Portable Graphene Oxide Desalination

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The scarcity of drinkable water is becoming a worldwide, where 2.7 billion people find water scarce for at least a month out of the year. This scarcity puts an emphasis on developing new methods to turn the abundant seawater into drinkable water. This is a process known as desalination, and has been known since the 4th Century BCE. However, the current methods of desalination are vastly inefficient and are more costly than conservation methods for saving water. That being said, a new method of desalination produced at the University of Manchester shows significant promise in this field. This process using the substance known as graphene oxide (GO), a newly discovered material that filters out all substances except for water and hydrogen atoms. This project studies the creation of GO and the transformation of the liquid GO into a free-standing membrane that is capable of desalinating saltwater on a portable level. The end product that was created is a portable, straw-like device that can desalinate saltwater with little power input. To determine the marketability of this product, the GO membranes were created from raw materials to finished product using limited laboratory equipment, and all of this was done in a home environment. This was done to see how easily GO could be made, which has been a drawback to GO products being readily available on the market. The final product can desalinate saltwater from an average ocean salinity of 3.5% to roughly .45%, which is safe for human consumption.

Awards Won:

Fourth Award of $500