



## G111 電分析化學實驗室 Analytical Electrochemistry Laboratory

### ● 本實驗室的研究內容

1. 過氧化氫感測器
2. 電化學生醫感測器
3. 反應工程
4. 動態模擬

### ● 本實驗室的成員

1. 指導老師：林浩 老師

2. 碩士班學生

年級	姓名	論文題目
碩一	丁家治	以普魯士藍修飾碳糊電極應用於偵測過氧化氫的應答電流之研究

### 3. 大學部專題生

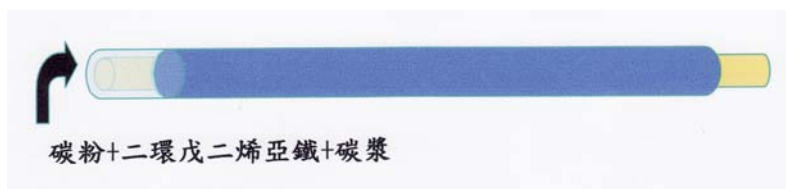
年級	姓名	論文題目
大四	曾捷文 許維軒	碳糊細小電極之反應參數對偵測過氧化氫的靈敏度之影響
大四	楊孟儒 歐政巖 陳慧修	碳糊細小電極應用於偵測過氧化氫的平均應答電流之研究

### ● 本實驗室的畢業學長

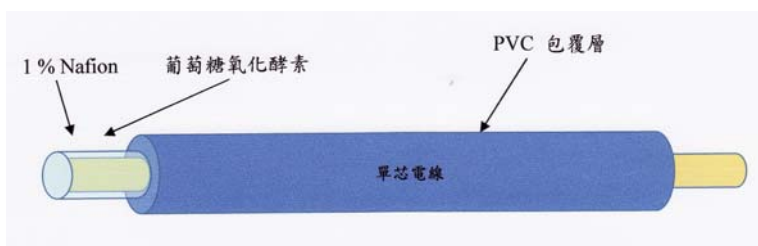
畢業年份	姓名	論文題目
2003	仇善誠	生化反應槽之穩定狀態和動態分析
2004	蘇文柯	微生物反應槽之穩定狀態和動態分析
2005	林憲志	兩個生化反應槽串聯之穩定狀態和動態分析
2006	廖國翔	以含釘黃血鹽修飾碳糊電極應用於電流式過氧化氫感測器及葡萄糖生醫感測器之研究
2006	王祥雲	兩個微生物反應槽串聯之穩定狀態和動態分析
2006	汪乙生	以二環戊二烯亞鐵修飾碳糊電極應用於電流式葡萄糖感測器與平版式生醫感測器之製作及改進

2007	蕭佳政	以因子實驗設計分析以含銅赤血鹽修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響及其應用於葡萄糖生醫感測器之研究
2007	郭寶財	以因子實驗設計分析以二環戊二烯亞鐵修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響及其應用於葡萄糖生醫感測器之研究
2008	羅濟玟	以 Meldola' s Blue 修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響
2010	胡真熏	以含鉻黃血鹽修飾碳糊電極之反應參數對偵測過氧化氫的靈敏度之影響
2011	林庭立	以含鈷赤血鹽修飾碳糊電極應用於過氧化氫感測器之研究
2012	連崇閔	以含鎳赤血鹽修飾碳糊電極應用於偵測過氧化氫之研究

