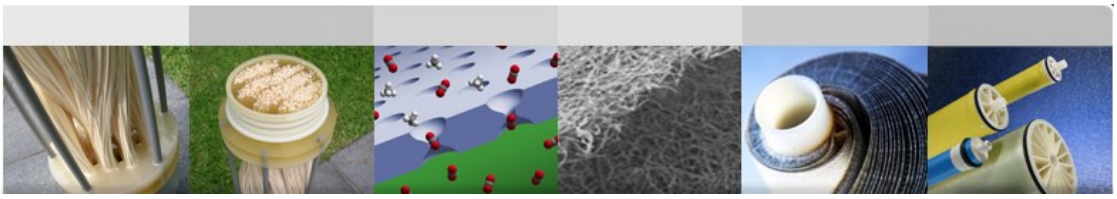
Membrane Society of Australasia



Inside this issue

UNESCO Centre for Membrane Science and Technology welcomes new director

Innovators corner

MSA workshop report

MSA General Meeting Schedule

Upcoming events:

- MSA AGM, 3 pm on 15th May 2015
- MSA Workshop: Advances in forward osmosis, UNSW, Sydney, 18th Jun 2015
- MSA Workshop: Ceramic based membranes for gas separation applications, 2nd July 2015, Brisbane.
- AMS9 Taipei, Taiwan, 19th-21st July 2015
- 2nd International Conference on Desalination using Membrane Technology, Singapore, 26th - 29th July 2015
- 9th International Mesostructured Materials Symposium, Brisbane, 17th-20th August 2015
- Euromembrane, Aachen, Germany, 6th -10th Sep 2015

UNESCO Centre for Membrane Science and Technology welcomes new director

Professor Greg Leslie has been recently appointed as the new director of the Centre. Professor Leslie is the fifth director and succeeds founding director Professor Chris Fell, co-directors Hans Coster and Tony Fane (1992-2005) and Professor Vicki Chen (2006-2014).

Professor Leslie's research interest surrounds water and resource recovery. His research team uses advanced experimental and computational fluid dynamics (CFD) modelling techniques to improve the performance of membrane processes to recycle water and nutrients from municipal and industrial waste. Recent projects have targeted the performance of polymeric and ceramic membranes in desalination, water recycling, biofuels and meat abattoir applications.

Professor Leslie was the co-recipient of the Australian Museum Eureka Prize for Water Innovation in 2010 and holds major grants including:

- Australian Research Council/Discovery Project (2013-2015). Characterising nanostructure functionality of conventional and advanced polymeric membranes using electrical impedance Spectroscopy.
- Australia-India Strategic Research Fund (AISRF) (2012-2015) Development of innovative spent wash treatment systems and resource recovery.

For more details, visit: http://www.membrane.unsw.edu.au/

- Pierre Le-Clech, University of New South Wales -

Innovators Corner

Researchers from the School of Engineering at the University of Melbourne, in conjunction with CSIRO, have developed new membranes or micro-filters that will result in clean water in a much more energy efficient manner. Published recently in the journal *Advanced Materials*, the new membranes will supply clean water for use in desalination and water purification applications.

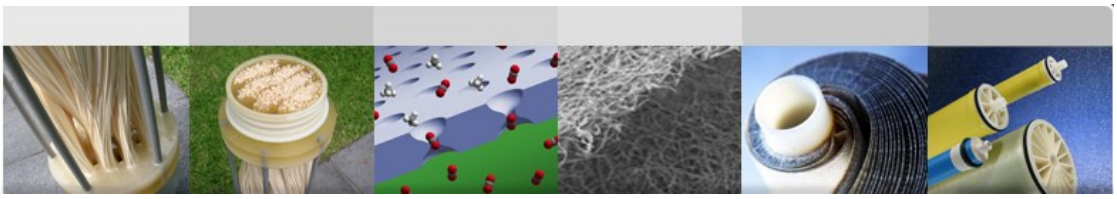
Sandra Kentish, Professor in the Department of Chemical and Biomolecular Engineering said that up until now, there has not been a way to add chlorinating agents to water to prevent biological growth in the desalination process. "Such biofouling has been a major issue to date, but the new membranes have the potential to lead to a more economic desalination operation," she said.

"The new membranes perform at a comparable level to existing commercial membranes used in these applications, but importantly show greater resistance to attack by chlorine containing chemicals"

For Professor Kentish, the availability of fresh water for drinking, irrigation and industrial use is one of the grand challenges of this century. Energy efficient water purification has the potential to improve the lives of billions of people around the world. "The new membranes perform at a comparable level to existing commercial membranes used in these applications, but importantly show greater resistance to attack by chlorine containing chemicals," Professor Kentish said. "The chlorine resistant membrane materials can cut out additional processing steps reducing operating costs. They can also prevent the decrease in water flow that is currently observed with time due to biological fouling" she said.

