composite Membrane: Structural Influence of Nanoparticle Addition. <b>2018</b> , 10,		7
544	Enhancement of brackish water desalination using hybrid membrane distillation and reverse osmosis systems. <b>2018</b> , 13, e0205012		8
543	Novel electrospun polyvinylidene fluoride-graphene oxide-silver nanocomposite membranes with protein and bacterial antifouling characteristics. <b>2018</b> , 12, 365-382		32
542	Fabrication of novel PVDF/P(VDF-co-HFP) blend hollow fiber membranes for DCMD. <b>2018</b> , 566, 442-454		14
541	Robust superhydrophobic electrospun membrane fabricated by combination of electrospinning and electrospraying techniques for air gap membrane distillation. <i>Desalination</i> , <b>2018</b> , 446, 70-82	10.3	51
540	Direct contact membrane distillation for the treatment of wastewater for a cooling tower in the power industry. <b>2018</b> , 1, 57-68		8
539	How to select the optimal membrane distillation system for industrial applications. <b>2018</b> , 565, 402-410		10
538	Chemical Vapor Deposition of Photocatalyst Nanoparticles on PVDF Membranes for Advanced Oxidation Processes. <b>2018</b> , 8,		28
537	Design and experimental analysis of a vapor compression heat pump combined with double-stage forced-circulation evaporators. <b>2018</b> , 6, 523-534		7
536	Surface modification of glass fiber membranes by fluorographite coating for desalination of concentrated saline water with humic acid in direct-contact membrane distillation. <b>2018</b> , 205, 284-292		21
535	A hybrid electric field assisted vacuum membrane distillation method to mitigate membrane fouling.. <b>2018</b> , 8, 18084-18092		7
534	Fabrication and post-treatment of nanofibers-covered hollow fiber membranes for membrane distillation. <b>2018</b> , 562, 38-46		22
533	Self-roughened omniphobic coatings on nanofibrous membrane for membrane distillation. <b>2018</b> , 206, 14-25		57
532	Experimental characterization and optimization of multi-channel spiral wound air gap membrane distillation modules for seawater desalination. <b>2018</b> , 205, 212-222		50
531	Fabrication of novel Janus membrane by nonsolvent thermally induced phase separation (NTIPS) for enhanced performance in membrane distillation. <b>2018</b> , 563, 298-308		41
530	Membrane contactors: An alternative for de-aeration of salt solutions?. <b>2018</b> , 205, 231-240		7
529	Prediction models to analyse the performance of a commercial-scale membrane distillation unit for desalting brines from RO plants. <i>Desalination</i> , <b>2018</b> , 445, 15-28	10.3	36
528	Stable Superhydrophobic Ceramic-Based Carbon Nanotube Composite Desalination Membranes. <b>2018</b> , 18, 5514-5521		102

527	Direct integration of a vacuum membrane distillation module within a solar collector for small-scale units adapted to seawater desalination in remote places: Design, modeling & evaluation of a flat-plate equipment. <b>2018</b> , 564, 617-633		29
526	Bi <sub>2</sub> Se <sub>3</sub> -assisted membrane crystallization. <b>2018</b> , 5, 912-919		26
525	Performance and Fouling Study of Asymmetric PVDF Membrane Applied in the Concentration of Organic Fertilizer by Direct Contact Membrane Distillation (DCMD). <b>2018</b> , 8,		7
524	Nanostructure depositions on alumina hollow fiber membranes for enhanced wetting resistance during membrane distillation. <b>2018</b> , 564, 227-236		32
523	Visualizing and evaluating wetting in membrane distillation: New methodology and indicators based on Detection of Dissolved Tracer Intrusion (DDTI). <i>Desalination</i> , <b>2018</b> , 443, 307-322	10.3	23
522	Fluorographite-co-polydimethylsiloxane coated polyvinylidene-fluoride membrane for desalination of highly saline water with humic acid in direct contact membrane distillation. <b>2018</b> , 167, 255-266		7
521	An Experimental and Theoretical Study on Separations by Vacuum Membrane Distillation Employing Hollow-Fiber Modules. <b>2018</b> , 10, 947		12
