



Prof. Ming-Chang Yang (楊明長教授)

Ph.D.: Chemical Engineering,  
Case Western Reserve University

Email: mcyang@mail.ncku.edu.tw

Phone: 886-6-2757575 ext 62666

### Research Interests

Electrochemical technique is our research theme and applied on two fields:

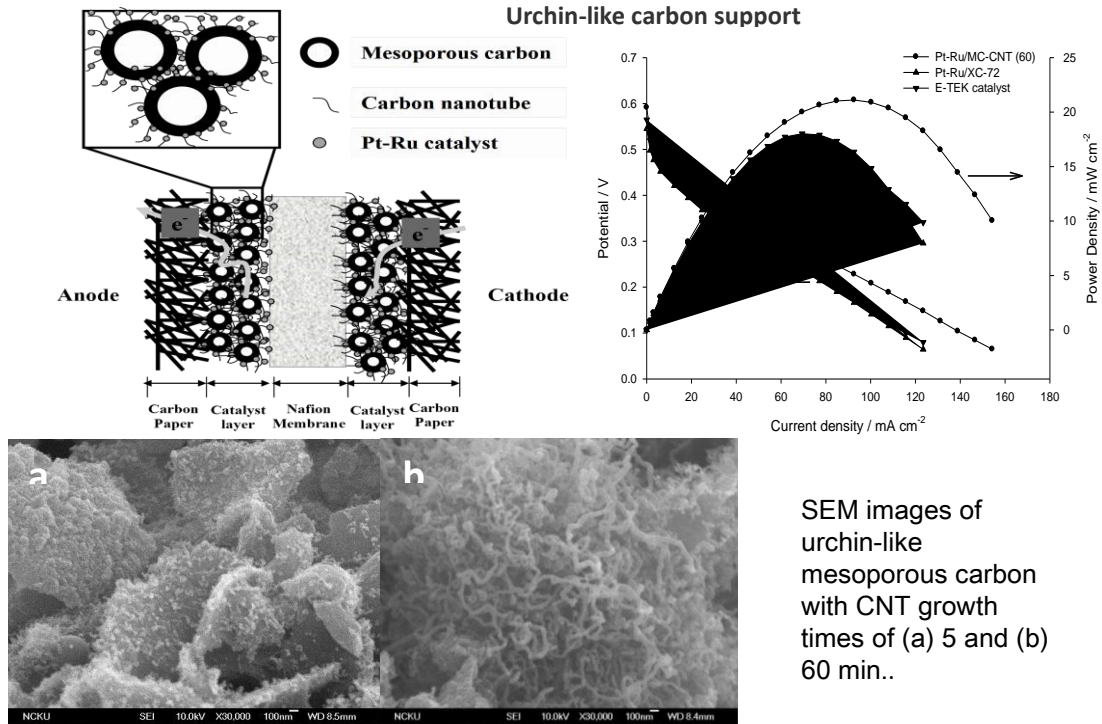
**Fuel cells** are an energy technology with high energy efficiency, low emission, low noise and high size flexibility. We focus our works on polymer electrolyte fuel cells with hydrogen (PEMFC) and methanol (DMFC) as the direct fuels. The synthesis of catalysts and the fabrication of membrane electrode assembly are our major research interests. Fluffy carbon support is used as a catalyst support in some of our fuel cells. We also pay attention on catalyst durability.

**Electrochemical sensors** for gases, such as carbon monoxide, hydrogen sulfide, oxygen and vinyl chloride, have been developed in our laboratory. Our recent interests are on biosensors, particularly for the simultaneous detection of dopamine, ascorbic acid, and uric acid.

