DEPARTMENT OF CHEMICAL AND BIOCHEMICAL ENGINEERING

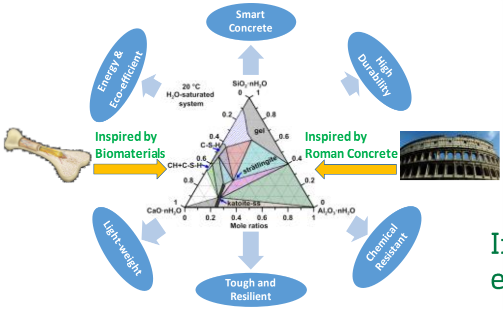
Materials for Sustainable Infrastructure, Energy, & Environment

Materials for Sustainable Infrastructure

- Advanced chemical admixtures for cement & concrete
- Hydration, microstructure, and durability of cement-based materials
- Alternative, eco-efficient and resilient concrete binders
- Nanotechnology and application to cement-based systems
- Thermodynamics-based design of materials for sustainable infrastructure
- Mitigation and control of deteriorative reactions in cement-based materials

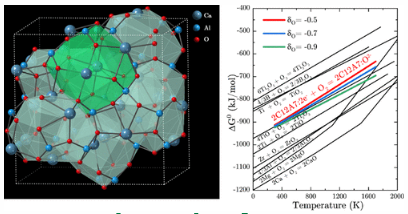
Materials for Sustainable Energy and Environment

- Nanocomposites and functional materials for water treatment
- Waste immobilization and conversion
- CO_2 conversion and utilization in construction materials
- Microporous, inorganic electrides, and energy materials



Nano-engineered, Bio-inspired & Roman concrete-inspired cements:

- Energy and eco-efficient
- Marine-durable & sustainable
- Resilient and lightweight
- Corrosion resistant

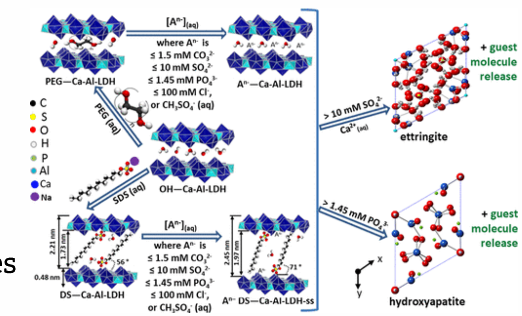


Inorganic electrides for waste energy harvesting and catalysis:

- Room-temperature stable
- Low-cost
- Optically transparent

Design of nanocomposites that are capable of:

- Sequestering heavy metal contaminants
- Immobilizing radionuclides



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Keywords

#Cement and Concrete, #Materials, #Nanocomposites, #Sustainability, #Thermodynamics, #Admixtures, #Rheology #Energy and Environment, #Wastewater/Water Treatment, #Waste immobilization

Recognitions

- Materials and Structures Outstanding Paper 2016
- Principals Research Excellence Award, Aberdeen 2013
- Best Graduating Student and University Valedictorian 2007

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