Exponent®
Engineering & Scientific Consulting

Yifei Liu, Ph.D.

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Professional Profile

Dr. Yifei Liu's primary area of expertise is in organic/organometallic chemistry, with an emphasis on the chemical analysis and characterization of polymeric materials. She has over five years of experience in polymer failure analysis and a special focus on solving complex issues regarding their application to sophisticated consumer electronics products such as adhesives, thermoplastics and composite materials.

Dr. Liu also specializes in design/synthesis and device fabrication of organic light emitting devices (OLEDs), as well as materials chemistry of information storage systems, specifically molecular wires and switches. She has experience with synthesis of fluorescent and phosphorescent materials as well as extensive knowledge of the factors that influence OLED performance, ranging from molecular-level interactions to final commercial product operations.

In addition, Dr. Liu actively assists clients in the biomedical space, including support for CFDA approvals and biomedical regulatory compliance; she is a certified ISO 13485:2016 lead auditor with years of factory audit experience.

Dr. Liu's material characterization skills cover a wide variety of surface and bulk material characterization techniques including mass spectrometry (HPLC-MS, GC-MS, MALDI-TOF), X-ray crystallographic analysis (single crystal diffraction, powder diffraction), spectrofluorimetry, fluorescence and phosphorescence lifetime measurement, quantum yield and efficiency measurement, spectroscopic ellipsometry, liquid nuclear magnetic resonance (NMR), UV-Visible spectroscopy (UV-Vis), electrochemistry (CV, DPV, bulk electrolysis), spectroelectrochemistry (UV-Vis-NIR characterization), Fourier transform infrared (FTIR) spectroscopy, X-ray photoelectron spectroscopy (XPS), scanning electron microscopy (SEM), electron transmission spectrometry (TEM), focused ion beam (FIB), rheology, differential scanning calorimetry (DSC), thermogravimetric analysis (TGA) and dynamic mechanical analysis (DMA).

Prior to joining Exponent, Dr. Liu's Ph.D. research utilized a synthesis-intensive background encompassing organic synthesis (inert atmosphere, Schlenk techniques), organometallic synthesis (Ru, Os, and Ir chemistry, Al, and Zn chemistry), and nonmetallic inorganic material synthesis (porcelain enamel coatings). She also has hands-on experience using high vacuum zone sublimation, high vacuum deposition, organic vapor phase deposition of organics and metals, and solution processes to fabricate devices.

Academic Credentials & Professional Honors

Ph.D., Chemistry, University of Southern California, 2014

M.S., Catalysis and Molecular Chemistry, University of Rennes 1, France, 2008

B.S., Materials Science and Engineering, Donghua University, China, 2006

The University of Southern California Fellowship, 2008-2014

Department of Chemistry Fellowship, University of Southern California, 2010-2014

Professional Affiliations

American Chemical Society—ACS

Materials Research Society—MRS

Patents

US Patent: Ir(III) complexes with phosphinoaryl cyclometalated ligands. Submitted July 2013 (Thompson ME, Liu Y, Djurovich PI).

Publications

Liu Y, Djurovich PI, Thompson ME. Synthesis and photophysical study of bispincer osmium complex. Polyhedron 2014; 84:136-143.

Liu Y, Ndiaye CM, Lagrost C, Costuas K, Choua S, Turek P, Norel L, Rigaut S. Diarylethene-containing carbon-rich ruthenium organometallics. Tuning of electrochromism. Inorganic Chemistry 2014; 53:8172-8188.

Liping T, Jun W, Huichun Q, Weizhong J, Yifei L, Zhen L, Dong L, Xiaoying C, Gang W. Study of the transitional layer structure of Gas-Gas heater enamels. Glass & Enamels 2009; 2:10-13.

Liu Y, Lagrost C, Costuas K, Noureddine Tchouar, Le Bozec H, Rigaut S. Multifunctional switches with carbon-rich ruthenium and diarylethene units. Chemical Communications 2008; 6117 6119.

Baoning Z, Weizhong J, Yifei L, Liyun C. The preparation and light catalyzing properties of TiO2 film on the surface of enamel. Glass & Enamel 2005; 33(4):47-50.

Representative Presentations

Thompson ME, Krylova V, Liu Y. Efficient electroluminescence from heavy (Ir) and not so heavy (Cu) metal complexes. Optics+Photonics, San Diego, CA, August 2013.

Liu Y, Djurovich PI, Thompson ME. Synthesis and photophysical study of Ir(III) complexes with diphenylphosphinoaryl cyclometalates. 20th International Symposium on the Photophysics and Photochemistry of Coordination Compounds (ISPPCC), Traverse City, MI, July 2013.

Pikov V, Romanenko S, Lin M-Y, Weitz A, Thompson M, Liu Y, Chow RH. Iridium-based nanoswitch for light-activated cellular prosthesis. Arnold and Mabel Beckman Initiative for Macular Research (BIMR). Irvine, CA, January 2013.

Liu Y, Djurovich PI, Thompson ME. Synthesis of bispincer osmium complex. Division of Inorganic Chemistry, 243rd ACS National Meeting, San Diego, CA, Spring 2012.

Liu Y, Lagrost C, Costuas K, Le Bozec H, Rigaut S. Ruthenium carbon-rich complexes for multifunctional organometallic switches. International Conference of Organometallic Chemistry, Rennes, France, July 2008.

Additional Education & Training

Molecular Modeling: Schrödinger 2013 Materials Science Suite, Gaussian 03/09, SpartanModel

Software packages: MS Office, OriginLab, ChemBioDraw, Chemcraft, Mercury, Diamond (Crystal and Molecular Structure Visualization), SHLEX, AutoCAD, 3DS MAX

Diamonds and Diamond Grading Certification (GIA)

Peer Reviews

The Journal of Physical Chemistry Letters

Journal of the American Chemical Society

Chemistry - A European Journal