Larry Curtiss

CONTACT INFORMATION

Address: Argonne National Laboratory
9700 S, Cass Ave
Argonne, IL, 60516
Phone: (630) 252-7380
Email: curtiss@anl.gov

EDUCATION AND TRAINING

B.S., University of Wisconsin-Madison, Chemistry, 1969
M.S., Carnegie-Mellon University, Physical Chemistry, 1971
PhD., Carnegie-Mellon University, Physical Chemistry, 1973

RESEARCH AND PROFESSIONAL EXPERIENCE

Larry Curtiss is an Argonne Distinguished Fellow and Group Leader of the Molecular Materials Group in the Materials Science Division at Argonne National Laboratory. He is also a Senior Investigator of the Joint Center for Energy Storage Research (JCESR), a DOE Energy Storage Hub, and Deputy Director of the Center for Electrical Energy Storage, a DOE Energy Frontier Research Center. His research has focused on computational chemistry including the development of new quantum chemical methods for accurate energy calculations (G1, G2, G3, and G4 theories) and the application of computational methods to problems in materials science and chemistry including catalysis, batteries, and carbon materials. His recent computational studies have focused on the design of new electrolytes and electrolyte additives for Li-ion batteries, modeling of anode materials for Li-ion batteries, the understanding of charge and discharge chemistries in Li-O_2 and Li-S batteries, catalytic reaction mechanisms of supported subnanometer clusters and 2-D materials, and biomass conversion reaction mechanisms. He has over 460 publications with over 49,000 citations and an H-Index of 81. He is also co-inventor of more than 5 patents. He is listed as a Highly Cited Researcher in Chemistry by the Institute for Scientific Information (ISI).

1998 – present Senior Scientist and Group Leader, Molecular Materials Chemistry Group, Materials Science, Argonne National Laboratory

2000 – present Argonne Distinguished Fellow, ANL

2006 – 2009 Acting Group Leader, Center for Nanoscale Materials, ANL

2004 – present Senior Fellow, Computational Institute, University of Chicago/ANL

1988-1998 Senior Scientist, Basic Energy Sciences Section, Chemical Technology Division, ANL

1984-1988 Scientist, Chemical Technology Division, ANL

1977-1984 Assistant Scientist, Chemical Technology Division, ANL

1976 – 1977 Research Associate, Chemical Technology Division, ANL

1973-1976 Battelle Institute Fellow, Battelle Memorial Institute, Columbus, Ohio.

SELECTED RECENT PUBLICATIONS

- Tuning the electrolyte network structure to invoke quasi-solid state sulfur conversion and suppress lithium dendrite formation in Li–S batteries, Q. Pang, A. Shyamsunder, B. Narayanan, C. Y. Kwok, L. A. Curtiss, L. F. Nazar, Nature Energy (2018) https://doi.org/10.1038/s41560-018-0214-0
- M. Asadi, B. Sayahpour, P. Abbasi, A. T. Ngo, K. Karis, J. R. Jokisaari, C. Liu, B. Narayanan, M. Gerard1, P. Yasaei, X. Hu, A. Mukherjee, K. C. Lau, R. S. Assary, F. Khalili-Araghi, R. F. Klie, L. A. Curtiss, Amin Salehi-Khojin1 "Lithium-Oxygen Batteries with Long Cycle Life in a Realistic Air Atmosphere,", *Nature*, 555, 502 (2018) doi:10.1038/nature25984
- Perspective: Size selected clusters for catalysis and electrochemistry, A. Halder, L. A. Curtiss, A. Fortunelli, S. Vajda, J. Chem. Phys. 148, 110901 (2018).DOI: 10.1063/1.5020301
- J. Lu, Z. Chen, Z. Ma, F. Pan, L. A. Curtiss, K. Amine, Nature "The Role of Nanotechnology in the Development of Battery Materials for Electric Vehicles," Nature Nanotechnology 11, 1031–1038 (2016) doi:10.1038/nnano.2016.207
- J. Lu, Y. J. Lee, X. Luo, K. C. Lau, M. Asadi, H.-H. Wang, S. Brombosz, J. G. Wen, D. Zhai, Z. Chen, D. J. Miller, Y. S. Jeong, J.-B. Park, Z. Z. Fang, B. Kumar, A. Salehi-Khojin, Y.-K. Sun, L. A. Curtiss, K. Amine, A Lithium-Oxygen Battery Based on Lithium Superoxide *Nature* 2016, 529, 377. DOI: 10.1038/nature16484
- Tailoring the Edge Structure of Molybdenum Disulfide toward Electrocatalytic Reduction of Carbon Dioxide, M. Abbasi, M. Asadi, C. Liu, S. S. Sharifi-Asl, A. Behranginia, B. Sayahpour, P. Zapol, R. S. Yassar, L. A. Curtiss, A. Salehi-Khojin. *ACS Nano*, **11**, 453 (2017).
- Transition metal dichalcogenides as highly active catalysts for carbon dioxide reduction, Mohammad Asadi, Kibum Kim, Cong Liu, Aditya Venkata Addepalli, Pedram Abbasi, Poya Yasaei, Patrick Phillips, Amirhossein Behranginia, José M. Cerrato, Richard Haasch, Peter Zapol, Bijandra Kumar, Robert F. Klie, Jeremiah Abiade, Larry A. Curtiss, Amin Salehi-Khojin, Science, 353, 467-470 (2016). DOI: 10.1126/science.aaf4767
- Effect of Siloxane Ring Strain and Cation Charge Density on the Formation of Coordinately Unsaturated Metal Sites on Silica: Insights from Density Functional Theory (DFT) Studies, Ujjal Das, Guanghui Zhang, Bo Hu, Adam S Hock, Paul C Redfern, Jeffrey T Miller, Larry A Curtiss, ACS Catalysis, 5, 7177-7185 (2016).
- Carbon Dioxide Conversion to Methanol over Size-Selected Cu-4 Clusters at Low Pressures, C. Liu, B. Yang, E. Tyo, S. Soenke, J. DeBartolo, B. von Issendorff, P. Zapol, S. Vajda, and L. A. Curtiss, J. Am. Chem. Soc. 137, 8676-8679 (2015). DOI: 10.1021/jacs.5b03668
- Accelerating Electrolyte Discovery for Energy Storage with High-Throughput Screening L. Cheng, R. S. Assary; X. H. Qu, A. Jain, S. P. Ong; N. N. Rajput; K. Persson, L. A. Curtiss, J. Physcial Chemistry Letters, 6, 283-291 (2015) DOI: 10.1021/jz502319n
- Effect of the size-selective silver clusters on lithium peroxide morphology in lithium–oxygen batteries, J. Lu, L. Cheng, K. C. Lau, E. Tyo, X. Luo, J. Wen, Dean Miller, R. S. Assary, H.-H. Wang, P. Redfern, H. Wu, J.-B. Park, Y.-K. Sun, S. Vajda, K. Amine, L. A. Curtiss, Nature Communications 5, 4895 (2014) doi:10.1038/ncomms5895