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Innovative method of using brine water to produce energy

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Abstract

Water is an essential resource to sustainable life. Shortage of water to meet daily needs is a reality today for one in three people all around the world. Globally, the problem is getting worse as cities and populations grow, and the demands for water increase. Clean water scarcity underscores a crucial need to desalinate and make use of saline and brackish waters. Use of Reverse Osmosis (RO) and Electrodialysis Reversal (EDR) technology systems has significantly increased over the past two decades. Main problem associated with these methods is concentrate stream inasmuch as disposal of saline concentrate water has negative environmental effects. Hence, any attempt to reduce the volume and make beneficial use of concentrate stream could significantly increase the practical deployment of saline and brackish water desalination. An innovative and unique approach aiming to mitigate this problem is to grow microalgae in concentrate stream disposal. Microalgae can consume nutrients available in reject water to grow and finally be converted to biofuel. As a consequence, to investigate the viability of using concentrate stream in order to grow microalgae some sets of full factorial experiment with completely randomized design arrangement have been designed. In one of the experiments, the growth of *Chlorella Sorokiniana* using concentrate, BBM, and three levels of concentrate and BBM (25%, 50% and 75%) under 16-h of illumination and the 8-h dark period at 25^{o}C was investigated. Based on research findings, the percentage of biomass increase will be maximized in 25% Concentrate medium.

Biography

Saeid Aghahossein Shirazi is doing his master in Chemical Engineering at New Mexico State University. He got his bachelor in Chemical Engineering at University of Tehran. He is working on algal biofuel project in Institute for Energy and the Environment (IEE) at New Mexico State University. his research is mostly focused on upstream operations such as optimizing the growth of algae with appropriate media.