Removal of Diclofenac from Water using Polyethylene Terephthalate Membrane

ABSTRACT: Because of its stability and frequent presence in wastewater, Diclofenac sodium, a common anti-inflammatory and painkiller, has become a chronic contaminant in water. The development of alternate removal techniques is essential because conventional treatment methods frequently fall short in their attempts to eradicate it. In order to evaluate the effectiveness of membranes in removing Diclofenac sodium (DCF) from water, waste polyethylene terephthalate (PET) was recycled to create them. Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) were used to analyze the membranes' shape and properties. This allowed for a thorough assessment of the membranes' density, surface structure, elemental composition, and chemical bonding. Filtration studies were used to examine the membranes' capacity to extract Diclofenac sodium (DCF) under varied circumstances. The results show that polyethylene terephthalate (PET) membranes' porosity, surface characteristics, and adjustable qualities are crucial to their ability to effectively remove DCF. To sum up, PET-based membranes offer a practical and affordable solution for treating DCF-contaminated wastewater, with great potential for broader use.

KEYWORDS: Water pollution; Diclofenac Sodium; PET membrane; Non-induced phase separation.