HSIN-CHE LU

Field of Study: Chemical Engineering

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Education

- **University of Texas at Austin (UT)** — **Austin, Texas, US**
  Doctor of Philosophy, Major: Chemical Engineering — 8.2017-present
- **National Taiwan University (NTU)** — **Taipei, Taiwan**
  Master of Science, Major: Chemical Engineering — 9.2014-6.2016
  Bachelor of Science in Engineering, Major: Chemical Engineering — 9.2010-6.2014

Research Experience

- **Milliron Research Group, UT, US (Advisor: Delia Milliron, Ph.D.):**
  Graduate Research Assistant — 10.2017-present
- **EOM Lab, NTU, Taiwan (Advisor: Kuo-Chuan Ho, Ph.D.):**
  Full-Time Research Assistant — 10.2016-present
  Bachelor's and Master's Researches — 7.2013-6.2016
- **EFMG, NIMS, Japan (Advisor: Masayoshi Higuchi, Ph.D.):**
  Visiting Researcher — 6.2016-9.2016

Publications

- **Journal Articles (8)**

1. **H. C. Lu**, S. Y. Kao, H. F. Yu, T. H. Chang, C. W. Kung, and K. C. Ho*, Achieving low-energy driven viologens-based electrochromic devices utilizing polymeric ionic liquids. **ACS Appl. Mater. Interfaces 2016**, 8, 30351–30361.
2. **H. C. Lu**, S. Y. Kao, T. H. Chang, C. W. Kung, and K. C. Ho*, An electrochromic device based on Prussian blue, self-immobilized vinyl benzyl viologen, and ferrocene. **Sol. Energy Mater. Sol. Cells 2016**, 147, 75–84.
3. T. H. Chang, **H. C. Lu**, M. H. Lee, S. Y. Kao, K. C. Ho*, Multi-color electrochromic devices based on phenyl and heptyl viologens immobilized with UV-cured polymer electrolyte. **Sol. Energy Mater. Sol. Cells 2017**, doi.org/10.1016/j.solmat.2017.05.004.
4. H. F. Yu, S. Y. Kao, **H. C. Lu**, Y. F. Lin, H. Feng, H. W. Pang, R. Vittal, J. L. Lin*, K. C. Ho*, Electrospun nanofibers composed of poly(vinylidene fluoride-co-hexafluoropropylene) and poly(oxyethylene)-imide imidazolium tetrafluoroborate as electrolytes for solid-state electrochromic devices. **Sol. Energy Mater. Sol. Cells 2017**,

doi.org/10.1016/j.solmat.2017.06.033.

5. L. M. Huang*, C. Y. Peng, C. W. Hu, **H. C. Lu**, C. H. Chen, D. J. Yang, C. C. Kuo, K. C. Ho, Spectroelectrochemical and adhesion properties of chemically synthesized ion conducting poly (vinyl butyral) in Prussian blue and poly (3, 4-ethylenedioxythiophene) laminated electrochromic glazing, **Sol. Energy Mater. Sol. Cells 2017**, 171, 258–266.
6. S. Y. Kao, **H. C. Lu**, C. W. Kung, H. W. Chen, T. H. Chang, and K. C. Ho*, Thermally cured viologen-based all-in-one electrochromic devices with panchromatic modulation. **ACS Appl. Mater. Interfaces 2016**, 8, 4175–4184.
7. C. H. Su, C. W. Kung, T. H. Chang, **H. C. Lu**, K. C. Ho*, and Y. C. Liao*, Inkjet-printed porphyrinic metal-organic framework thin films for electrocatalysis. **J. Mater. Chem. A 2016**, 4, 11094–11102.
8. T. H. Chang, C. W. Kung, H. W. Chen, T. Y. Huang, S. Y. Kao, **H. C. Lu**, M. H. Lee, K. M. Boopathi, C. W. Chu*, and K. C. Ho*, Planar heterojunction perovskite solar cells incorporating metal-organic framework nanocrystals. **Adv. Mater. 2015**, 27, 7229–7235.

- **Conference Presentations (4)**

1. **H. C. Lu**, S. Y. Kao, K. C. Ho*, 12th International Meeting on Electrochromism, Delft, The Netherlands, August 2016. (**Invited talk, speaker: K. C. Ho, Ph.D.**)
2. **H. C. Lu**, T. H. Chang, C. W. Kung, S. Y. Kao, and K. C. Ho*, 66th Annual Meeting - International Society of Electrochemistry, Taipei, Taiwan, October 2015. (**Poster**)
3. **H. C. Lu**, S. Y. Kao, T. H. Chang, C. W. Kung, and K. C. Ho*, 227th The Electrochemical Society Meeting, Chicago, U.S., May 2015. (**Oral presentation**)
4. **H. C. Lu**, C. W. Hu, S. Y. Kao, T. H. Chang, M. K. Leung, and K. C. Ho*, 11th International Meeting on Electrochromism, Taipei, Taiwan, August 2014. (**Poster**)

Research Interests

- **Electrochemistry:**

  Voltammetry, amperometry, potentiometry, RDE, EIS and *etc*.

  (a) Electrochromic materials & devices

  Electrochromism of metal-oxide nanocrystals, viologens, metallo-supramolecular polymers, Prussian blue analogues and the devices based on these materials

  (b) Electrocatalysis: OER, ORR, electrochemical biosensor
- **Perovskite solar cells**
- **Material synthesis:**

  (a) Organic Synthesis: Viologens, metallo-supramolecular polymers

  (b) Solution-Phase Synthesis: Prussian blue analogues, perovskites, metal-organic frameworks
- **Thin film processing:** Electro-deposition/polymerization, spin-coating, spray-coating

Honors

- **UT Fellowship**
  - **Phillips 66 Fellowship** (awarded: Fall, 2017)
  - **Provost's International Graduate Excellence Fellowship** (awarded: Fall, 2017)
  - **Cockrell School of Engineering Fellowship** (awarded: Fall, 2017)
  - **The McKetta Department of Chemical Engineering Fellowship** (awarded: Fall, 2017)
- **International Cooperative Graduate School Fellowship** (NIMS & NTU) (awarded: 5.2016)
- **Presidential Award** (NTU) (awarded: Fall, 2012 & Spring, 2013)

Work, Teaching, and Volunteer Experience

- Full-time Research Assistant in EOM Lab, NTU, Taiwan 10.2016-7.2017
- Private Tutor, Taipei, Taiwan 7.2012-6.2014
- Member of NTU volunteer club (NTUsunnycoconut), Taipei, Taiwan 9.2010-6.2014