

## **Carol J. Mertz, Ph.D.**

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### **Professional Experience**

- **1998-Present.** Chemist in the Nuclear Forensics and Nanoscale Engineering Group of the Chemical Sciences and Engineering Division at Argonne National Laboratory.
- **1994-1998.** Assistant Chemist in the Chemical Engineering Division at Argonne National Laboratory.
- **1991-1994.** Postdoctoral Appointee in the Chemical Technology Division at Argonne National Laboratory.

### **Education**

- Ph.D., Physical Chemistry, Northern Illinois University, DeKalb, Illinois, 1992.
- B.A., Chemistry, College of Notre Dame of Maryland, Baltimore, Maryland, 1986.

### **Awards**

- Argonne Pacesetter Award (2000)
- Northern Illinois University Outstanding Woman Student Award for Outstanding Achievement in Graduate School (1991)
- Iota Sigma Pi, Anna Louise Hoffman Award for Outstanding Achievement in Graduate Research (1990)
- Travel Scholarship for Symposium on Classical and Quantal Simulations for Reactive and Solvation Dynamics and their Critical Tests at American Chemical Society (ACS) 195th National Meeting, Boston (1990)
- Graduate Student Teaching Award (1987, 1989)
- American Chemical Society, Maryland Section Student Award (1986)
- Notre Dame Academic Achievement Award (1982-1986)

### **Career Activities & Highlights**

- Focus on nuclear and hazardous waste separations, radioactive remediation activities, and nanoscale systems for biomedical applications
- Development of quantitative, chemical separation protocols for radioactive strontium from urine for rapid diagnostics and for radioactive cesium sources from daughter products for age-dating estimations

- Development of nuclear separation protocols based upon extraction chromatography and solvent extraction technologies for microfluidic devices
- Experience with post-event restoration with the development of a radiological decontamination technology for porous building materials to mitigate release and combat terrorism through sequestration of radionuclides with a nanoparticle-gel system
- Advance proof-of-concept for biomedical applications with the use of magnetic nanoparticles for
  1. detoxification of blood-borne toxins,
  2. encapsulation of lipophobic therapeutic drugs and gene therapy agents, and
  3. on-demand release of therapeutic agents from nanoparticles.
- Support industrial-scale spent fuel processing through development of waste forms for spent fuel process streams containing cesium and strontium
- Experience in remediation support projects for the decontamination of radioactive contaminants from stainless steel
- Extensive experience in nuclear materials corrosion testing and characterization of corrosion products under potential geologic repository conditions
- Design, test, and evaluate colloidal and radionuclide mobilization resulting from degradation of defense high-level waste glasses, N-reactor (metallic uranium) spent nuclear fuels, and ceramic waste forms
- Analyses using dynamic and static light scattering of colloidal systems including microemulsions, reverse micelles, and polymeric actinides
- Investigation of molecular events of local anesthetics in lipophilic environments by low-temperature spectroscopy

### **Professional Organizations**

- Treasurer, Division of Industrial and Engineering Chemistry, American Chemical Society (1999-2002)

### **Publications & Patents**

- Publications: 33
- Patents: 1
- Disclosures: 2