

## Chitosan/MXene/GO Catalytic Nanocomposite membrane for Removing Dye and Heavy metals

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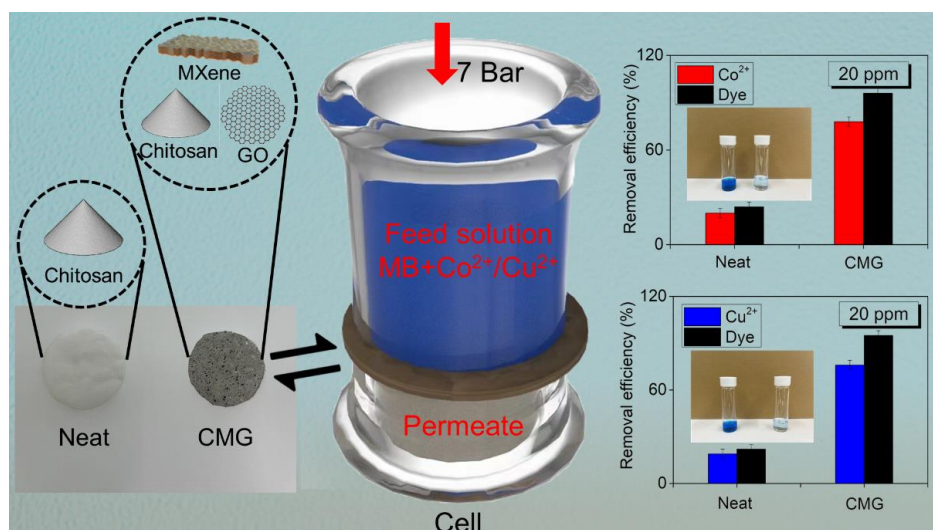
Abstract (Arial 10)

2D materials MXene and graphene oxide (GO) were employed in developing chitosan-based catalytic nanocomposite membranes for the removal of dye molecules and heavy metals from textile industry wastewater. Owing to the existing of defect sites, the incorporated MXene induced the decomposition of hydrogen peroxide ( $H_2O_2$ ), the generation of reactive oxygen species, which oxidize methylene blue (MB) and reduce cobalt ( $Co^{2+}$ ) and copper ( $Cu^{2+}$ ) ions. The fabricated chitosan/MXene/GO (CMG) membrane in this research exhibited high removal efficiencies of 96%, 78% and 76% for dye, cobalt ions and copper ions, which were 4, 3.9 and 4 times higher than that of neat membrane, respectively. Similar results of 95% were also observed in total organic matter (TOC) removal for both concentrations of dye. The CMG membrane also showed superior fouling resistance, which effectively prevented the attachment of bovine serum albumin (BSA) on the membrane surface in accelerated fouling experiment, with much less flux reduction than the neat membrane indicating its remarkable anti-fouling performance that ascribed from the catalytic activity of MXene. The achievements provided a new insight for using nano-additives enhanced membrane technology to efficiently remove hazardous contaminants such as dye and heavy metals from industrial effluent.

### References

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### Figures



**Figure 1:** Simultaneous removal of dye chemical and heavy metals by Chitosan/MXene/GO catalytic nanocomposite membrane.