

CURRICULUM VITAE

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EDUCATION

Clemson University	Ph.D	Department of Ceramic Eng.	1991
Virginia Polytechnic Inst. and State Univ.	ME	Materials Sci. and Eng.	1988
Hanyang University	BS	Ceramic Engineering	1986

PROFESSIONAL ACTIVITIES

- Minister, Ministry of Trade, Industry and Energy, Republic of Korea (2017 – 2018)
- Representative Director, S-oil, Korea (2019-Present)
- Editorial Board, Scientific Report (2016 - Present)
- Editorial Board, ISRN Ceramics (2011 – Present)
- Professor, Department of Energy Engineering, Hanyang University (2009 – Present)
- Associate Member, The Korean Academy of Science and Technology (2008 – Present)
- Associate Member, Ministry of Science, ICT and Future Planning (2014 –2017)
- Dean, 3rd college of Engineering, Hanyang University (2017)
- Dean, Department of Energy Engineering, Hanyang University (2015 – 2017)
- Director, BK21+ Future Fusion Energy Leaders (2015 – 2017)
- Academic Executive Director, Korean Ceramic Society (2008 – 2008)
- Director, Global Research Laboratory (2007-2016)
- Technology counsellor, SK Hynix semiconductor, Korea (2006 - 2017)
- Technology counsellor, Samsung SDI (2006 - 2017)
- Director, National Research Laboratory (2001 – 2006)
- Professor, Department of Material Science & Engineering, Hanyang University (1999 – 2009)
- Associate Professor, Department of Materials Engineering, Changwon National University, Changwon (1992 – 1999)
- Researcher, National Institute of Standards and Technology, Gaithersburg, MD, (1991 – 1992)

AWARD AND HONORS

- Minister's Award from the Ministry of Science, ICT and Future Planning (2016)
- 2011 One of 100 people who will lead Korea after 10 years by Dong-A Newspaper (2011)
- The Great Scholar Award from Hanyang University(2009)
- Scientist of the Month Award from Korea Science and Engineering Foundation(2008)
- Minister's Award from the Ministry of Commerce, Industry and Energy of Korea for the improvement of power industries(2007)
- The Distinguished Professor Award from Hanyang University for the establishment of research competitive power(2007)

Technology transfer

- Development of low dishing CMP slurry for STI CMP, 2015, KCTech
- Development of CMC binder for the graphite anode materials of lithium ion battery, 2013, Ashland Specialty Ingredients G.P.
- Development of CMC binder for the graphite anode materials of lithium ion battery, 2012, Ashland Specialty Ingredients G.P.
- Development of thermal barrier coating technology for gas turbine combustion liner and transition piece, 2012, KOSPO
- Development of thermal barrier coating technology for gas turbine combustion liner and transition piece, 2010, KOSPO
- Development of non-volatile memory device with nanocrystals layer embedded in conducting polymer, 2008, Samsung advanced institute technology.
- Development of ILD slurry preparation technology, 2002, Techno Semichem.
- Development of STI slurry preparation technology, 2002, KC Tech

Selected Publications

1. Advantageous Crystalline-Amorphous Phase Boundary for Enhanced Electrochemical Water Oxidation. *Energy & Environmental Science*. 2019
2. Metal Organic Framework Derived Materials: Progress and Prospects for the Energy Conversion and Storage, *Advanced Materials*, 2018, 30(39), 1705146.
3. Carbon coated porous nickel phosphides nanoplates for highly efficient oxygen evolution reaction, *Energy Environ. Sci.*, 2016, 9, 1246.
4. Soft skin mounted power management systems and their use in wireless thermography, *PNAS*, 2016, 113(22):6131-6.
5. Formation of Ni-Co-MoS₂ Nanoboxes with Enhanced Electrocatalytic Activity for Hydrogen Evolution, *Advanced Materials*, 2016, 28(40), 9006-9011.
6. Soft network composite materials with deterministic and bio-inspired designs, *Nature Communications*, 2015, 6, 6566.
7. Assembly of micro/nanomaterials into complex, three-dimensional architectures by compressive buckling, *Science*, 2015, 347 (6218), 154-159.

- 8. Stretchable batteries with self-similar serpentine interconnects and integrated wireless recharging systems, *Nature Communications*, 2013, 4, 1543.
- 9. GaAs photovoltaics and optoelectronics using releasable multilayer epitaxial assemblies, *Nature*, 2010, 465 (7296), 329-333.
- 10. Arrays of sealed silicon nanotubes as anodes for lithium ion batteries, *Nano letters*, 2010, 10, 1710.

(> 330 SCI papers)