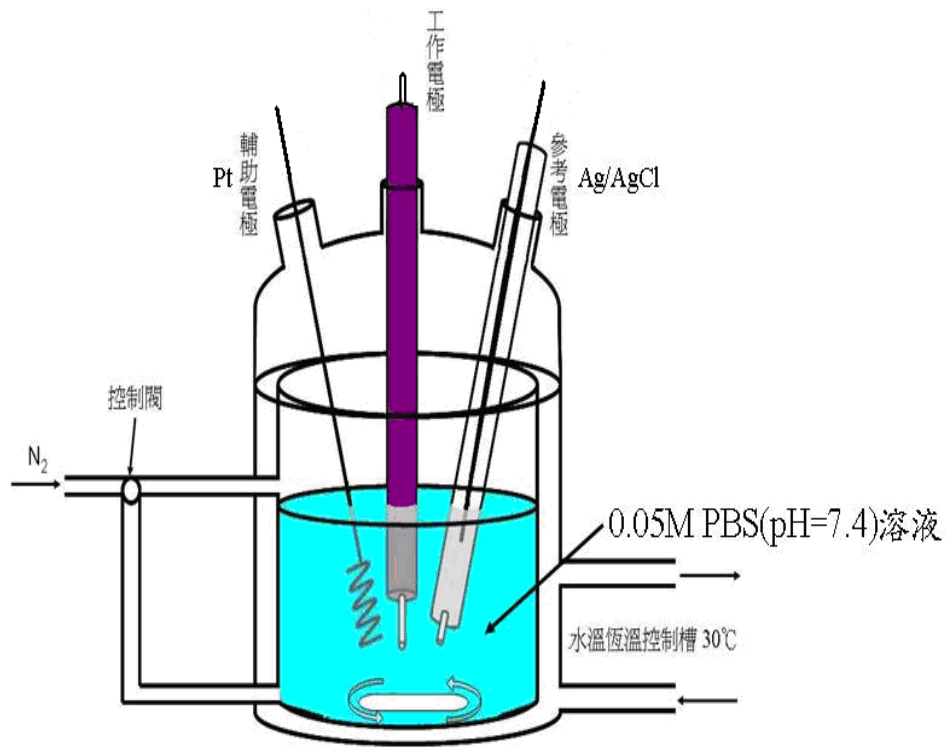
## ● 實驗室儀器設備介紹



碳糊電極示意圖



酵素電極示意圖



三電極系統示意圖



電化學分析儀

# ● 本實驗室的研究成果

## (A)期刊論文：

1. 林浩，2000年11月，“生化培養槽之動態和穩定狀態”，南台科技大學學報，第二十四期，pp.155-162。
2. 林浩，2001年3月，“連續培養之回流生化反應系統之穩定狀態和動態分析”，南台科技大學學報，第二十五期，pp.15-24。

## (B)研討會論文：

1. 汪乙生、廖國翔、李錦厚、林浩、張良謙，2005年5月，”以二茂鐵修飾碳糊電極應用於電流式過氧化氫感測器之研究”，第十一屆化學感測科技研討會，pp.54-58。
2. 蔡君賢、許文嘉、張良謙、李錦厚、林浩，2005年5月，”應用含鉻黃血鹽修飾碳糊電極製作電流式生醫感測器”，第十一屆化學感測科技研討會，pp.59-63。
3. 許文嘉、蔡君賢、張良謙、林浩、李錦厚，2005年5月，”含銅赤血鹽及白金奈米粉粒修飾碳糊電極應用於電流式生醫感測器之製作”，第十一屆化學感測科技研討會，pp.64-68。
4. 林憲志、王祥雲、林浩，2005年6月，”被捕食者-捕食者相互作用在兩個生化反應槽串聯之穩定度和動態分析”，第十屆生化工學研討會，pp.15。
5. 王祥雲、林憲志、林浩，2005年6月，”兩個微生物反應槽串聯之動態和穩定度分析”，第十屆生化工學研討會，pp.15。
6. 汪乙生、廖國翔、蕭佳政、李錦厚、張良謙、林浩，2005年11月，”以二茂鐵修飾碳糊電極應用於電流式葡萄糖生醫感測器之研究”，中國化學工程學會2005年年會，pp.PB-4。
7. 蔡君賢、汪乙生、廖國翔、李錦厚、張良謙、林浩，2005年11月，”應用含鉻黃血鹽修飾碳糊電極製造電流式生醫感測器”，中國化學工程學會2005年年會，pp.PB-17。
8. 王祥雲、林浩，2005年11月，”被捕食者-捕食者相互作用在兩個微生物反應槽串聯之穩定狀態和動態分析”，中國化學工程學會2005年年會，pp.PB-18。
9. 許文嘉、汪乙生、廖國翔、李錦厚、張良謙、林浩，2005年11月，”含銅赤血鹽及白金奈米粉粒修飾碳糊電極應用於電流式生醫感測器之製作”，中國化學工程學會2005年年會，pp.PB-27。
10. 廖國翔、汪乙生、蕭佳政、李錦厚、張良謙、林浩，2005年11月，”以含鈦黃血鹽修飾碳糊電極應用於電流式過氧化氫感測器之研究”，中國化學工程學會2005年年會，pp.PB-32。
11. 蔡君賢、汪乙生、廖國翔、李錦厚、張良謙、林浩，2005年11月，”含鉻黃血鹽修飾平版式酵素電極之製備及其應用於電流式生醫感測器”，中國化學會94年年會，pp. BC0388。
12. 廖國翔、郭寶財、蕭佳政、李錦厚、張良謙、林浩，2005年11月，”以含鈦黃血鹽修飾碳糊電極應用於電流式葡萄糖感測器之研究”，中國化學會94年年會，pp. BC0389。
13. 許文嘉、汪乙生、廖國翔、李錦厚、張良謙、林浩，2005年11月，”含銅赤血鹽及白金奈米粉粒修飾平版式酵素電極應用於電流式生醫感測器之製作”，中國化學會94年年會，pp.BC0390。
14. 汪乙生、郭寶財、蕭佳政、李錦厚、張良謙、林浩，2005年11月，”以二環戊二烯亞鐵修飾印刷電極應用於電流式葡萄糖生醫感測器之研究”，中國化學會94年年會，pp.BC0391。

