

Performance analysis of hybrid RO–MD–PRO process by numerical approach

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Current water demands are dramatically increasing due to climate change and population growth. Membrane-based desalination technologies hold the potential to reduce water stress, and particularly, RO is dominating the global market due to its reliability (P. Sukitpaneenit and T.-S Chung, 2012). However, environmental concerns caused by brine still hinder the further development of RO. Another promising technology is membrane distillation (MD) that has high salt rejection and fouling resistance. However, MD has not reached the commercial stage yet because of the much energy requirement (Mohamed Khayet, 2010). To this end, hybrid MD applications have caught attention. In this study, we introduce an novel desalination process; hybridization of MD, RO and pressure retarded osmosis (PRO). The performance of the suggested process is analyzed by using numerical simulations. (Acknowledgements) This study was supported by a project of the Global Ph.D. Fellowship (National Research Foundation of Korea) and by a Basic Research Projects in High-tech Industrial Technology grant (GIST) in 2013.