

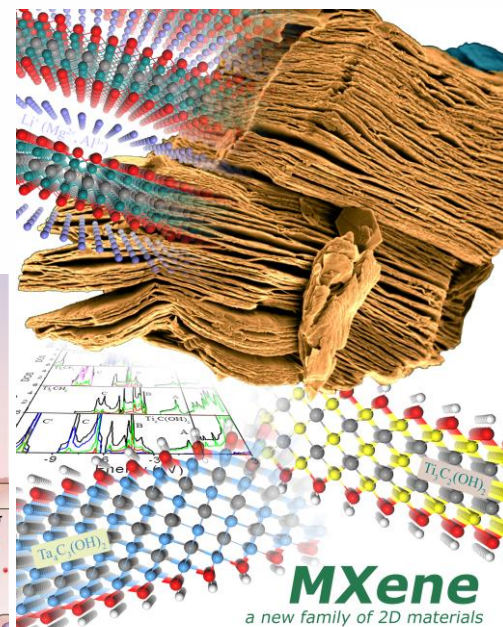
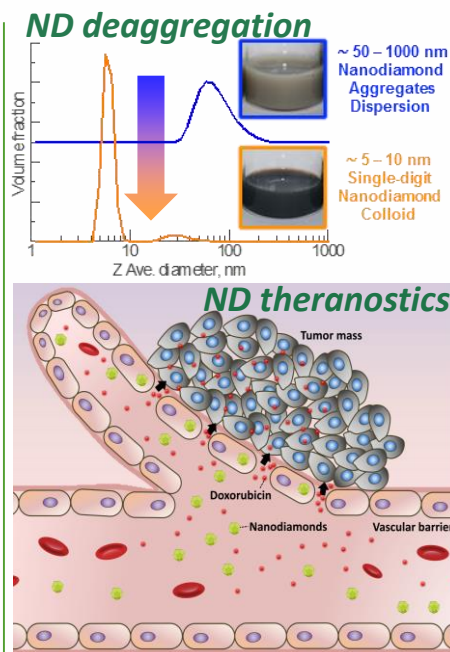
Nanomaterials for Composites, Biomedical, and Energy Applications

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



PoC:

Vadym Mochalin

Associate Professor of Chemistry and
Materials Science & Engineering

Web: <http://chem.mst.edu/mochalin-group>

Email: mochalinv@mst.edu

Phone: 573-341-6043



Keywords

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

Recognitions

- Top 10 Most Read Papers in Nature Nanotechnology (The properties and applications of nanodiamonds, V.N. Mochalin, O. Shenderova, D. Ho, Y. Gogotsi, doi:10.1038/nnano.2011.209)
- G. Zhou, P.I. Lelkes, Y. Gogotsi, V. Mochalin, Functionalized nanodiamond reinforced biopolymers. United States Patent, November 17, 2015, patent number: 9,186,190.

Funding

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