

Theme Talk

Robust Membrane Technologies for Sustainable Management of Wastewater from Industries

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Abstract

Wastewater from industry presents a major environmental and health concern when not treated or disposed of correctly. While management of industry wastewater has greatly improved since the industrial revolution, reducing their negative environmental impact is still a major priority for healthy communities living and working among them. Membrane technologies are well suited to address these issues, and are progressing fast in terms of enhanced performance, industry experience and reduced cost. This talk will present research at Victoria University on membrane technology made from robust materials such as polytetrafluoroethylene (PTFE), ceramic and steel, to treat 'challenging' industrial wastewaters from textile, mining, meat and dairy industries. For example, PTFE membranes were used with a novel membrane distillation (MD) process at pilot scale to produce fresh water from saline textile wastewater with a view to capture salts and reuse via a zero liquid discharge (ZLD) concept. The same process was tested at bench scale for a concept ZLD process to process coal seam gas wastewater and various wastewaters from dairy plants in Australia. For the meat industry, testing of a novel porous metal microfiltration (MF) membrane showed an advanced capability to recover valuable tallow and proteins from challenging organic rich wastewater. Ceramic MF membranes were also trialled at pilot scale to provide treated water from municipal wastewater at lower cost and higher reliability compared to polymeric membranes. Recent work on concept solar cleaned porous glass MF membranes will also be presented, which is proving to have potential as a simple, chemical free means to produce purified water from impaired local sources. With the progress on robust membrane technology to treat industry wastewaters, reduced negative impacts to the environment and health can be afforded to support healthy and thriving communities.

Keywords: Industrial waste water, Membrane Technology, Robust material