15. 王祥雲、林浩，2006年6月，”被捕食者-捕食者相互作用在兩個微生物反應槽串聯之穩定度和動態分析”，第十一屆生化工程研討會 & 生醫奈米暨組織工程國際研討會，pp.P3-012。
16. 郭寶財、蕭佳政、廖國翔、李錦厚、張良謙、林浩，2006年6月，”以二環戊二烯亞鐵修飾碳糊電極之反應參數對電流式過氧化氫感測器之應答電流之影響及其應用於葡萄糖生醫感測器之研究”，第十一屆生化工程研討會 & 生醫奈米暨組織工程國際研討會，pp.P1-028。
17. 汪乙生、郭寶財、蕭佳政、李錦厚、張良謙、林浩，2006年6月，”以二環戊二烯亞鐵修飾碳糊電極應用於電流式葡萄糖生醫感測器之研究”，第十一屆生化工程研討會 & 生醫奈米暨組織工程國際研討會，pp.P1-029。
18. 廖國翔、蕭佳政、郭寶財、李錦厚、張良謙、林浩，2006年6月，”以含鈦黃血鹽修飾碳糊電極應用於電流式葡萄糖生醫感測器之研究”，第十一屆生化工程研討會 & 生醫奈米暨組織工程國際研討會，pp.P1-030。
19. 蕭佳政、郭寶財、廖國翔、李錦厚、張良謙、林浩，2006年6月，”以含銅赤血鹽修飾碳糊電極之反應參數對電流式過氧化氫感測器之應答電流之影響及其應用於葡萄糖生醫感測器之研究”，第十一屆生化工程研討會 & 生醫奈米暨組織工程國際研討會，pp.P1-031。
20. 林浩、郭寶財、羅濟玟、陳柏哲、李錦厚、張良謙，2006年11月，”以二環戊二烯亞鐵修飾碳糊電極之反應參數對電流式過氧化氫感測器之應答電流的靈敏度之影響及其應用於葡萄糖生醫感測器之研究”，台灣化學工程學會2006年年會，pp.5- P02。
21. 林浩、汪乙生、郭寶財、蕭佳政、李錦厚、張良謙，2006年11月，”以二環戊二烯亞鐵修飾平版式電極應用於電流式葡萄糖生醫感測器之研究”，台灣化學工程學會2006年年會，pp.5- P03。
22. 林浩、蕭佳政、陳柏哲、羅濟玟、李錦厚、張良謙，2006年11月，”以含銅赤血鹽修飾碳糊電極之反應參數對電流式過氧化氫感測器之應答電流的靈敏度之影響及其應用於葡萄糖生醫感測器之研究”，台灣化學工程學會2006年年會，pp.5- P04。
23. 林浩、廖國翔、蕭佳政、郭寶財、李錦厚、張良謙，2006年11月，”以含鈦黃血鹽修飾平版式酵素電極應用於電流式生醫感測器之研究”，台灣化學工程學會2006年年會，pp.5- P05。
24. 林浩、蕭佳政、郭寶財、羅濟玟、李錦厚、張良謙，2007年6月，”以因子實驗設計分析以含銅赤血鹽修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響及其應用於葡萄糖生醫感測器之研究”，第十二屆生化工程研討會，pp.P-III-6。
25. 林浩、郭寶財、蕭佳政、羅濟玟、李錦厚、張良謙，2007年6月，”以因子實驗設計分析以二環戊二烯亞鐵修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響及其應用於葡萄糖生醫感測器之研究”，第十二屆生化工程研討會，pp.P-III-7。
26. 林浩、羅濟玟、蕭佳政、郭寶財、李錦厚、張良謙，2007年6月，”以 Meldola's Blue 修飾碳糊電極之反應參數對偵測過氧化氫的應答電流之影響及其應用於葡萄糖生醫感測器之研究”，第十二屆生化工程研討會，pp.P-III-8。
27. 林浩、汪乙生、羅濟玟、呂伍洲、李錦厚、張良謙，2007年11月，”以二環戊二烯亞鐵修飾碳糊電極對偵測葡萄糖感測器之靈敏度之研究”，台灣化學工程學會2007年年會，pp.E-005。
28. 林浩、廖國翔、羅濟玟、廖梅君、李錦厚、張良謙，2007年11月，”以含鈦黃血鹽修飾碳糊電極對偵測葡萄糖生醫感測器之靈敏度之研究”，台灣化學工程學會2007年年會，pp.E-006。
29. 林浩、蕭佳政、羅濟玟、王恩澤、李錦厚、張良謙，2007年11月，”以實驗設計分析含銅赤血鹽修飾碳糊電極對偵測過氧化氫之影響”，台灣化學工程學會2007年年會，pp.E-007。
30. 林浩、郭寶財、羅濟玟、林辰芳、李錦厚、張良謙，2007年11月，”以實驗設計分析二環戊二烯亞鐵修飾碳糊電極對偵測過氧化氫之影響”，台灣化學工程學會2007年年會，pp.E-008。

