

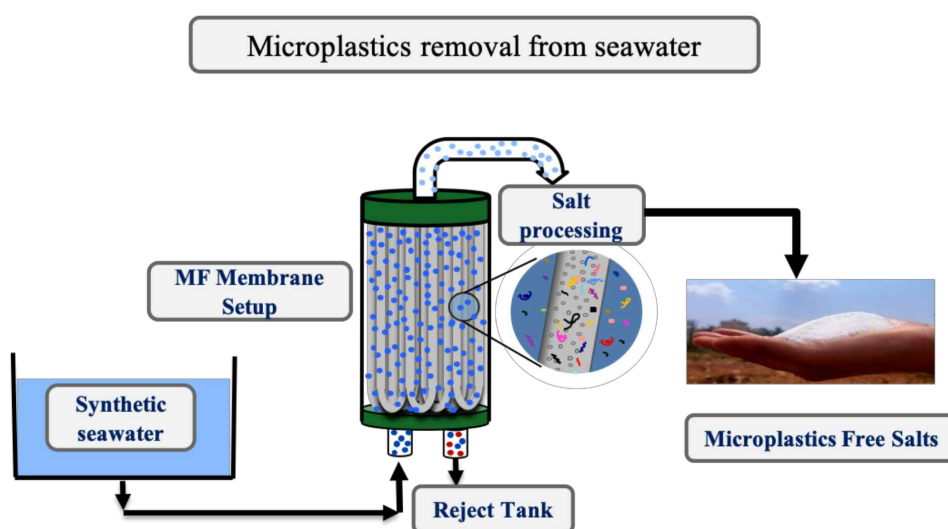
# Microplastics in edible salts and their removal strategy

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## Graphical Abstract



## Abstract

As emerging contaminants, microplastics have attracted attention around the world. The poor degradability allows the plastic waste to stay in the water for a long time and it breaks into smaller and smaller pieces of plastic over time. The findings indicate that human ingestion of microplastics through sea salt is closely linked to the contamination of plastic particles in seawater. Microplastics present in salt may create a potential health hazard for humans. In this work, we have developed an innovative approach for the removal of microplastics from synthetic seawater with the help of membrane technology, which has the potential to avoid the transfer of microplastic particles into salts. The visual evaluation was performed using optical and fluorescence microscopy to classify the shape, size, number, and colour of microplastic particles. A wide range of MPs were found: 1400 - 1900 particles/kg in refined sea salt, 1900 - 2300/kg in unrefined sea salts. The composition of the microplastics were analysed by Raman spectroscopy. The most common MPs were polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), nylon, and polystyrene (PS). This is

the first study, to the best of our knowledge, where we successfully removed microplastics from seawater, which can be used further in the large-scale industry.

**Keywords:** Marine pollution; Salt; Seawater; Microplastics; Membrane technology

**Bio sketch:**

**Prof. Kaustubha Mohanty** has obtained his PhD degree in Chemical Engineering from Indian Institute Technology Kharagpur and is currently working as a Professor of Chemical Engineering at Indian Institute Technology Guwahati. His key research areas are biofuels, biological wastewater treatment, microplastics, membrane technology, microalgae biorefinery and biomass pyrolysis. He has published more than 160 research papers in peer-reviewed journals and edited one book on Membrane Technology & Applications (Taylor & Francis, USA). He is an Associate Editor of Journal of Chemistry; Associate Editor of The Journal of Institution of Engineers (India) Series: E; Associate Editor of Research Journal of Environmental Sciences; Review Editor of Frontiers in Bioenergy and Biofuel and Editorial board member of Renewable Energy (Elsevier). He is a Fellow of Royal Society of Chemistry, UK and Fellow of Institution of Engineers (India) and Life Member of Indian Institute of Chemical Engineers. Currently, he is holding the post of Head, School of Energy Science & Engineering at IIT Guwahati.