520	Sustainable operation of membrane distillation for hypersaline applications: Roles of brine salinity, membrane permeability and hydrodynamics. <i>Desalination</i> , <b>2018</b> , 445, 123-137	10.3	16
519	A general predictive model for direct contact membrane distillation. <i>Desalination</i> , <b>2018</b> , 445, 181-196	10.3	15
518	Localized heating with a photothermal polydopamine coating facilitates a novel membrane distillation process. <b>2018</b> , 6, 18799-18807		75
517	An overview of process systems engineering approaches for process intensification: State of the art. <b>2018</b> , 133, 160-210		158
516	Membrane distillation to regenerate different liquid desiccant solutions for air conditioning. <i>Desalination</i> , <b>2018</b> , 443, 137-142	10.3	22
515	Assessment of a pilot system for seawater desalination based on vacuum multi-effect membrane distillation with enhanced heat recovery. <i>Desalination</i> , <b>2018</b> , 443, 110-121	10.3	50
514	Separation Technologies for Salty Wastewater Reduction in the Dairy Industry. <b>2019</b> , 48, 325-353		10
513	Assessing omniphobicity by immersion. <b>2019</b> , 534, 156-162		29
512	Principles and advancements of air gap membrane distillation. <b>2019</b> , 35, 817-859		11
511	Evaluating the potential of superhydrophobic nanoporous alumina membranes for direct contact membrane distillation. <b>2019</b> , 533, 723-732		42
510	Implementation of two multiphase flow methods in modeling wetting of microporous hydrophobic membranes. <b>2019</b> , 691, 1251-1261		3

509	Hydrophobic nanostructured wood membrane for thermally efficient distillation. <b>2019</b> , 5, eaaw3203		47
508	Integrated membrane distillation-reverse electro dialysis system for energy-efficient seawater desalination. <b>2019</b> , 253, 113551		45
507	Fabrication and Surface Interactions of Super-Hydrophobic Silicon Carbide for Membrane Distillation. <b>2019</b> , 9,		3
506	Electrospun cellulose nanofibers for superhydrophobic and oleophobic membranes. <b>2019</b> , 590, 117271		54
505	Investigation of flux attenuation and crystallization behavior in submerged vacuum membrane distillation (SVMD) for SWRO brine concentration. <b>2019</b> , 143, 107567		11
504	High-Flux Direct-Contact Pervaporation Membranes for Desalination. <b>2019</b> , 11, 28461-28468		30
503	Enhanced biogas production and in situ ammonia recovery from food waste using a gas-membrane absorption anaerobic reactor. <b>2019</b> , 292, 121864		13
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501	Critical performance assessment of a submerged hybrid forward osmosis - membrane distillation system. <i>Desalination</i> , <b>2019</b> , 468, 114082	10.3	22
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498	Maximizing quality of life remains an ultimate goal in the era of precision medicine: exemplified by lung cancer. <b>2019</b> , 2, 8-12		1
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496	Visible Light Photocatalytic Functional TiO <sub>2</sub> /PVDF Nanofibers for Dye Pollutant Degradation. <b>2019</b> , 36, 1900091		8
495	Performance improvements by embedded spacer in direct contact membrane distillation □ Computational study. <i>Desalination</i> , <b>2019</b> , 470, 114103	10.3	15
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493	Field Demonstration of a Nanophotonics-Enabled Solar Membrane Distillation Reactor for Desalination. <b>2019</b> , 58, 18829-18835		18
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491	Dense Membrane Crystallization in Gas/Liquid Systems: Key Parameters Influencing Fouling. <b>2019</b> , 58, 20134-20146		1
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489	A comparative analysis of flat sheet and capillary membranes for membrane distillation applications. <i>Desalination</i> , <b>2019</b> , 456, 1-12	10.3	14
488	Structural tailoring of hierarchical fibrous composite membranes to balance mass transfer and heat transfer for state-of-the-art desalination performance in membrane distillation. <b>2019</b> , 7, 2376-2384		32