31. 林浩、羅濟玟、李錦厚、張良謙，2007年11月，”以 Meldola's Blue 修飾碳糊電極之組成比例對偵測過氧化氫之影響”，台灣化學工程學會 2007 年年會，pp.E-009。
32. Hau Lin, Yi-Sheng Wang, Chi-Wen Lo, Wu-Chou Lu, Chin-Hou Li, and Liang-Chien Chang, December, 2007 “A Study of the Carbon Paste Electrode Modified with Ferrocene and Its Application to the Detection of the Sensitivity of the Amperometric Hydrogen Peroxide Sensor”, Annual Chinese Chemical Society & ICCT 2007 Joint Conference, pp.ANA0001.
33. Hau Lin, Kuo-Hsiang Liao, Chi-Wen Lo, Mei-Chun Liao, Chin-Hou Li, and Liang-Chien Chang, December, 2007 “A Study of the Carbon Paste Electrode Modified with Ruthenium Hexacyanoferrate and Its Application to the Detection of the Sensitivity of the Hydrogen Peroxide Sensor”, Annual Chinese Chemical Society & ICCT 2007 Joint Conference, pp.ANA0002.
34. Hau Lin, Chia-Cheng Hsiao, Chi-Wen Lo, En-Tse Wang, Chin-Hou Li, and Liang-Chien Chang, December, 2007 “The Effect of the Operating Potential on the Responding Current of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with the Copper Hexacyanoferrate”, Annual Chinese Chemical Society & ICCT 2007 Joint Conference, pp.ANA0003.
35. Hau Lin, Pao-Tsai Kuo, Chi-Wen Lo, Chen-Fang Lin, Chin-Hou Li, and Liang-Chien Chang, December, 2007 “The Effect of the pH of Buffer Solution on the Responding Current of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with the Ferrocene”, Annual Chinese Chemical Society & ICCT 2007 Joint Conference, pp.ANA0004.
36. Hau Lin, Chi-Wen Lo, Chin-Hou Li, and Liang-Chien Chang, December, 2007 “The Effect of the Reaction Parameters on the Sensitivity of the Responding Current of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with the Meldola's Blue”, Annual Chinese Chemical Society & ICCT 2007 Joint Conference, pp.ANA0005.
37. Hau Lin, Yi-Sheng Wang, Chi-Wen Lo, Wu-Chou Lu, Chin-Hou Li, and Liang-Chien Chang, June, 2008, “A Study of Screen Printed Planar Electrode Modified with Ferrocene and Its Application to Detection of Sensitivity of the Hydrogen Peroxide Sensor”, The 13 th Biochemical Engineering Conference, pp.PIV-18.
38. Hau Lin, Kuo-Hsiang Liao, Chi-Wen Lo, Mei-Chun Liao, Chin-Hou Li, and Liang-Chien Chang, June, 2008, “Preparation of Screen Printed Planar Electrode Modified with Ruthenium Hexacyanoferrate and Its Application to Detection of Sensitivity of the Hydrogen Peroxide Sensor”, The 13 th Biochemical Engineering Conference, pp.PIV-19.
39. Hau Lin, Chia-Cheng Hsiao, Chi-Wen Lo, En-Tse Wang, Chin-Hou Li, and Liang-Chien Chang, June, 2008, “The Effect of the pH of Buffer Solution on the Sensitivity of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Copper Hexacyanoferrate”, The 13 th Biochemical Engineering Conference, pp.PIV-20.
40. Hau Lin, Pao-Tsai Kuo, Chi-Wen Lo, Chen-Fang Lin, Chin-Hou Li, and Liang-Chien Chang, June, 2008, “The Effect of the Stirring Rate on the Sensitivity of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Ferrocene”, The 13th Biochemical Engineering Conference, pp.PIV-21.
41. Hau Lin, Chi-Wen Lo, Chang-Yi Li, Chin-Hou Li, and Liang-Chien Chang, June, 2008, “The Effect of the Operating Potential on the Sensitivity of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Meldola's Blue”, The 13 th Biochemical Engineering Conference, pp.PIV-22.
42. Hau Lin, Yi-Sheng Wang, Chen-Hsun Hu, Hsu-Jen Lu, Chin-Hou Li, and Liang-Chien Chang, November, 2008, “Preparation of Screen Printed Planar Electrode Modified with Ferrocene and Its Application to Glucose Biosensor”, 2008 Taiwan/Korea/Japan ChE Conference and 55<sup>th</sup> TwICHe Annual Conference, pp.PS4001.

