Graphene oxide membranes for purification and separation*

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We have developed graphene oxide (GO) based membranes with proper control in structure and morphology to be used water purification, selective gas separation and adsorption. In a collaborative project with "Sydney Water" Australia, we have successfully employed our GO membrane to remove Natural Organic Matters (NOMs) from water. Our study shows that GO membranes can reject ~100% of NOM while maintaining high water flux. Furthermore, we have developed a technique that allows controlled reduction of graphene oxide to tune the interlayer spacing and make it suitable for desalination. The reduced graphene oxide (rGO) can have the potential for desalination applications owing to its appropriate interlayer spacing (0.34–0.37 nm) that enables it to block salt ions as small as Na^+ with high precision. I will also present our recent findings on transition metal incorporated graphene oxide (TMGO).

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* This abstract and the results have been (partially/fully) submitted/presented in other conferences and published in different journals. Everyone contributing to this research is highly acknowledged. Joshi will be presenting on behalf of all the researchers/authors.