487	Freestanding carbon nanomembranes and graphene monolayers nanopatterned via EUV interference lithography. <b>2019</b> , 6, 021002		16
486	Treatment of Wastewater Solutions from Anodizing Industry by Membrane Distillation and Membrane Crystallization. <b>2019</b> , 9, 287		6
485	Water and Wastewater Treatment Systems by Novel Integrated Membrane Distillation (MD). <b>2019</b> , 3, 8		37
484	ECTFE membrane fabrication via TIPS method using ATBC diluent for vacuum membrane distillation. <i>Desalination</i> , <b>2019</b> , 456, 13-22	10.3	39
483	Recovery of pure water and crystalline products from concentrated brine by using membrane distillation crystallization. <b>2019</b> , 54, 396-408		6
482	Development of A Novel Corrugated Polyvinylidene difluoride Membrane via Improved Imprinting Technique for Membrane Distillation. <b>2019</b> , 11,		24
481	Electrospun polyvinylidene fluoride/fluorinated acrylate copolymer tree-like nanofiber membrane with high flux and salt rejection ratio for direct contact membrane distillation. <i>Desalination</i> , <b>2019</b> , 466, 68-76	10.3	26
480	Evaluation of Permeate Quality in Pilot Scale Membrane Distillation Systems. <b>2019</b> , 9,		16
479	Enhanced flux in direct contact membrane distillation using superhydrophobic PVDF nanofibre membranes embedded with organically modified SiO <sub>2</sub> nanoparticles. <b>2019</b> , 94, 2826-2837		31
478	Aluminum fumarate MOF/PVDF hollow fiber membrane for enhancement of water flux and thermal efficiency in direct contact membrane distillation. <b>2019</b> , 588, 117204		34
477	Keramische Membranen in der Membrandestillation. <b>2019</b> , 91, 1101-1109		3
476	Numerical simulations for fluid dynamics and temperature patterns in membrane distillation channels. <b>2019</b> , 55, 3509-3522		1
475	Bio-inspired gas-entrapping membranes (GEMs) derived from common water-wet materials for green desalination. <b>2019</b> , 588, 117185		18
474	Design of omniphobic interfaces for membrane distillation - A review. <b>2019</b> , 162, 64-77		116



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472	A closer look on the development and commercialization of membrane contactors for mass transfer and separation processes. <b>2019</b> , 227, 115679		8
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470	Superhydrophobic PVDF nanofibre membranes coated with an organic fouling resistant hydrophilic active layer for direct-contact membrane distillation. <b>2019</b> , 575, 363-372		32
469	Photothermal Membrane Water Treatment for Two Worlds. <b>2019</b> , 52, 1215-1225		72
468	Morphological changes and creep recovery behavior of expanded polytetrafluoroethylene (ePTFE) membranes used for membrane distillation. <b>2019</b> , 584, 236-245		9
467	Membrane distillation development. <b>2019</b> , 133-159		4
466	Recent Studies on Fluorinated Silica Nanometer-Sized Particles. <b>2019</b> , 9,		8
465	Membrane Distillation: Now and Future. <b>2019</b> , 329-385		1
464	Investigation of salt penetration mechanism in hydrolyzed polyacrylonitrile asymmetric membranes for pervaporation desalination. <i>Desalination</i> , <b>2019</b> , 463, 32-39	10.3	16
463	Sol-gel derived zirconia membrane on silicon carbide substrate. <b>2019</b> , 39, 3804-3811		8
462	Novel PTFE hollow fiber membrane fabricated by emulsion electrospinning and sintering for membrane distillation. <b>2019</b> , 583, 200-208		62
461	Mesoporous and Nanocomposite Fibrous Materials Based on Poly(ethylene terephthalate) Fibers with High Craze Density via Environmental Crazeing: Preparation, Structure, and Applied Properties. <b>2019</b> , 11, 18701-18710		5
460	Fabrication of $\text{Si}_3\text{N}_4$ -nanowire/ $\text{Si}_2\text{SiO}_7$ composite superhydrophobic membrane for membrane distillation. <b>2019</b> , 16, 2173-2180		5
459	Fouling and wetting in the membrane distillation driven wastewater reclamation process - A review. <b>2019</b> , 269, 370-399		94
