DEPARTMENT OF CHEMISTRY

Nanomaterials for Composites, Biomedical, and Energy Applications

Nanodiamond and Onion-Like Carbon
- Deaggregation of nanodiamond into single-digit particles for production of pure highly stable nanodiamond colloids (patent pending)
- Metal coated nanodiamond particles for metal matrix composites
- Nanodiamond for ceramic matrix composites
- Nanodiamond for drug delivery across the blood-brain barrier and delivery of anticancer therapeutics; theranostic applications
- Graphitization of nanodiamond; onion-like carbon for supercapacitors and batteries

New 2-D Transition Metal Carbides/Nitrides - MXenes
- Development of alternative ways for MXene synthesis
- Discovery and synthesis of novel MXenes
- Modeling of mechanical, electronic, and optical properties of MXenes, MXene intercalation
- Development of MXenes for energy storage, desalination, composites, optical, and sensing applications

Contacts & Information
Vadym Mochalin
Associate Professor of Chemistry and Materials Science & Engineering
http://chem.mst.edu/mochalin-group/mochalinv@mst.edu
Phone: 573-341-6043

Funding
- DAICEL Corp. (Japan)
- Army Research Office (USA)

Keywords
- Nanomaterials; Two-dimensional materials; Zero-dimensional materials; Chemistry of materials; MXene; Nanodiamond; Theranostics; Composites; Energy storage; Supercapacitors; Lithium batteries; Computational modeling

Recognitions

http://chem.mst.edu/mochalin-group