Solar Energy Driven Membrane Distillation Process to Produce Fresh Water from Undrinkable Water

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One big issue faced by many today is water shortages, especially in developing countries. These areas are found with water but not drinkable water, due to the lack of sanitation. Even in areas with a plentiful water supply, natural disasters can lead to water shortages. For example, Hurricane Maria affected Puerto Rico and many islands in its path, turning them inhabitable. Thousands of people relied on bottled water donated from countries offering to help. Membrane distillation technology can be an effective approach to produce fresh water from undrinkable water. Additionally, people can use solar energy to provide power for the membrane distillation process. In this project, I built a prototype solar energy driven membrane distillation system. Using seawater as the model undrinkable water, this system can make fresh water which meets the EPA requirement. Additionally, I also conducted an Engineering design to calculate the membrane area and solar panel needed for a practical application. The results of this project demonstrate that the solar energy driven membrane distillation process could be very environmentally friendly as well as cost effective.

Awards Won: