CURRICULUM VITAE

윤원섭 (WON-SUB YOON)

WORK EXPERIENCE

Sep. 2011 – Present	Professor 성균관대학교 에너지과학과
Mar. 2008 – Aug.2011	Assistant/Associate Professor 국민대학교 공과대학 신소재공학부
Oct. 2006 – Mar. 2008	Associate Scientist Job: In-situ analysis of catalyst for fuel cell and electrode materials for Li battery using synchrotron-based X-ray techniques. Developing new electrode materials for rechargeable lithium batteries and fuel cells. Chemistry Department, Brookhaven National Laboratory NY11973, USA
Apr. 2004 – Sep. 2006	Assistant Scientist Job: In-situ analysis of catalyst for fuel cell and electrode materials for Li battery using synchrotron-based X-ray techniques. Developing new electrode materials for rechargeable lithium batteries and fuel cells. Chemistry Department, Brookhaven National Laboratory NY11973, USA
Nov. 2002 – Mar. 2004	Research Associate Job: Developing new electrode materials for rechargeable lithium batteries. In-situ analysis of electrode materials for Li battery using synchrotron-based X-ray techniques. Materials Science Department, Brookhaven National Laboratory NY11973, USA, Supervisor: Dr. James McBreen
Nov. 2001 – Nov. 2002	Post-doctoral Research Fellow Job: Combined Synchrotron-based in-situ X-ray technique and Magic Angle Spinning (MAS)-Nuclear Magnetic Resonance (NMR)technique to probe the local structure of cathode materials for lithium rechargeable batteries. Chemistry Department, State University of New York at Stony Brook, NY11794, USA, Supervisor: Prof. Clare P. Grey
Mar. 2001 – Oct. 2001	Associate Researcher

Job: Developing new electrode materials for rechargeable lithium batteries and supercapacitors. Structural characterization of transition metal oxides using synchrotron-based X-ray techniques.
Engineering Research Institute, Yonsei University, Seoul, South Korea
Supervisor: Prof. Kwang-Bum Kim

EDUCATION

Mar. 1997 – Feb. 2001	Yonsei University, Seoul, Korea Ph. D. in Metallurgical Engineering Thesis title: A study on the capacity fading and cyclability enhancement of $LiAl_yCo_{1-y}O_2$ cathode for Li rechargeable batteries Thesis advisor: Prof. Kwang-Bum Kim
Mar. 1995 – Feb. 1997	Yonsei University, Seoul, Korea M. S. in Metallurgical Engineering Thesis title: A study on the superactivation behaviors of Al-Ga alloys in alkaline solution Thesis advisor: Prof. Kwang-Bum Kim
Mar. 1988 – Feb. 1995,	Yonsei University, Seoul, Korea B.S. in Metallurgical Engineering

CURRENT RESEARCH

- In-situ Analysis of electrode materials for Li battery using synchrotron-based X-ray technique
- In-situ Analysis of catalyst for fuel cells using synchrotron-based X-ray technique
- Analysis of electrode materials for Li battery using MAS-NMR technique
- Development of new electrode materials for rechargeable lithium batteries and supercapacitors.
- Development of new electrode materials for fuel cells.
- Electronic and local structure characterization of transition metal oxides.
  (Soft X-ray Absorption Spectroscopy, XANES, EXAFS, MAS-NMR)
- Structural characterization of transition metal oxides.
  (XRD, Neutron Diffraction, Rietveld analysis, TG-DTA, ICP, SEM, TEM etc.)
- Electrochemical characterization of transition metal oxides.
  (Cyclic Voltammetry, Cycling test, EIS, EVS, GITT, PITT)
- Development of the novel synthesis procedures (Soft chemistry route)
- Synthesis of transition metal oxide thin film electrode by Electrostatic Spray Deposition for rechargeable lithium batteries and supercapacitors.

HONORS AND AWORDS

- selected as Science Highlight Story in National Synchrotron Light Source (NSLS) Activity Report 2003
- has been reviewing DOE's Small Business Innovation Research (SBIR)/Small Business technology transfer (STTR) proposal
- has been serving as reviewer in "Electrochimica Acta", "Journal of Power Sources", "Physical Review B", "Chemistry of Materials", "Journal of the Electrochemical Society" and "Electrochemical and Solid-State Letters"
- featured in BNL webpage for Li rechargeable battery research using synchrotron-based X-ray, 2006
- invited and co-chaired in the Electrochemical Society Meetings.
- selected as The Marquis Who's Who in Science and Engineering 2008-2009.
- selected as Top 25 hottest articles in Electrochemistry Communications in 2008
- The Ministry of Knowledge Economy ministerial citation in 2012
- WPM (World Premier Materials) Technology Competition the Gold Award in 2014
- Samsung Humantech Gold Award in 2015
- Pohang Accelerator Laboratory Science in 2015

PERFORMED RESEARCHES (Conducted as Principal Investigator)

- In Situ Soft X-ray Absorption Spectroscopy Studies of Cathode Materials for Thin Film Lithium-Ion Batteries, the Laboratory Directed Research and Development (LDRD) Program, BNL.
- Battery Materials: Structure and Characterization, Batteries for Advanced Transportation Technologies (BATT) Program, U.S. Department of Energy Office of FreedomCAR and Vehicle Technologies.
- Diagnostic Evaluations for High Power Li Rechargeable Batteries, Advanced Technology Development (ATD) program, U.S. Department of Energy Office of FreedomCAR and Vehicle Technologies.
- Characterization of Cathode Materials for Rechargeable Lithium Batteries using Synchrotron based in situ X-ray technique, LG Chemical.

PROFESSIONAL MEMBERSHIP

- The Electrochemical Society
- American Chemical Society
- Materials Research Society
- The International XAFS Society

RECENT PUBLICATIONS

1. Hyunwoo Kim, Woosung Choi, Jaesang Yoon, Ji Hyun Um, Wontae Lee, Jaeyoung Kim, Jordi Cabana, **Won-Sub Yoon**, "Exploring Anomalous Charge Storage in Anode Materials for Next-Generation Li Rechargeable Batteries", ***Chemical Reviews***, **2020, Accepted**

2. Wontae Lee, Shoaib Muhammad, Chernov Sergey, Hayeon Lee, Jaesang Yoon, Yong-Mook Kang, **Won-Sub Yoon**, "Advances in the Cathode Materials for Making a Breakthrough in the Li Rechargeable Batteries", ***Angewante Chemie International Edition,*** **2019, 59, 2578-2605**

3. Mi Ru Jo, Yunok Kim, Junghoon Yang, Mihee Jeong, Kyeongse Song, Yong-Il Kim, Jin-Myoung Lim, Maenghyo Cho, Jae-Hyun Shim, Young-Min Kim, **Won-Sub Yoon** & Yong-Mook Kang, "Triggered Reversible Phase Transformation between Layered and Spinel Structure in Manganese-based Layered Compounds", ***Nature communications,*** **2019, 10, 3385**

4. Ji Hyun Um, Kowsalya Palanisamy, Mihee Jeong, Hyunchul Kim, **Won-Sub Yoon**, "Phase Dynamics on Conversion-Reaction Based Tin-Doped Ferrite Anode for Next Generation Lithium Batteries", ***ACS Nano*** **2019, 13, 5674-5685**

5. Yunok Kim, Jaeseung Yoo, Donghyuk Jang, Shoaib Muhammad, Mihee Jeong, Woosung Choi, **Won-Sub Yoon**, "Further utilization of a Mn redox reaction via control of structural disorder in olivine systems", ***Journal of Materials Chemistry A,*** **2018, 13743**

6. Hyunchul Kim, Woon Ih Choi, Yoonjung Jang, Mahalingam Balasubramanian, Wontae Lee, Gwi Ok Park, Su Bin Park, Jaeseung Yoo, Jin Seok Hong, Youn-Suk Choi, Hyo Sug Lee, In Tae Bae, Ji Man Kim, and **Won-Sub Yoon**, "Exceptional Lithium Storage in a Co(OH)2 Anode: Hydride Formation", ***ACS Nano*** **2018, 12, 2909-2921**

7. Insang Hwang, Sung-Kyun Jung, Eun-Suk Jeong, Hyunchul Kim, Sung-Pyo Cho, Kyojin Ku, Hyungsub Kim, **Won-Sub Yoon**, Kisuk Kang, "NaF–FeF2 nanocomposite: New type of Na-ion battery cathode material", ***Nano Research,*** **(2017), 10, 4388-4397**

8. Gwi Ok Park, Jeongbae Yoon, Su Bin Park, Zhenghua Li, Yun Seok Choi, **Won-Sub Yoon**, Hansu Kim, Ji Man Kim, "Nanostructural Uniformity of Ordered Mesoporous Materials: Governing Lithium Storage Behaviors", ***Small,*** **(2017), 1702985**

9. Wontae Lee, Shoaib Muhammad, Taewhan Kim, Hyunchul Kim, Eunkang Lee, Mihee Jeong, Suhan Son, Jae-Hyun Ryou, **Won-Sub Yoon**, "New insight into Ni-rich layered structure for next-generation Li rechargeable batteries", ***Advance Energy Material,*** **2017, 1701788**

10. Sung-Kyun Jung, Hyunchul Kim, Min Gee Cho, Sung-Pyo Cho, Byungju Lee, Hyungsub Kim, Young-Uk Park, Jihyun Hong, Kyu-Young Park, Gabin Yoon, Won Mo Seong, Yongbeom Cho, Myoung Hwan Oh, Haegyeom Kim, Hyeokjo Gwon, Insang Hwang, Taeghwan Hyeon, **Won-Sub Yoon**, Kisuk Kang, "Lithium-free transition metal monoxides for positive electrodes in lithium-ion batteries", ***Nature Energy*****, 2, (2017), 16208**

PATENT

1. **Won-Sub Yoon**, Kyung-Keun Lee, and Kwang-Bum Kim, "Cathode Active Material Using Sol-Gel Method, Preparing Method Thereof and The Composite Cathode Using the Same", Korean Patent No. 10-0388633, 2003.

2. **윤원섭**, 최아름, 코살리아 팔라니사미, 김윤옥, 김광범, "리튬 망간 산화물-탄소 나노 복합체 및 이의 제조 방법" 출원번호: 10-2014-0000915, 본교관리번호: R-2013-0518-KR-1, 등록 번호: 10-1465213, 출원일: 2014.01.03, 인력양성, 기후변화 사사

3. "Nanoporous Cobalt Hydroxide Material for Lithium Battery", Ji Man Kim, **Won-Sub Yoon**, Hyunchul Kim, Gwi Ok Park, Su Bin Park, South Korea Patent 10-2016-0115145, issued September 7, 2016.

BOOK

1. Shoaib Muhammad, Hyunchul Kim, **Won-Sub Yoon***, "X-ray Characterization of Nanostructured Energy Materials by Synchrotron Radiation (Synchrotron Radiation-Based X-Ray Study on Energy Storage Materials)", published date: Mar 22nd 2017, ISBN: 978-953-51-3014-7, DOI: 10.5772/67029