



## Professor Yung-Jung Hsu

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### **Education:**

Ph.D. in Chemical Engineering, National Tsing Hua University, Taiwan.  
B.S. in Chemical Engineering, National Tsing Hua University, Taiwan.

### **Professional Appointments:**

Professor, Department of Materials Science and Engineering, National Chiao Tung University, Taiwan (2014 till now)  
Associate Professor, Department of Materials Science and Engineering, National Chiao Tung University, Taiwan (2010-2014)  
Assistant Professor, Department of Materials Science and Engineering, National Chiao Tung University, Taiwan (2007-2010)  
Associate Editor, Journal of the Taiwan Institute of Chemical Engineers (2017~2018)  
Reviewer Panel, RSC Advances (2018~now)  
Guest Editor for Special Issue "Metal–Semiconductor Nanoheterostructures for Photocatalysis Application", *Molecules* (2019)  
Director, Office of International Affairs, College of Engineering, National Chiao Tung University (2018~now)

### **Research Interests**

- Semiconductor Nanoheterostructures
- Surface and Colloidal Chemistry
- Photochemistry and Photocatalysis
- Interfacial Charge Carrier Dynamics
- Ultrafast Laser Spectroscopy

### **Recent 5-year Publications (2014~2019)**

- (1) Yi-Hsuan Chiu, Ting-Hsuan Lai, Ming-Yu Kuo, Ping-Yen Hsieh, Yung-Jung Hsu\*, "Photoelectrochemical Cells for Solar Hydrogen Production: Challenges and Opportunities", *APL Materials* **2019**, *accepted*, DOI: 10.1063/1.5109785 (Invited Perspective, promoted as Feature Article)
- (2) Yi-Hsuan Chiu, Sara Bonabi Naghadeh, Sarah A. Lindley, Ting-Hsuan Lai, Ming-Yu Kuo, Kao-Der Chang, Jin Z. Zhang\*, Yung-Jung Hsu\*, "Yolk-shell nanostructures as an emerging photocatalyst paradigm for solar hydrogen generation", *Nano Energy* **2019**, *62*, 289-298.
- (3) Yi-Hsuan Chiu, Tso-Fu Mark Chang\*, Chun-Yi Chen\*, Masato Sone, Yung-Jung Hsu\*, "Mechanistic Insights into Photodegradation of Organic Dyes Using Heterostructure Photocatalysts", *Catalysts* **2019**, *9*, 430 (Invited Review).
- (4) Mingqing Wang, Yung-Shan Chang, Chun-Wen Tsao, Mei-Jing Fang, Yung-Jung Hsu\*, Kwang-Leong Choy\*, "Enhanced Photoelectrochemical Hydrogen Generation in Neutral Electrolyte using Non-vacuum Processed CIGS Photocathodes with Earth Abundant Cobalt Sulfide Catalyst", *Chemical Communications* **2019**, *55*, 2465-2468.
- (5) Ping-Yen Hsieh, Yi-Hsuan Chiu, Ting-Hsuan Lai, Mei-Jing Fang, Yu-Ting Wang, Yung-Jung Hsu\*, "TiO<sub>2</sub> Nanowires-Supported Sulfides Hybrid Photocatalysts for Durable Solar Hydrogen Production", *ACS Applied Materials & Interfaces* **2019**, *11*, 3006-3015. (selected as the Supplementary Cover story)
- (6) Ming-Yu Kuo, Chih-Feng Hsiao, Yi-Hsuan Chiu, Ting-Hsuan Lai, Mei-Jing Fang, Jhen-Yang Wu, Jhih-Wei Chen, Chung-Lin Wu, Kung-Hwa Wei, Hsin-Chieh Lin\*, and Yung-Jung Hsu\*, "Au@Cu<sub>2</sub>O core@shell nanocrystals as dual-

functional catalysts for sustainable environmental applications", *Applied Catalysis B: Environmental* **2019**, 242, 499-506.

(7) Ying-Chih Pu\*, Wei-Ta Chen, Mei-Jing Fang, Yu-Lin Chen, Kai-An Tsai, Wei-Hao Lin, Yung-Jung Hsu\*, "Au-Cd<sub>1-x</sub>Zn<sub>x</sub>S core-alloyed shell nanocrystals: boosting the interfacial charge dynamics by adjusting the shell composition", *Journal of Materials Chemistry A* **2018**, 6, 17503-17513.

