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**Education**

09/2008 – 02/2014 Ph.D. in Department of Materials Science and Engineering, Seoul National University, Republic of Korea

Thesis: Photocatalytic Water Reduction with Cyclometalated Transition Metal Complexes

Advisor: Professor Soo Young Park

03/2006 – 02/2008 M.S. in Department of Materials Science and Engineering, Seoul National University, Republic of Korea

Thesis: Organic Light-Emitting Devices and Chemosensors Using Phosphorescent Iridium Complexes

Advisor: Professor Soo Young Park

03/1999 – 08/2003 B.S. in Department of Materials Science and Engineering, Seoul National University, Republic of Korea

**Professional and Teaching Experience**

11/2016 – current Assistant Professor, Linz Institute for Organic Solar Cells (LIOS) / Institute of Physical Chemistry, Johannes Kepler University Linz, Austria

07/2016 – 10/2016 Postdoctoral Assistant, Linz Institute for Organic Solar Cells (LIOS) / Institute of Physical Chemistry, Johannes Kepler University Linz, Austria

03/2014 – 06/2016 Senior Researcher, Center for Supramolecular Optoelectronic Materials and Department of Materials Science and Engineering, Seoul National University, Republic of Korea

03/2009 – 06/2016 Instructor and Consultant for Computational Chemistry, Center for Supramolecular Optoelectronic Materials and Department of Materials Science and Engineering, Seoul National University, Republic of Korea

### **Research achievements and interests**

- ◆ Design and synthesis of transition metal complexes: fine synthesis of ligands and coordination chemistry.
- ◆ Artificial photosynthesis: solar to fuel/chemical production.
- ◆ Density functional theory (DFT) based quantum chemical calculation.
- ◆ Phosphorescent organometallic complexes for organic light-emitting devices (OLEDs) and light-emitting electrochemical cells (LECs).
- ◆ Chemical and environmental sensors.

### **Publications**

Dong Ryeol Whang,\* Dogukan Hazar Apaydin, Soo Young Park, and Niyazi Serdar Sariciftci, "An electron-reservoir Re(I) complex for enhanced efficiency for reduction of CO<sub>2</sub> to CO", Journal of Catalysis, accepted.

Dong Ryeol Whang\* and Dogukan Hazar Apaydin, "Artificial Photosynthesis: Learning from Nature", ChemPhotoChem, 2, 148 (2018) Front cover highlighted

Sang Kyu Park, Jin Hong Kim, Tatsuhiko Ohto, Ryo Yamada, Andrew Jones, Dong Ryeol Whang, Illhun Cho, Sangyoon Oh, Jeffrey Hong, Ji Eon Kwon, Jong H. Kim, Yoann Olivier, Roland Fischer, Roland Resel, Johannes Gierschner, Hirokazu Tada, Soo Young Park, "Highly Luminescent 2D-type Slab Crystals Based on a Molecular Charge-Transfer Complex as Promising Organic Light-Emitting Transistor Materials", Adv. Mater., 29, 1701346 (2018)

Min Seok Lee,<sup>†</sup> Dong Ryeol Whang,<sup>†</sup> Hyun-Jung Choi, Mun Ho Yang, Bong-Gi Kim, Jong-Beom Baek, Dong Wook Chang, "A facile approach to tailoring electrocatalytic activities of imine-rich nitrogen-doped graphene for oxygen reduction reaction", Carbon, 122, 515 (2017) <sup>†</sup>: equal contribution

Seolhee Jeon, Jung Hun Lee, Jai Il Park, Bonghyun Jo, Dong Ryeol Whang, Tae Kyu Ahn, Hui Joon Park, Sung Dong Kim, Wi Hyoung Lee, Bong-Gi Kim, "Manipulation of Chain Conformation for Optimum Charge Transport Pathway in Conjugated Polymers", ACS Applied Materials & Interfaces, 9, 22757 (2017)

