

## **Development of carbon nanotubes (CNTs) membrane from waste plastic: Towards waste to wealth for water treatment**

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### **ABSTRACT**

Plastic, a non-biodegradable material has always been a concern to the environment and people. This single-use item generates waste to landfills and it persists for centuries once disposed. The urge of transforming such material into a highly valuable product has sought attention from many researchers. This study emphasizes on a nanotechnological approach to synthesize vertically-aligned carbon nanotubes (CNTs) on a substrate template using commercially available plastic bags as carbon precursor. CNTs are grown inside a hexagonally arranged nanoporous anodic alumina membranes (NAAMs). CNTs are liberated by wet chemical etching to dissolve the alumina matrix. The resulting CNTs are used as adsorption media filters for water treatment purpose. The high adsorption affinity towards heavy metals, organic matters and microbes, ability to antifouling and self-cleaning function have made CNTs a better choice over others. This article briefly discusses the catalyst-free synthesis, growth mechanism, characterization and functionalization of CNTs for water treatment application.

### **KEYWORDS**

CNTs; Membrane; Waste plastic; Water treatment; Wealth

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