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Graphene Oxide: Green Synthesis and Membrane Applications

Graphene oxide (GO), an important derivative of graphene, has shown a great potential for many applications such as electronics, optoelectronic, energy storage, separation membranes, and composites. In this talk, I will first introduce a green water electrolytic oxidation method for scalable and highly efficient production of GO. Then, the influence of reduction degree on the performance of GO separation membranes will be discussed and a highly stable GO-based separation membrane with superior permeability will be demonstrated. Finally, I will introduce a scalable and efficient method to produce highly aligned and compact GO films. The synthesis of a variety of high-performance functional films by this method will also be demonstrated, including super-strong and highly conductive reduced GO films, reduced GO/single-walled carbon nanotubes hybrid films for flexible supercapacitors with record volumetric energy density, highly anisotropic graphene nanocomposites as well as various 2D nanosheet films and vertical heterostructures.

References

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