(8) Yi-Hsuan Chiu, Ting-Hsuan Lai, Chun-Yi Chen\*, Ping-Yen Hsieh, Kazunari Ozasa, Mitsuo Niinomi, Kiyoshi Okada, Tso-Fu Mark Chang\*, Nobuhiro Matsushita, Masato Sone, Yung-Jung Hsu\*, "Fully Depleted Ti-Nb-Ta-Zr-O Nanotubes: Interfacial Charge Dynamics and Solar Hydrogen Production", *ACS Applied Materials & Interfaces* **2018**, 10, 22997-23008. (selected as the Front Cover story)

(9) Yi-Hsuan Chiu, Kao-Der Chang, Yung-Jung Hsu\*, "Plasmon-mediated charge dynamics and photoactivity enhancement for Au-decorated ZnO nanocrystals", *Journal of Materials Chemistry A* **2018**, 6, 4286-4296. (featured as the 2018 JMCA HOT papers; selected as the Front Cover story)

(10) Yung-Shan Chang, Mingi Choi, Minki Baek, Ping-Yen Hsieh, Kijung Yong\*, Yung-Jung Hsu\*, "CdS/CdSe co-sensitized brookite H:TiO<sub>2</sub> nanostructures: charge carrier dynamics and photoelectrochemical hydrogen generation", *Applied Catalysis B: Environmental* **2018**, 225, 379-385.

(11) Yi-Hsuan Chiu, Yung-Jung Hsu\*, "Au@Cu<sub>7</sub>S<sub>4</sub> yolk@shell nanocrystal-decorated TiO<sub>2</sub> nanowires as an all-day-active photocatalyst for environmental purification", *Nano Energy* **2017**, 31, 286-295.

(12) Ying-Chih Pu\*, Hsin-Ying Chou, Wen-Shuo Kuo, Kung-Hwa Wei, Yung-Jung Hsu\*, "Interfacial charge carrier dynamics of cuprous oxide-reduced graphene oxide (Cu<sub>2</sub>O-rGO) nanoheterostructures and their related visible-light-driven photocatalysis", *Applied Catalysis B: Environmental* **2017**, 204, 21-32.

(13) Jing-Mei Li, Hao-Yun Cheng, Yi-Hsuan Chiu, Yung-Jung Hsu\*, "ZnO-Au-SnO<sub>2</sub> Z-scheme Photoanodes for Remarkable Photoelectrochemical Water Splitting", *Nanoscale* **2016**, 8, 15720-15729.

(14) Wei-Hao Lin, Yi-Hsuan Chiu, Pao-Wen Shao, Yung-Jung Hsu\*, "Metal-Particle-Decorated ZnO Nanocrystals: Photocatalysis and Charge Dynamics", *ACS Applied Materials & Interfaces* **2016**, 8, 32754-32763.

(15) Yi-Han Hsu, An T. Nguyen, Yi-Hsuan Chiu, Jing-Mei Li, Yung-Jung Hsu\*, "Au-decorated GaOOH Nanorods Enhanced the Performance of Direct Methanol Fuel Cells under Light Illumination", *Applied Catalysis B: Environmental* **2016**, 185, 133-140.

(16) Yu-Chih Chen, Tao-Cheng Liu, and Yung-Jung Hsu\*, "ZnSe-0.5(N<sub>2</sub>H<sub>4</sub>) Hybrid Nanostructures: A Promising Alternative Photocatalyst for Solar Conversion", *ACS Applied Materials & Interfaces* **2015**, 7, 1616-1623.

(17) Kai-An Tsai and Yung-Jung Hsu\*, "Graphene quantum dots mediated charge transfer of CdSe nanocrystals for enhancing photoelectrochemical hydrogen production", *Applied Catalysis B: Environmental* **2015**, 163, 343-351.

(18) Ying-Chih Pu, Wei-Hao Lin and Yung-Jung Hsu\*, "Modulation of Charge Carrier Dynamics of Na<sub>x</sub>H<sub>2</sub>-xTi<sub>3</sub>O<sub>7</sub>-Au-Cu<sub>2</sub>O Z-Scheme Nanoheterostructures through Size Effect", *Applied Catalysis B: Environmental* **2015**, 163, 343-351.

(19) Yi-Hsuan Lu, Wei-Hao Lin, Chao-Yao Yang, Yi-Hsuan Chiu, Ying-Chih Pu, Min-Han Lee, Yuan-Chieh Tseng, and Yung-Jung Hsu\*, "A facile green antisolvent approach to Cu<sup>2+</sup>-doped ZnO nanocrystals with visible-light-responsive photoactivities," *Nanoscale* **2014**, 6, 8796-8803.

(20) Ying-Chih Pu, Yichuan Ling, Kao-Der Chang, Chia-Ming Liu, Jin Z. Zhang, Yung-Jung Hsu\*, Yat Li\*, "Surface passivation of TiO<sub>2</sub> nanowires using a facile precursor-treatment approach for photoelectrochemical water oxidation," *Journal of Physical Chemistry C* **2014**, 118, 15086-15094.

(21) Yin-Kai Lin and Yung-Jung Hsu\*, "Metal-Cu<sub>2</sub>O core-shell nanocrystals for gas sensing applications: Effect of metal composition," *Sensors and Actuator B: Chemical* **2014**, 204, 190-196.

(22) Ying-Chih Pu and Yung-Jung Hsu\*, "Multicolored Cd<sub>1-x</sub>Zn<sub>x</sub>Se quantum dots with type-I core/shell structure: single-step synthesis and their use as light emitting diodes," *Nanoscale* **2014**, 6, 3881-3888.