458	Development of a novel perfluoropolyether (PFPE) hydrophobic/hydrophilic coated membranes for water treatment. <b>2019</b> , 581, 58-71		18
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456	Innovation in Process Engineering for Hydrology. <b>2019</b> , 3-5		

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454	Performance analysis of vacuum membrane distillation regenerator in liquid desiccant air conditioning system. <b>2019</b> , 102, 112-121		15
453	3D printed spacers based on TPMS architectures for scaling control in membrane distillation. <b>2019</b> , 581, 38-49		36
452	Surface hydrophobicity based heat and mass transfer mechanism in membrane distillation. <b>2019</b> , 580, 275-288		26
451	Air gap membrane distillation of MEG solution using PDMS coated polysulfone hollow fiber membrane. <b>2019</b> , 76, 1-9		12
450	Investigation of forward osmosis performance and anti-fouling properties of the novel hydrophilic polymer brush-grafted TFC-type FO membranes. <b>2019</b> , 94, 2198		6
449	Optimization of multistage membrane distillation system for treating shale gas produced water. <i>Desalination</i> , <b>2019</b> , 460, 15-27	10.3	18
448	Two-membrane air fresheners for continuous non-energized perfume delivery. <b>2019</b> , 581, 114-122		1
447	Electrospun nanofibrous membranes in membrane distillation: Recent developments and future perspectives. <b>2019</b> , 221, 44-63		49
446	Metals removal from acid mine drainage (Tinto River, SW Spain) by water gap and air gap membrane distillation. <b>2019</b> , 582, 20-29		13
445	Reduction of scaling in microwave induced membrane distillation on a carbon nanotube immobilized membrane. <b>2019</b> , 5, 1012-1021		11
444	Computational and experimental study for the desalination of petrochemical industrial effluents using direct contact membrane distillation. <b>2019</b> , 9, 1		6
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424	Microbubble aeration enhances performance of vacuum membrane distillation desalination by alleviating membrane scaling. <b>2019</b> , 149, 588-595	45
423	Reinforced superhydrophobic membrane coated with aerogel-assisted polymeric microspheres for membrane distillation. <b>2019</b> , 573, 570-578	42
422	Solar powered desalination Technology, energy and future outlook. <i>Desalination</i> , <b>2019</b> , 453, 54-76	10.3 198
421	Comparative performance assessment of flat sheet and hollow fiber DCMD processes using CFD modeling. <b>2019</b> , 212, 709-722	16
420	Influence of PGMD module design on the water productivity and energy efficiency in desalination. <i>Desalination</i> , <b>2019</b> , 452, 29-39	10.3 16

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418	On-line solvent exchange system: Automation from extraction to analysis. <b>2019</b> , 1047, 231-237		5
417	Water Treatment by Renewable Energy-Driven Membrane Distillation. <b>2019</b> , 179-211		4
416	Wastewater Treatment by Renewable Energy Driven Membrane Processes. <b>2019</b> , 1-19		3
415	Submerged vacuum membrane distillation crystallization (S-VMDC) with turbulent intensification for the concentration of NaCl solution. <b>2019</b> , 211, 151-161		23
414	Distillate flux enhancement of the concentric circular direct contact membrane distillation module with spiral wired flow channel. <b>2019</b> , 94, 70-80		0
413	Overcoming temperature polarization in membrane distillation by thermoplasmonic effects activated by Ag nanofillers in polymeric membranes. <i>Desalination</i> , <b>2019</b> , 451, 192-199	10.3	56
412	Hybrid desalination processes for beneficial use of reverse osmosis brine: Current status and future prospects. <i>Desalination</i> , <b>2019</b> , 454, 104-111	10.3	78
411	Enhanced performance of superhydrophobic polypropylene membrane with modified antifouling surface for high salinity water treatment. <b>2019</b> , 214, 11-20		41
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409	Ceramic Membrane Distillation for Desalination. <b>2020</b> , 49, 317-356		14