Jincheol Kim, Youngmin You, Seong-Jun Yoon, Jong H. Kim, Boseok Kang, Sang Kyu Park, Dong Ryeol Whang, Jangwon Seo, Kilwon Cho, and Soo Young Park, "Bistable Solid-State Fluorescence Switching in Photoluminescent Infinitely Coordinated Polymer", Chem. Eur. J., accepted, (2017) DOI: 10.1002/chem.201701656

Sanghyuk Park, Ji Eon Kwon, Sun-Young Park, Oh-Hoon Kwon, Joon Ki Kim, Seong-Jun Yoon, Jong Won Chung, Dong Ryeol Whang, Sang Kyu Park, Dong Ki Lee, Du-Jeon Jang, Johannes Gierschner, and Soo Young Park, "Crystallization-Induced Emission Enhancement and Amplified Spontaneous Emission from CF<sub>3</sub>-containing Excited-State Intramolecular Proton Transfer Molecule", Adv. Opt. Mater., accepted, (2017)

Sella Kurni Putria, Yun Hwan Kim, Dong Ryeol Whang, Min Seok Lee, Joo Hyun Kim, Dong Wook Chang, "Step-by-step improvement in photovoltaic properties of fluorinated quinoxaline-based low-band-gap polymers", Org.

Elec., 47, 14 (2017)

Jaekwan Kim, Dong Ryeol Whang,\* Soo Young Park, "Designing Highly Efficient Cu<sup>I</sup> Photosensitizer for Photocatalytic H<sub>2</sub> Evolution from Water", ChemSusChem, 10, 1883-1886, (2017)

Junjie Cui, Ji Eon Kwon, Hyeong-Ju Kim, Dong Ryeol Whang, Soo Young Park, "Smart Fluorescent Nanoparticles in Water Showing Temperature-Dependent Ratiometric Fluorescence Color Change", ACS Appl. Mater. Interfaces, 9 (3), 2883-2890 (2017)

Won Sik Yoon, Dong Won kim, Jun-Mo Park, Illhun Cho, Oh Kyu Kwon, Dong Ryeol Whang, Jin Hong Kim, Jung-Hwa Park, Soo Young Park, "A Novel bis-Lactam Acceptor with Outstanding Molar Extinction Coefficient and Structural Planarity for Donor-Acceptor Type Conjugated Polymer", Macromolecules, 49 (22), 8489–8497, (2016)

Hyeong-Ju Kim, Dong Ryeol Whang, Johannes Gierschner, and Soo Young Park, "Highly Enhanced Fluorescence of Supramolecular Polymers Based on a Cyanostilbene Derivative and Cucurbit[8]uril in Aqueous Solution", Angew. Chem. Int. Ed., 55 (51), 15915–15919, (2016)

Dongha Kim, Dong Ryeol Whang,\* Soo Young Park\* "Self-Healing of Molecular Catalyst and Photosensitizer on Metal-Organic Framework: Robust Molecular System for Photocatalytic H<sub>2</sub> Evolution from Water", J. Am. Chem. Soc., 138 (28), 8698-8701, (2016)

Jin Hong Kim, Sang Kyu Park, Jong H. Kim, Dong Ryeol Whang, Won Sik Yoon, Soo Young Park, "Self-assembled organic single crystalline nanosheet for solution processed n-channel field-effect transistors", Adv. Mater., 28 (28), 6011-6015, (2016)

Hyeong-Ju Kim, Jin Hong Kim, Jangwon Seo, Jaehun Jung, Dong Ryeol Whang, and Soo Young Park, "Tuning the charge transport properties of dicyanodistyrylbenzene derivatives by the number of fluorine substituents", Synt. Met., 216, 51-58, (2016)

Sang Kyu Park, Ilhun Cho, Johannes Gierschner, Jinhong Kim, Jong H. Kim, Ji Eon Kwon, Oh Kyu Kwon, Dong Ryeol Whang, Jung-Hwa Park, Byeong-Kwan An, and Soo Young Park, "Stimuli-Responsive Reversible Fluorescence Switching in the Crystalline Donor-Acceptor Mixture Film: Mixed Stack Charge-Transfer Emission vs. Segregated Stack Monomer Emission", Angew. Chem. Int. Ed., 55(1), 203-207, (2016)