### Representative Publications

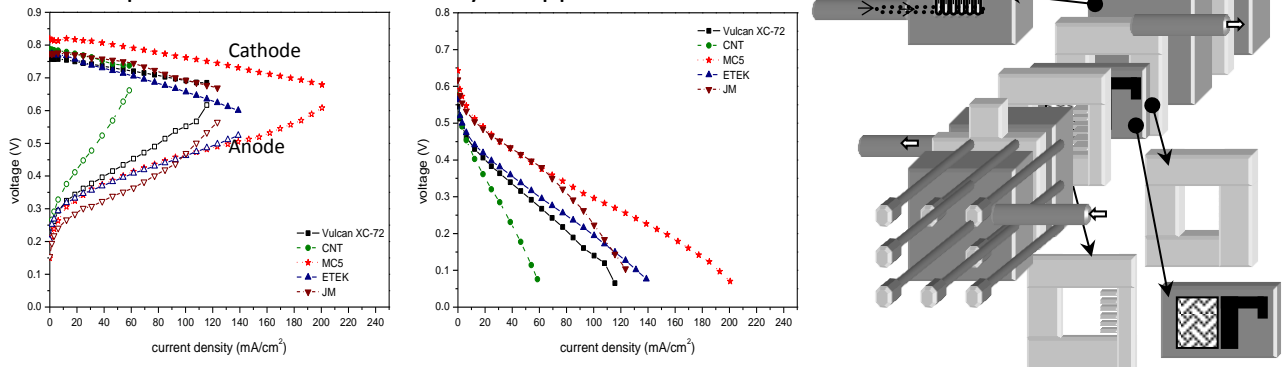
1. Min-Chieh Chuang, Chung-Chiun Liu\*, Ming-Chang Yang, "An Electrochemical Tyrosinase-immobilized Biosensor for Albumin—toward a Potential Total Protein Measurement", *Sensors and Actuators B*, 114(1), p. 357 (2006).
2. Ming-Chang Yang\* and Chih-Hung Hsueh, "Impedance Analysis of Working PEMFCs in the Presence of Carbon Monoxide", *J. Electrochem. Soc.*, 153(6), p. A1043 (2006).
3. Chun-Wei Hsu and Ming-Chang Yang\*, "The Enhancement of Imprinting Effect in Cholesterol Imprinted Microporous Silica", *J. of Non-Crystalline Solids*, 354(34), p. 4037 (2008).
4. Chun-Wei Hsu and Ming-Chang Yang\*, "Electrochemical Epinephrine Sensor Using Artificial Receptor Synthesized by Sol-gel Process", *Sensors and Actuators B: Chemical*, 134(2), p. 680 (2008).
5. Ching-Fa Chi, Ming-Chang Yang and Hung-Shan Weng\*, "A Proper Amount of Carbon Nanotubes for Improving the Performance of Pt-Ru/C Catalysts for Methanol Electrooxidation", *Journal of Power Sources*, 193(2), p. 462 (2009).
6. Juei Dong Lu, Ming-Chang Yang\*, "Dodecylamine-modified Carbon Supports for Cathode in Proton Exchange Membrane Fuel Cells", *Journal of Power Sources*, 196(18), p. 7450 (2011).
7. Juei Dong Lu, Ming-Chang Yang\*, "Cell Performance of Polymer Electrolyte Fuel Cell with Urchin-like Carbon Supports", *Journal of Power Sources*, 196(20), p. 8519 (2011).
8. Yi-Kai Chih and Ming-Chang Yang\*, "2,2'-Azino-bis(3-ethylbenzthiazoline-6-sulfonic Acid) Modified Electrode for Detection of Dopamine and Uric Acid in the Presence of Ascorbic Acid", *Bioelectrochemistry*, 91, p. 44 (2013).
9. Yi-Kai Chih and Ming-Chang Yang\*, "Simultaneous detection of dopamine and ascorbic acid using silver/silver sulfide modified carbon nanotube electrodes", *J Taiwan Inst. Chem. Eng.*, 44 (2013).

## ◆ Proton Exchange Membrane Fuel Cell



## ◆ Direct Methanol Fuel Cell

Mesoporous carbon as the catalyst support.



## ◆ Biochemical Sensors

Simultaneous detections of DA/UA and DA/AC with mediators