408	Dissolved hydrogen sulfide removal from anaerobic bioreactor permeate by modified direct contact membrane distillation. <b>2020</b> , 233, 116036		9
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406	Optimization of module length and number of stages in a multistage membrane distillation configuration. <b>2020</b> , 33, 526-546		3
405	Assessment of air gap membrane distillation for milk concentration. <b>2020</b> , 594, 117403		14
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399	Green Synthesis of Nanoparticles and Their Applications in Water and Wastewater Treatment. <b>2020</b> , 349-379		22
398	A novel layer-by-layer heterogeneous cation exchange membrane for heavy metal ions removal from water. <b>2020</b> , 381, 120884		68
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394	A pilot study of spiral-wound air gap membrane distillation process and its energy efficiency analysis. <b>2020</b> , 239, 124696		13
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384	Nonalcoholic Beer. <b>2020</b> , 167-200		3

383	Graphene-Based Stand-Alone Networks for Efficient Solar Steam Generation. <b>2020</b> , 59, 1135-1141	16
382	Developing and validating linear dynamic models for direct contact membrane distillation during start-up over wide operating conditions. <b>2020</b> , 134, 106678	3
381	Hybrid forward osmosis-membrane distillation system: Demonstration of technical feasibility. <b>2020</b> , 33, 101042	16
380	Removal of organic micropollutants using advanced membrane-based water and wastewater treatment: A review. <b>2020</b> , 598, 117672	99
379	Assessing potential of nanofiltration, reverse osmosis and membrane distillation drinking water treatment for pharmaceutically active compounds (PhACs) removal. <b>2020</b> , 33, 101029	30
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377	Lithium recovery from artificial brine using energy-efficient membrane distillation and nanofiltration. <b>2020</b> , 598, 117683	32
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176	Environment Modeling for Sustainable Development. <b>2020</b> , 229-253			
175	Role of Membranes in Wastewater Treatment. <b>2021</b> , 247-281			
174	Innovative Routes for Acid Mine Drainage (AMD) Valorization. <b>2020</b> , 189-218			3
173	Fouling and Wetting: A Major Challenge for Membrane Distillation. <b>2021</b> , 161-192			2
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170	Combination of computational fluid dynamics and design of experiments to optimize modules for direct contact membrane distillation. <i>Desalination</i> , <b>2022</b> , 524, 115460	10.3		2
169	A Single Step Preparation of Photothermally Active Polyvinylidene Fluoride Membranes Using Triethyl Phosphate as a Green Solvent for Distillation Applications. <b>2021</b> , 11,			1
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162	Application of computational fluid dynamics technique in membrane distillation processes. <b>2022</b> , 161-208		
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159	Nanobubble-assisted scaling inhibition in membrane distillation for the treatment of high-salinity brine.. <b>2021</b> , 209, 117954		1
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154	Experimental and Numerical Investigations on Gas Injection-Enhanced Air Gap Membrane Distillation for Water Desalination. <b>2022</b> , 61, 1850-1862		1
153	Carbon Black/Polyvinylidene Fluoride Nanocomposite Membranes for Direct Solar Distillation. <b>2022</b> , 15, 740		1
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149	A review of sodium chloride-based electrolytes and materials for electrochemical energy technology. <b>2022</b> , 10, 2637-2671		3
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147	Effect of hollow fiber membrane properties and operating conditions on preventing scale precipitation in seawater desalination with vacuum membrane distillation. <i>Desalination</i> , <b>2022</b> , 527, 115578	10.3	2
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