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44. Hau Lin, Chia-Cheng Hsiao, Chen-Hsun Hu, Chun-Hsien Huang, Chin-Hou Li, and Liang-Chien Chang, November, 2008, "A Study of the Operating Conditions for the Responding Current of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Copper Hexacyanoferrate", 2008 Taiwan/Korea/Japan ChE Conference and 55<sup>th</sup> TwICHE Annual Conference, pp.PS4003.
45. Hau Lin, Pao-Tsai Kuo, Chen-Hsun Hu, Chun-Ting Hsu, Chin-Hou Li, and Liang-Chien Chang, November, 2008, "A Study of the Operating Conditions for the Sensitivity of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Ferrocene", 2008 Taiwan/Korea/Japan ChE Conference and 55<sup>th</sup> TwICHE Annual Conference, pp.PS4004.
46. Hau Lin, Chi-Wen Lo, Chen-Hsun Hu, Yu-An Li, Chin-Hou Li, and Liang-Chien Chang, November, 2008, "A Factorial Design for Analysis of the Effect of Reaction Parameters on the Sensitivity of Detection of Hydrogen Peroxide for the Carbon Paste Electrode Modified with Meldola's Blue", 2008 Taiwan/Korea/Japan ChE Conference and 55<sup>th</sup> TwICHE Annual Conference, pp.PS4005.
47. Hau Lin, Yi-Sheng Wang, Chen-Hsun Hu, Hsu-Jen Lu, Chin-Hou Li, and Liang-Chien Chang, December, 2008, "Preparation of Carbon Paste Electrode Modified with Platinum Particles and Ferrocene and Its Application to Glucose Biosensor", Chemical Society Located in Taipei Annual Meeting 2008, pp.AC006.
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