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## Synthesis and characterization of nano-hybrid noble metals/oxides/MWCNTs electrocatalysts for fuel cells

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**T** o develop alternative renewable energy, the electro catalyst of Pd and AuPd on the oxide/MWCNTs substrate have been synthesized in this study. The purpose of this study was to enhance the electrocatalytic active and anti-CO poison of Pd catalyst. Thus, bimetallic system and oxide modified MWCNTs substrates have been explored. Au has been choosing as bimetallic adding element. Also, TiO<sub>2</sub> and WO<sub>3</sub> are two oxides used to modified MWCNTs substrates. TiO<sub>2</sub> and WO<sub>3</sub> are synthesized by impregnation and sol-gel method, respectively. Pd and AuPd are both synthesized by photosynthesis using SRRC X-ray Irradiation. Pd and AuPd series of oxide/MWCNTs samples are successfully synthesized in this study that are confirmed by XRD, FESEM and HRTEM. The electrocatalytic performances of Pd series of samples indicate Pd/N-TiO<sub>2</sub>/ MWCNTs has best performance in oxide modified samples, after 60 CV cycles its current is decay from 270 to 25 mA/mg. But comparing to Pd/MWCNTs sample, the oxide modified substrate samples have the worst performance. Pd/MWCNTs has much high performance and after 60 CV cycles the current is decay from about 670 to 160 mA/mg. For AuPd series of samples, AuPd/N -TiO<sub>2</sub>/MWCNTs and AuPd/WO<sub>3</sub>/MWCNTs samples have better performance. The results show the cyclic current of AuPd/N-TiO<sub>2</sub>/MWCNTs will decay from 165 mA/mg to 50 mA/mg after 60 CV cycles. The decay of cyclic current for AuPd/WO<sub>3</sub>/MWCNTs is from about 140 mA/mg to 100 mA/mg. It indicates N-TiO<sub>2</sub> and WO<sub>3</sub> modified substrate can enhance the stability of electrocatalytic active in AuPd series.

## **Biography**

Hong-Ming Lin has completed his PhD in Materials Science from University of Wisconsion – Madison. He had been the Chairman of Materials Engineering Department and Dean of Research and Development of Tatung University. He has published more than 150 papers in reputed journals and obtained more than 10 patents.

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