

# Supplementary Material: A Comprehensive Review of Polymeric Wastewater Purification Membranes

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Table S1. Important developments in the field of wastewater purification using different CNTs.

CNTs	Modification technique	Target contaminants	Adsorption capacity	Reference
MWCNTs	-	Eriochrome cyanine R	73.18 mg/g	[1]
Granular CNTs	Al <sub>2</sub> O <sub>3</sub> was bonded with g-CNTs	Diclofenac sodium and carbamazepine	157.4 and 106.5 µmol/g	[2]
MWCNTs	Alkali-activated	Magnetic carbon (MO) & Methylene blue (MB)	MO: 2-10 MB: less than 4 and more than 8	[3]
SWCNTs	-	Bisphenol A and 17α-ethinyl estradiol	75-98%	[4]
SWCNTs & MWCNTs	Carboxylated	Oseltamivir carboxylate (OC) & Oseltamivir (OE)	OC: 6-8 OE: alkaline	[5]
MWCNTs	Grafted with PAAM	Humic acid	80-85%	[6]
Polypyrrole/CNTs-CoFe <sub>2</sub> O <sub>4</sub>	one-pot solvothermal method	Methyl blue	500 mg/L	[7]

HO <sub>2</sub> O <sub>3</sub> /CNT	MOF assisted route	Tetracycline	98%	[8]
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Table S2: Adsorption capacities of various GO-based adsorbents.

GO adsorbent	Targeted contaminant	Adsorption capacity	Reference
PEI-GO	Pb(II)	1000 mg/g	[9]
GO-MnFe <sub>2</sub> O <sub>4</sub>	Pb(II), As(V), As(III)	673, 207, 146 mg/g	[10]
GO-Fe <sub>3</sub> O <sub>4</sub>	Methyl blue and neutral red	167.2, 171.3 mg/g	[11]
PVP-RGO	Cu(II)	539.53 mg/g	[12]
rGO/ZnO	Methyl blue	80%	[13]
GO/BNC	Congo red and Basic blue	99% and 96%	[14]

Table S3: Comparison for merits and demerits of different metal/metal oxide nanoparticles infused membranes.

Sr. No	Membrane material	Advantages	Disadvantages	References
1	Aluminum	Enhanced mechanical strength and antifouling mechanism.	Highly sensitive membranes and can slow down the process with excessive nanoparticles addition.	[15]

2	Zirconium	High water retention, capable of treating high salinity liquids, stable in humid and high temperature conditions.	Highly sensitive to fouling and excessive nanoparticles concentration.	[15]
3	Silver	Highly stable, highly antimicrobial against bacteria, nontoxic, and antifungal.	Interfering of salts and antimicrobial mechanism happens due to excessive release/concentration of silver ions from metal form.	[16]
4	Magnesium	Antibacterial, nontoxic, biocompatible, and follow systematic resistance against various bacteria.	Sensitive to high temperatures, poor corrosion resistance, and less mechanical stability.	[17,18]
5	Copper	Biocidal, resistance to corrosion and biofouling, good photo catalyst.	Low modification stability, uncontrolled release of copper ions, and leaching of copper materials.	[19]

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