Dong Ryeol Whang and Soo Young Park, "Rational Design of Electron-Reservoir Pt<sup>II</sup> Complex for Highly Efficient Photocatalytic Hydrogen Production from Water", ChemSusChem, 8, 3204-3207, (2015)

Michael Wykes, Sang Kyu Park, Santanu Bhattacharyya, Shinto Varghese, Ji Eon Kwon, Dong Ryeol Whang, Ilhun Cho, Reinhold Wannemacher, Larry Lüer, Soo Young Park, Johannes Gierschner, "Excited State Feature and Dynamics in a Distyrylbenzene Based Mixed Stack Donor-Acceptor Co-Crystal with Luminescent Charge Transfer Characteristics", J. Phys. Chem. Lett., 6, 3682-3687, (2015)

Hyeong-Ju Kim, Dong Ryeol Whang, Johannes Gierschner, Chong Han Lee, Soo Young Park, "High-Contrast Red–Green–Blue Tricolor Fluorescence Switching in Bicomponent Molecular Film", Angew. Chem. Int. Ed., 54 (14), 4330-4333, (2015)

Mina Kim, Dong Ryeol Whang, Johannes Gierschner, Soo Young Park, "A Distyrylbenzene Based Highly Efficient Deep Red/Near-Infrared Emitting Organic Solid ", Journal of Materials Chemistry C, 3, 231-234, (2015) – Cover Highlighted

Dong Ryeol Whang, Ken Sakai, and Soo Young Park, "Highly Efficient Photocatalytic Water Reduction with Robust Iridium(III) Photosensitizers Containing Arylsilyl Substituents.", *Angew. Chem. Int. Ed.*, 52, 11612-11615 (2013)

Xiaolong Yang, Zuam Huang, Cheuk-Lam Ho, Guijiang, Dong Ryeol Whang, Chunliang Yao, Xianbin Xu, Soo Young Park, Chung Hin Chui, and Wai Yeung Wong, "Dynamic dualstage phosphorescence chromatic change in a diborylated iridium phosphor for fluoride ion sensing with concentration discriminating capability", *RSC Advances*, 6553-6563, (2013)

Dong Ryeol Whang, Youngmin You, Weon-Sik Chae, Jeongyun Heo, Sehoon Kim, and Soo Young Park, "Solid-State Phosphorescence-to-Fluorescence Switching in a Cyclometalated Ir(III) Complex Containing an Acid-Labile Chromophoric Ancillary Ligand: Implication for Multimodal Security Printing", *Langmuir*, 6;28,(44),15433-7, (2012)

Jeongyun Heo, Chang-Keun Lim, Dong Ryeol Whang, Jiyoung Shin, Seo Young Jeong, Soo Young Park, Ick Chan Kwon, and Sehoon Kim, "Self-Deprotonation and Colorization of 1,3-Bis(dicyanomethylidene)indan in Polar Media: A Facile Route to a Minimal Polymethine Dye for NIR Fluorescence Imaging ", *Chem. Eur. J.*, 18(28), 8699-8704, (2012)

Xu Lin, Shiki Yagai, Akihide Kitamura, Dong Ryeol Whang, Soo Young Park, Young-Seo Park, Jang-Joo Kim, and Takashi Karatsu, "Small molecular host based on carbazole and m-terphenyl derivatives for efficient solution processed organic light-emitting diodes", *Synth. Met.*, 162(3-4), 303-308, (2012)

Yunoh Jung, Jangwon Seo, Jong H. Kim, Dong Ryeol Whang, Se Hoon Ghim, Chong Rae Park, and Soo Young Park, "Fabrication of aligned microwire arrays of perylene bisimide by micromolding in capillary", *Synth. Met.*, 160, 1287-1290, (2010)

Dong Ryeol Whang, Youngmin You, Se Hun Kim, Won-Ik Jeong, Young-Seo Park, Jang-Joo Kim, and Soo Young Park, "A Highly Efficient Wide-bandgap Host Material for Blue Electrophosphorescent Light-emitting Devices", *Appl. Phys. Lett.*, 91, 233501, (2007)

