

Biographical Sketch

Shulamith Schlick Professor of Physical and Polymer Chemistry

Education

B.Sc., Chemical Engineering, Technion, Israel Institute of Technology, Haifa, Israel.

M.Sc., Polymer Chemistry, Technion, Israel Institute of Technology, Haifa, Israel.

D. Sc., Physical Chemistry, Technion, Israel Institute of Technology, Haifa, Israel.

Appointments

Professor of Chemistry, Department of Chemistry and Biochemistry, University of Detroit Mercy, 1983-present.

Weston Visiting Professor, Weizmann Institute of Science, Rehovot, Israel, April-June 2008.

Visiting Professor, Max-Planck Institute for Polymer Research, Mainz, Germany, February- May 2004.

Visiting Professor, Department of Chemistry, University of Bologna, Italy, January-May 2001.

Visiting Professor, Department of Chemistry, University of Florence, Italy, May 1998.

Visiting Professor, Department of Polymer Chemistry, Tokyo Institute of Technology, October 1996-February 1997.

Varon Visiting Professor, Weizmann Institute of Science, Rehovot, Israel, January-June 1990.

Visiting Professor, Centre d'Études Nucléaires de Grenoble, August 1989-January 1990.

Senior Research Associate, University of Windsor, Windsor, Canada, 1980-1983.

Fellowships and Awards

- Foreign Collaborator Fellowship of the French Atomic Energy Commission, CEA Grenoble, France, 1989.
- Varon Professorship, Weizmann Institute of Science, Rehovot, Israel, 1990.
- President's Award for Faculty Excellence, University of Detroit, 1990.
- National Science Foundation (NSF) Award for Exceptional Creativity in Research, 1990.
- Founders' Fellowship of the American Association of University Women (AAUW), 1991/92.
- The J. Heyrovsky Honorary Medal of the Czech Academy of Sciences for Merit in the Chemical Sciences, 1996.
- National Science Foundation/Center for Global Partnership (Japan) Fellowship at the Tokyo Institute of Technology, October 1996-February 1997.
- National Science Foundation (NSF) Award for Exceptional Creativity in Research, 1998.
- Fellow of the Institute of Advanced Study, University of Bologna, January-May 2001.
- Honorary Doctorate (*Doctor Honoris Causa*) from Linköping University, Sweden, May 2003.
- The Maria Sklodowska-Curie Medal from the Polish Radiation Research Society, “*in appreciation of your achievements in the field of radiation chemistry and photochemistry and your fruitful collaboration with Polish scientists*” (March 2007).
- UDM Distinguished Faculty Award-2007
- National Science Foundation (NSF) Award for Exceptional Creativity in Research, 2007.

Research Interests

ESR and ESRI of degradation and stabilization processes in thermally- and chemically-treated and UV-irradiated polymers; stability of polymeric membranes used in fuel cells; DFT calculations of the geometry and electronic structure of organic radicals, with emphasis on fluorinated radicals; ESRI in dosimetry and tumor-targeted radiation for cancer treatment; dynamics of polymers intercalated in the galleries of a fluoromica inorganic clay.

Selected Publications

Five publications directly related to recent research

1. **Danilczuk, M.; Coms, F.D.; Schlick, S.** Fragmentation of Model Compounds Exposed to Oxygen Radicals: Spin Trapping ESR Experiments, and Implications for Behavior of PEMs in Fuel Cells, *Fuel Cells* **2008**, 8(6), 436-452.
2. **Bosnjakovic, A.; Schlick, S.** Spin Trapping by DMPO in Fenton Media in the Presence of Nafion Perfluorinated Membranes: Limitations and Potential, *J. Phys. Chem. B* **2006**, 110, 10720-10728.
3. **Kadirov, M.K.; Bosnjakovic, A.; Schlick, S.** Membrane-Derived Fluorinated Radicals Detected by ESR in UV-Irradiated Nafion and Dow Ionomers: The Effect of Counterions and H₂O₂, *J. Phys. Chem. B* **2005**, 109, 7664-7670.
4. **Spalek, T.; Kruczala, K.; Sojka, Z.; Schlick, S.** Deducing 1D Concentration Profiles From ESR Imaging: A New Approach Based on Optimization With the Genetic Algorithm, *J. Magn. Reson.* **2007**, 189, 139-150.
5. **Danilczuk, M.; Coms, F.D.; Schlick, S.** Visualizing Chemical Reactions and Crossover Processes in a Fuel Cell Inserted in the ESR Resonator: Detection by Spin Trapping of Oxygen Radicals, Nafion-Derived Fragments, and Hydrogen and Deuterium Atoms, *J. Phys. Chem. B* **2009**, web posting 19 May 2009.

Five additional publications

6. *Advanced ESR Methods in Polymer Research*, S. Schlick, Ed.; Wiley: Hoboken, NJ, 2006; 12 chapters, 353 pages, ISBN 9780471731894.
7. **Roduner, E.; Schlick, S.** ESR Methods for Assessing the Stability of Polymer Membranes Used in Fuel Cells, In *Advanced ESR Methods in Polymer Research*, S. Schlick, Ed.; Wiley: Hoboken, NJ, 2006; Chapter 8, pp 197-228.
8. **Danilczuk, M.; Bosnjakovic, A.; Kadirov, M.K.; Schlick S.** Direct ESR and Spin Trapping Methods for the Detection and Identification of Radical Fragments in Nafion Membranes and Model Compounds Exposed to Oxygen Radicals, *J. Power Sources* **2007**, 172, 78-82.
9. **Lund, A.; Macomber, L.; Danilczuk, M.; Stevens, J.; Schlick, S.** Determining the Geometry and Magnetic Parameters of Fluorinated Radicals by Simulation of Powder ESR Spectra and DFT Calculations: The Case of the Radical RCF₂CF₂[•] in Nafion Perfluorinated Ionomers, *J. Phys. Chem. B* **2007**, 111, 9484-9491.
10. **Gustafsson, H.; Kruczala, K.; Lund, E.; Schlick, S.** Visualizing the Dose Distribution and Linear Energy Transfer by 1D and 2D ESR Imaging: A Potassium Dithionate Dosimeter Irradiated with C⁶⁺ and N⁷⁺ Ions, *J. Phys. Chem. B* **2008**, 112, 8437-8442 (Letter).

Collaborators during the past five years

Anders Lund, Eva Lund, K. Kruczala, Z. Sojka, M.K. Kadirov, J. Healy, F.D. Coms, H. Gustafsson, E. Roduner, T Spalek, J. Stevens, D. Schiraldi, G. Jeschke, Yohei Miwa.

Synergistic Activities.

A list of up to five examples that demonstrate the broader impact of the individual's professional and scholarly activities that focuses on the integration and transfer of knowledge as well as its creation. Mention Educ programs DOE applied may 2009.