Desalination: Recent Advances and Challenges for Seawater Reverse Osmosis (SWRO) Membrane Technology

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Abstract

Apart from water reuse and recycling, seawater desalination is another option to provide alternative water resources for the human population. Over the years, Seawater Reverse Osmosis (SWRO) desalination technology is becoming more important in many parts of the world. Singapore, for example, is targeting 30% of its future water need will come from seawater desalination. Under the Sustainable Development Goals (SDG) 6 which is to ensure availability and sustainable management of water and sanitation for all, desalination has also been mentioned as one of the technologies that should be considered through international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs. Over the last two decades, 20,000 desalination plants worldwide have been constructed growth indicating tremendous growth of this technology.

However, there are several issues and challenges that need to be overcome in order for the SWRO technology to be improved further. Among the major challenges are on (i) SWRO membrane permeability trade-off, (ii) insufficient boron rejection, (iii) membrane fouling, and (iv) poor chlorine resistance. Various improvements have been made by researchers all over the world to overcome these challenges. These have led to further innovations on SWRO technology as well as other technologies that can complement the SWRO technology. The talk will discuss and provide recent advances on these issues with the aim to provide future perspectives and ideas for membrane researchers to focus their research.

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