

SPECIAL SEMINAR

“Applications of Graphene-Based Materials in Water Treatment Technologies”

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10:45 a.m.

251 Jorgenson Hall (City Campus)
(about 16th & Vine St.)



Graphene-based materials can bring innovative solutions to the current limitations of water treatment technologies. These technological advances are enabled by different unique features of graphene nanomaterials, such as their open two-dimensional structure, their intrinsic biocidal activity, and the hydrophilicity of graphene oxide-based structures. In this seminar, the use of graphene nanomaterials in membrane-based water treatment will be discussed. Graphene nanomaterials are added to membrane structures to enhance separation performance and to impart antifouling resistance. Here, we compare thin-film nanocomposite polyamide membranes integrating graphene oxide sheets through surface functionalization or in a mixed-matrix membrane structure. The addition of graphene oxide leads to a trade-off between membrane properties and antifouling properties that needs to be balanced in order to maximize the nanocomposite membrane performance. Then, through a systematic analysis of the properties of graphene oxide leading to antimicrobial and antifouling interactions, we identify some of the important parameters that can be used for a rational material design in membrane applications. The broader implications of these findings are discussed in regards to their potential benefits for the field of water treatment.

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