### **Presentations**

Dong Ryeol Whang, Soo Young Park, Serdar Niyazi Sariciftci, "Artificial Photosynthesis: Learning from Nature", LIKAT-INCA Symposium, 2018-02-23

Dong Ryeol Whang, Soo Young Park, Serdar Niyazi Sariciftci, "Artificial Photosynthesis: Learning from Nature", Conference on Progress in Organic Optoelectronics, 2017-12-19

Dong Ryeol Whang, Dogukan Hazar Apaydin, Soo Young Park, and Niyazi Serdar Sariciftci, "Electron Reservoir Re(I) Complex for Electrocatalytic/Photocatalytic CO<sub>2</sub> Reduction: Role of the Arylsilyl-Substituents", Faraday Discussion on Artificial Photosynthesis, 2017-02-28

Dong Ryeol Whang, "Accumulative Charge Transfer for Artificial Photosynthesis (APS)", Europe-Korea Conference on Science and Technology 2017, 2017-07-28

Dong Ryeol Whang and Soo Young Park, "Supramolecular Approaches for Solar Hydrogen Production from Water",

International Symposium on Construction and Application of Functional Molecules/Systems, 2015-10-21

Dong Ryeol Whang and Soo Young Park, "Developing Electron-Reservoir Pt(II) Complex for Highly Efficient Photocatalytic Hydrogen Production from Water", 25<sup>th</sup> International Conference on Photochemistry, 2015-07-02

Jaekwan Kim, Dong Ryeol Whang, Soo Young Park, "Utilizing multi-electron storage in Ir(III) photosensitizers for photocatalytic hydrogen production from water", 7<sup>th</sup> Chemosensor Symposium, Korea, 2015-01-23

Dong Ryeol Whang, Soo Young Park, "Ir(III) homonuclear dyad as an efficient photosensitizer for visible light-driven photocatalytic water reduction", CEMSupra 2014, Japan, 2014-12-13

Dong Ha Kim, Dong Ryeol Whang, Soo Young Park, "Bifunctional Metal-Organic Framework for a Highly Robust Single-Component Photo-Hydrogen-Evolving Device", Faraday Discussion 176, China, 2014-10-27

Dong Ryeol Whang, Soo Young Park, "An Ir(III)-Pt(II) supramolecular device for highly efficient visible light driven hydrogen production from water : Beyond molecules", Faraday Discussion 176, China, 2014-10-27

Dong Ryeol Whang and Soo Young Park, "Effect of Electronic and Steric Modification of Ir(III) Photosensitizers on Their Photocatalytic Water Reduction Properties", The 2013 Korea-Japan Symposium on Frontier Photoscience, Hoam Convention Center, Seoul, Korea, 2013-11-27

Dong Ryeol Whang, Seung Chan Ryu, Youngkwang Kim, and Soo Young Park, "Supramolecularly-Caged Ir(III) Photosensitizers for Highly Efficient Photocatalytic Water Reduction", The 2013 Korea-Japan Symposium on Frontier Photoscience, Hoam Convention Center, Seoul, Korea, 2013-11-25

Dong Ryeol Whang and Soo Young Park, "Robust Visible-Light Driven Photocatalytic Water Reduction System: Role of the Arylsilyl-Substituents", KJF-ICOMEF 2013, Busan, Korea, 2013-08-29

Dong Ryeol Whang and Soo Young Park, "Robust photocatalytic water reduction with dendritic Ir(III) complexes; role of the arysilyl-substituents", 2012 Korean Chemical Society Fall Meeting, BEXCO, Korea, 2012-10-17

Seung Chan Ryu, Dong Ryeol Whang, and Soo Young Park, "Enhanced stability of photocatalytic water reduction system based on a supramolecularly-caged Ir(III) complex", 2012 Korean Chemical Society Fall Meeting, BEXCO, Korea, 2012-10-17

Dong Ryeol Whang, Youngmin You, and Soo Young Park, "Switching of phosphorescence to fluorescence in the Ir(III) complex with acid-labile ancillary ligand", 243RD American Chemical Society National Meeting & Exposition, San Diego, California, 2012-03-27

