Engineering of a Solar-Powered Water Desalination Prototype Integrated With Graphene-Based Membrane for Efficient Salt Removal

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Despite our planet being covered with 75% water, still over 40% of the global population does not have access to sufficient clean water. Therefore, this project aimed to tap on the largest source of water on our planet, which is salt water. We engineered a solar-powered desalination system equipped with graphene-based membrane. To accomplish this, we utilized the following method: First we built the prototype using acrylic and glass plates. We used a 3D-printer to create the graphene oxide holder and placed it inside a small chamber within the prototype. We subjected the prototype to multiple check to make sure that there is no leak inside and outside the prototype. Next, we placed salt water inside the prototype and exposed it under the sun and collected the filtered samples. The water sample collected underwent a series of testing which included salinity test, water potability test, and microbial test. After conducting the tests, the results showed that the engineered prototype was able to remove salt from the saltwater by 99.98889% showing a great efficiency in removing salt from the water. The potability tests showed that the desalination prototype enhanced the quality of the water making drinkable. Lastly, the microbial checked showed no bacterial growth after the desalination process. This project proved that desalination can be done using cheap materials and no energy consumption.

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