

Bioactive Glasses and Ceramics

Compositional Design and Fabrication of Oxide Glasses

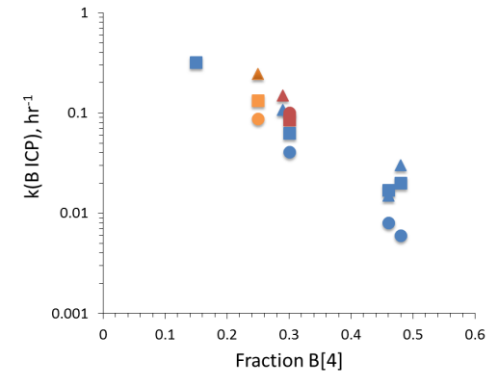
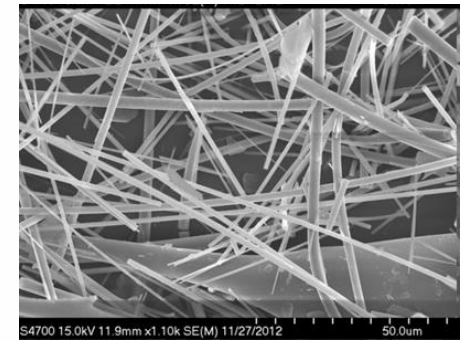
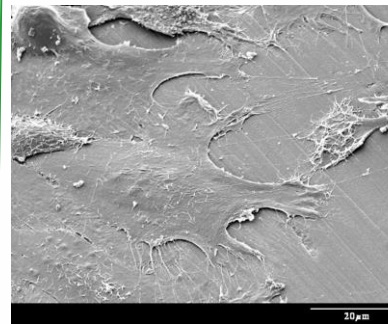
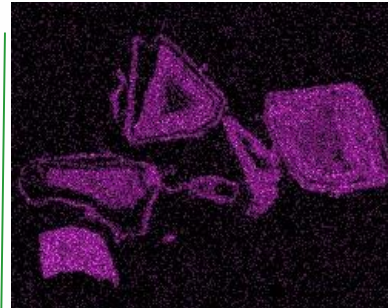
- Bioactive silicate, phosphate, and borate glasses and glass-ceramics; biocompatible and bio-resorbable compositions
- Controlled-release of inorganic ions
- Fabrication of various forms including fibers, solid and hollow microspheres, particles, coatings, etc., including feedstock for additive manufacturing techniques
- Controlled porosity, nano-to-meso-scales

Bio-Corrosion Studies of Glass

- Dissolution and ion-release rates in aqueous environments, including simulated body fluids and cell culture media
- Conversion of glasses to biocompatible materials like hydroxyapatite and calcium carbonate
- Cell compatibility, bactericidal effects

Characterization of Glass Properties and Structures

- Thermal, mechanical, optical properties
- Raman, UV/VIS/IR, solid-state NMR, chromatography, analytical electron microscopy, x-ray photoelectron spectroscopy, x-ray fluorescence, x-ray diffraction

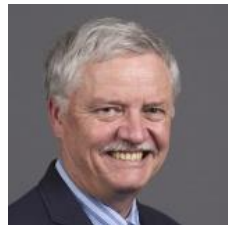


Relate composition to atomic structure in order to design new glasses for biomedical applications

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Recent Funding

National Science Foundation, Department of Education, Department of Energy, Lawrence Livermore Lab, Sandia National Labs, variety of national and international companies

Keywords

- #GlassScience, #Corrosion, #Bioactive, #GlassStructure,

Recognitions

Award: 2016 N.F. Mott Award, J. Non-Cryst. Solids

Service: 2012-13 President of the American Ceramic Society

2019 President, International Congress on Glass

Fellow: American Ceramic Soc., Soc. Glass Technology (UK)

Collaborative Interests

- Tissue engineering, controlled release materials, biomedical devices, bio-interfaces, dental materials