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Seung Chan Ryu, Youngmin You, Dong Ryeol Whang, and Soo Young Park, "Fluorescence Color Tuning of Infinitely Coordinated Polymers by Interligand Energy Transfer and Solid State Sensing Applications", 4th Chemosensor Symposium, chuncheon, Korea, 2012-01-17

Myung Hyun Jo, Dong Ryeol Whang, Se Hoon Kim, and Soo Young Park, "Triphenylsilane containing solution-processable small-molecular host for highly efficient phosphorescent organic light-emitting diodes", KJF-ICOMEF

2011, Kyeongju, Korea, 2011-09-15

Dong Ryeol Whang, Youngmin You, and Soo Young Park, "Fluorescence From Cyclometalated Ir(III) Complexes: Modulation of Singlet and Triplet Emissions by Interaction with Hg(II) Ion", KJF-ICOMEF 2011, Kyeongju, Korea, 2011-09-15

Dong Ryeol Whang and Soo Young Park, "Phosphorescent Organic Light-Emitting Devices with Boron-Containing Ir(III) Electrophosphor: Lower Roll-Off Efficiency and Higher Doping Level", 2010 Korean Chemical Society Spring Meeting, Songdo, Korea, 2010-04-29

Dong Ryeol Whang, Youngmin You, and Soo Young Park, "Mechanism of Highly Selective Hg<sup>2+</sup> Ion Sensing for the Phosphorescent Ir(III) Complexes with Acetylacetonate Ancillary Ligands", 1st Chemosensor Symposium, Seoul, Korea, 2010-01-14

Soo Young Park, Youngmin You, and Dong Ryeol Whang, "Phosphorescent Ir(III) Complexes For Selective Ion Sensing", 1st Chemosensor Symposium, Seoul, Korea, 2010-01-14

Dong Ryeol Whang, Youngmin You, and Soo Young Park, "Phosphorescent Organic Light-Emitting Devices with Boron-Containing Dendritic Ir(III) Electrophosphor: Lower Roll-Off Efficiency and Higher Doping Level", 11th Pacific Polymer Conference 2009, Cairns, Australia, 2009-12-06

Soo Young Park, Youngmin You, and Dong Ryeol Whang, "Phosphorescent Ir(III) Complexes for Selective Ion Sensing", ISPPCC 2009, Gateaux Kingdom Sapporo Hotel, Japan, 2009-07-04

Dong Ryeol Whang, Youngmin You, and Soo Young Park, "Selective Mercury Ion-Sensing with Phosphorescent Ir(III) Complexes", 2008 MRS Fall meeting, Boston, MA, USA, 2008-12-01

Jae Joon Jo, Youngmin You, Dong Ryeol Whang, and Soo Young Park, "Selectiv Cu ion sensing with phosphorescent polymer", The 2008 Korea-Japan Symposium on Frontier Photoscience, Ramada Plaza Hotel, Jeju, Korea, 2008-09-25

Dong Ryeol Whang and Soo Young Park, "Selective Mercury Ion-Sensing with Phosphorescent Ir(III) Complexes", 2008 Korean Chemical Society Spring Meeting, KINTEX, Korea, 2008-04-17

Dong Ryeol Whang and Soo Young Park, "Side-Chain Polymers with Novel Phosphorescent Ir(III) Complexes: Energy Harvesting and Interligand Energy Transfer", 2008 Polymer Society of Korea Spring Meeting, Daejeon Convention Center, Korea, 2008-04-10

Dong Ryeol Whang and Soo Young Park "Wide Bandgap Host Material for Blue Electrophosphorescent Light-emitting Devices", 2007 Polymer Society of Korea Spring Meeting, Jaeju ICC, Korea, 2007-04-12

### **Patent**

Dong Ryeol Whang and Soo Young Park, "Organometallic photocatalyst and method for generating hydrogen using thereof", KR [10-2013-0093828], registered

Dong Ryeol Whang, Seungchan Ryu, and Soo Young Park, "Organometallic complex and method for generating hydrogen using thereof", KR [10-2012-0115213], published