

## 衛子健 教授 TZU-CHIEN WEI, PROFESSOR

- 國立清華大學 碩士，民國八十八年
- 國立清華大學 博士，民國九十六年
- M.S. National Tsing-Hua University, 1999
- Ph.D. National Tsing-Hua University, 2007



### 主要研究領域

- 染料敏化太陽電池實用化技術開發  
高效元件設計與製作，奈米鉑對電極優化，陽極摻雜及界面修飾，紫質染料共吸附優化，大面積模組製程設計與製作，低光亮度元件設計及其室內應用。
- 電化學在矽及PI基板金屬化之應用  
矽烷衍生物表面改質，金屬雙重層沉積技術與界面控制，奈米鈀觸媒合成與無電鍍技術於矽晶太陽能電池及軟性印刷電路板之應用。
- 鈣鈦礦太陽能電池研究及開發  
電沉積於製備電子及電洞傳輸層之技術開發，並搭配低溫製程之軟性電池製備研究。無毒溶劑系統及無鉛系統鈣鈦礦太陽能電池之製程開發及元件行為探討。
- 石墨烯於氣體感測元件開發及應用  
高產率石墨烯於水相溶液中剝離程序開發與性質鑑定，及其在氣體感測元件中的製程開發與應用。

### Main Research Interests

- **Practical Technology Developments on Dye Sensitized Solar Cell**  
Highly efficient DSSC device design and fabrication, including nano-platinum counter electrode optimization, doping and interface modification on photoanode, co-sensitization of porphyrin and organic dye, module device design & fabrication and device design for low-sun and indoor application.
- **Electrochemical Metallization for Silicon Solar Cell**  
Silicon surface modification by silane derivatives, double-layer metal deposition and interface control, synthesis of nano-Pd catalyst applied on electroless plating for silicon solar cell and flexible printed circuit board.
- **Research and development of perovskite solar cell**  
Versatile electrodeposition technique for preparing electron and hole transporting layer and developing low-temperature processed flexible devices. Studies on lead-free and non-toxic solvent system processed perovskite solar cells.
- **A room temperature operating chemiresistor gas sensor based on liquid-phase exfoliation graphene**  
Characterization of high quality water-dispersed exfoliated graphene and its application on chemiresistor gas sensor.

### 代表作 (Selected Publications)

- Tsung-Yu Hsieh, Mikhail Pylnev, Emilio Palomares, and **Tzu-Chien Wei**, "Exceptional Long Electron Lifetime of Methylammonium Lead Iodide Perovskite Solar Cell Made from Aqueous Lead-Nitrate Precursor", *Advanced Functional Materials*, (Accepted) (IF = 15.621, Rank = 5/148)
- Peng Zhai, Tzu-Sen Su, Tsung-Yu Hsieh, Wei-Yen Wang, Lixia Ren, Jiayi Guo, **Tzu-Chien Wei**, "Toward clean production of plastic perovskite solar cell: Composition-tailored perovskite absorber made from aqueous lead nitrate precursor", *Nano Energy*, 2019, 65, 104036. (IF = 15.548, Rank = 6/148).
- Tzu-Sen Su, **Tzu-Chien Wei**, "Co-Electrodeposition of Sn-Doped TiO<sub>2</sub> Electron-Transporting Layer for Perovskite Solar Cells", *Phys. Status Solidi A*, 2019. (Early View). (IF = 1.606, Rank = 91/148).
- Tzu-Sen Su, Han-Yan Tsai, Kala Kannankutty, Chien-Tien Chen, Yun Chi, **Tzu-Chien Wei**, "New Spiro Phenylpyrazole/dibenzosuberene Derivatives as Hole Transporting Material for Perovskite Solar Cells" *Solar RRL*, 2019, 3, 10, 1900143. (New journal)
- Kuan-Ting Wang, Wei-Yen Wang, **Tzu-Chien Wei**, "Photomask-Free, Direct Selective Electroless Deposition on Glass by Controlling Surface Hydrophilicity." *ACS Omega*, 2019, 4, 4, 7706-7710. (IF = 2.584, Rank = 76/172).

