## 國立交通大學

## 材料科學與工程研究所

## 博士論文

ECR-CVD 法合成包覆各種金屬之碳基奈米結構材料 製程、成長機制與性質

Processes, growth mechanisms and properties of various metal-encapsulated carbon nanostructured materials by ECR-CVD

研 究 生:林兆焄

指導教授:郭正次 教授

中華民國九十五年七月

## ECR-CVD 法合成包覆各種金屬之碳基奈米結構材料 製程、成長機制與性質

Processes, growth mechanisms and properties of various metal-encapsulated carbon nanostructured materials by ECR-CVD

研究生:林兆煮 Student: Chao-Hsun Lin

指導教授:郭正次 Advisor: Dr. Cheng-Tzo Kuo



Submitted to Department of Material Science and Engineering

College of Engineering

National Chiao Tung University

in partial Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy

in

Material Science and Engineering

July 2006

Hsinchu, Taiwan, Republic of China