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

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

**Recognitions**

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