The novel membrane technology uses layer-by-layer polymer assembly and has been developed by a collaborative research team including Professor Kentish with Professor Frank Caruso and Dr Jacky Cho from the Melbourne School of Engineering and Dr Anita Hill from CSIRO. The work was made possible through funding from the Science and Industry Endowment Fund (SIEF).

- Science Daily [http://www.sciencedaily.com/releases/2015/03/150324101459.htm] -



MSA Workshop Report: Advances in Pre-treatment Processes for Desalination

From left to right: Greg Leslie (UNSW), Pierre Le-Clech (UNSW), Neil Palmer (NCEDA), Vicki Chen (UNSW), Vigi Vigneswaran (UTS)

The workshop was successfully conducted on 26th February 2015 at UNSW, Sydney. Organized by A/Prof Pierre Le Clech and Adhikara Resosudarmo, the full day workshop featured presentations by upcoming and established researchers as well as industrial delegates from DOW, Xylem, NuSep, Evoqua, Veolia, BASF and Orica. More than 20 delegates were present at UNSW for the workshop, with videoconferencing being made available for participants from Victoria University and the University of Queensland.

Opening statements to the workshop were given by Neil Palmer (NCEDA) and A. Prof Pierre Le Clech. Adhikara Resosudarmo spoke of the current trends in desalination pretreatment as well as the strength and potential shortcomings of UF membranes. Professor Vigi Vigneswaran from UTS described innovative membrane bioreactor pretreatment technologies to remove assimilable organic carbon, hence preventing the development of biofouling in reverse osmosis membrane. Dr Steven Cao from Evoqua Water Technologies then gave an interesting presentation on recent developments with their new CPII Ultrafiltration systems. The talk highlighted Evoqua's commitment towards designing the most energy efficient UF pretreatment systems and minimizing operating costs. Pierre Le Clech then hosted a discussion session, giving industrial delegates the opportunity to address the audience with their views on the current state of desalination pretreatment, as well as potential research opportunities in the near future.

In the afternoon presentations, Dr Sophie Leterne (Flinders) described advances in prevention and removal of transparent exopolymer particles. Adhikara Resosudarmo spoke of utilizing in-line coagulation and dissolved air flotation to mitigate membrane fouling during algal bloom. Dr Darli Myat (UNSW, VU) then spoke of huge flux increases which could be achieved through the use of advanced oxidation. Yulia Shutova (UNSW) covered the use of advanced characterization techniques for the quantification of seawater organic matter.

Acknowledgements go to the sponsors of this workshop, the NCEDA and the MSA, without which this event would not have been made possible.

- Adhikara Resosudarmo & Pierre Le-Clech, UNSW -

Upcoming Workshop: Advances in forward osmosis

This event will time place on the 18th of Jun 2015 at UNSW and is organised by UNSW/UNESCO Centre for Membrane Science and Technology and UTS/ The Centre for Technology in Water and Wastewater, in collaboration with the Membrane Society of Australasia (MSA) and the National Centre of Excellence in Desalination Australia (NCEDA). Many Australian research groups have recently invested towards desalination research and especially on novel desalting technologies. In particular, the use of forward osmosis (FO) for desalination and water treatment has been widely studied. From the development of new membrane to the optimisation of operational conditions, the many strategies studied by Australian researchers will be discussed during this workshop. This event will offer the opportunity to showcase the latest findings for a number of NCEDA projects, but also more broadly of various return of experiences to discuss the potential future for FO in Australia and the technical challenges still to be overcome.

Confirmed speakers include: Tony Fan (SMTC), HK Shon (UTS), Gaetan Blandin (UNSW), Shuaifei Zhao (CSIRO), Kha Tu (Monash University), Vincent Liu (Monash University), Ming Xie (Victoria University), Ludovic Dumee (Deakin University). For more information and register, please visit MSA website (http://www.membrane-australasia.org/).

- Gaetan Blandin & Pierre Le-Clech, UNSW -

MSA General Meeting

Annual general meeting will take place at 3 pm on 15th May 2014. No booking is required for your attendance.
Location: Kens Chemical Sciences Lv LG G37 AC Seminar Room, University of New South Wales, Kensington Campus.

Editors: Kha Tu & Huanting Wang
Please contact the editor to contribute to future editions. Email: newsletter@membrane-australasia.org