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Zwitterionic Polymers for Fouling-Resistant Desalination Membranes

Zwitterionic copolymers for desalination membranes

Background

Approximately 97% of the earths water is undrinkable; of the remaining water only 1% is easily accessible. Unfortunately, current methods of sea water desalination are costly and inefficient. Polymeric membranes are a promising solution to this problem and have received significant focus due to their low cost, straightforward synthesis, and versatility. However, their intrinsically low hydrophobicity (affinity towards water) limits their potential use as desalination membranes. Therefore, an effective methodology which improves the hydrophilicity of polymeric desalination membranes is needed.

Invention Description

Researchers at ASU have developed a polymeric desalination membrane with improved hydrophilicity using a convenient synthetic route. The polymeric membrane utilizes charge-modified zwitterionic and sulfone groups to improve hydrophilicity and longevity. Experimental data show that the membrane developed by researchers at ASU retains its capacity to desalinate water even after exposure to high concentrations of chlorine ions. This technology represents an innovative approach to a historically difficult challenge and may provide a more effective means of purifying salinized water.

Potential Applications

- Desalination
- Separation

Benefits and Advantages

- Enduring- Exposure to harmful ions does not diminish the membranes effectiveness.
- Effective- The membrane rejects 95% of the salt in solution.
- Simplicity- The synthetic method is straightforward and cost effective.

Professor Green's Website

Original Document