

# 歡迎光臨螯合高分子實驗室(I501)

## Welcome to Laboratory of Chelating Polymers

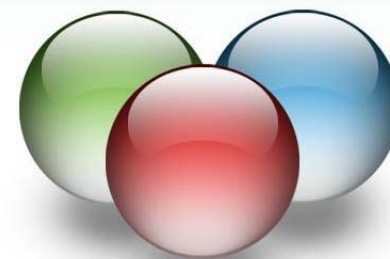
◆本實驗室的研究領域 --- 螯合高分子(Chelating polymer)的合成與應用

(1)製備螯合高分子並應用於回收與分離水中的重金屬離子：

- 期望降低水中的重金屬離子之污染。
- 藉由分離與純化技術，提高回收的重金屬離子之價值。

(2)應用螯合高分子製備奈米無機粒/高分子複合材料：

- 研究製備奈米粒的相關技術。
- 探討相關複合材料的應用，例如光觸媒特性、殺菌性質---等。



## 本實驗室的成員



1.指導老師：陳志彥老師

2.碩士班學生：

年級	姓名	論文題目	備註
碩二	朱韋儒	奈米硫化銅/高分子複合材料的製備與可見光下降解染料之研究 Preparation of CuS nanoparticles/polymer composites for dyes photodegradation under visible light irradiation	
碩二	鄭詠心	以負載於螯合高分子表面的奈米氯化銀降解有機染料之研究 Photodegradation of organic dyes by silver chloride nanoparticles supported on a chelating polymer	
碩二	張詠承	應用己二胺官能化的螯合樹脂去除水中重金屬離子之研究 Application of Diaminohexane functionalized chelating resin for removing heavy metal ions from aqueous solutions	
碩一	林亭灼		
碩一	翁偉翔		

### 3.大學部專題生：

學年度	姓名	備註
107	楊明勳、吳孟寰、王琮欽	
	許博凱、黃冠銘、沈穎宏	
	洪上峰、周建佑、鄭名順、阮泰維	
108	郭妍孜、陳全凱、莊育璋、洪愷廷	
	王士倫、葉家昌、顧崇道	
	鄭意螢、蔡佳芳、劉依庭	

## 碩士班的畢業學長、姐



～本實驗室的指導老師自 2005 年 8 月開始收研究生，目前的畢業碩士生如下：

畢業年份	姓名	論文題目	備註
2017	石紫瑤	側鏈含二胺基-N-甲基二丙基胺之螯合樹脂吸附重金屬離子之研究 Adsorption of Heavy Metal Ions from Aqueous Solutions By a Novel Chelating Resin Carrying 3,3'-Diamino-N-Ethyldipropylamine	
	姚亭伶	應用丙醇胺官能化的螯合樹脂去除水中重金屬離子之研究 Application of 3-Amino-1-propanol functionalized chelating resin for removing heavy metal ions from aqueous solutions	
2016	林安	具 1,2-丙二胺之螯合樹脂回收水中重金屬離子之研究 Application of 1,2-diaminopropane functionalized chelating resin for the recovery of metal ions from aqueous solutions	
	周佩蓁	側鏈具 1,3-丙二胺之螯合樹脂吸附與分離水中重金屬離子之研究 Adsorption and Separation of Heavy Metal Ions from Aqueous Solutions by a Chelating Resin Containing 1,3-Diaminopropane	
2015	劉姿蕚	側鏈具 N-(2-羥乙基)乙二胺之螯合樹脂吸附與分離水中重金屬離子之研究 Adsorption and separation of heavy metal ions from aqueous solutions by a chelating resin containing N-(2-Hydroxyethyl)ethylenediamine groups	
	鄭丞良	側鏈含硫代蘋果酸鈉之螯合樹脂吸附與分離水中重金屬離子之研究 Adsorption and separation of heavy metal ions by a chelating resin containing sodium thiomalate groups	
2014	陳睿麒	側鏈含 2-(2-胺基乙氧基)乙醇之螯合樹脂吸附與分離水中重金屬離子之研究 Adsorption and Separation of heavy metal ions from aqueous solutions by a chelating resin containing 2-(2-Aminoethoxy)ethanol as chelating groups	

	孫嘉宏	奈米銀、硫化銀、氯化銀/高分子複合材料的合成與應用 Synthesis and application of silver, silver sulfide and silver chloride nanoparticles/polymer composites	
	吳皇慶	側鏈含三乙基四胺之螯合樹脂吸附水中重金屬離子與染料的研究 Adsorption of heavy metal ions and dyes by a chelating resin containing triethylenetetramine	
2012	郭恬綺	側鏈含二乙醇胺之螯合樹脂吸附與分離重金屬離子之研究 Adsorption of heavy metal ions by a chelating resin containing diethanolamine as chelating groups	
	陳致元	側鏈具多胺基之螯合樹脂的製備並應用於重金屬離子的回收 Adsorption of heavy metal ions by a chelating resin containing multi-amine groups	
2011	柯文杰	側鏈含麩胺酸之螯合樹脂吸附與分離重金屬離子之研究 Adsorption and separation of heavy metal ions by a chelating resin containing glutamic acid as chelating groups	
	陳佳鈴	製備側鏈韓麩胺酸的水膠及其吸水特性 Synthesis and swelling behaviors of a hydrogel containing glutamic acid	
2010	陳威廷	製備含二乙基三胺之螯合高分子與其應用 Preparation and application of a chelating resin containing diethylenetriamine	
2009	徐崑榮	以側鏈含絲胺酸之螯合樹脂吸附重金屬離子之研究 Adsorption of heavy metal ions by a chelating resin containing serine as chelating groups	
	廖育嬋	以側鏈含乙醇胺之螯合樹脂吸附重金屬離子之研究 Adsorption of heavy metal ions by a chelating resin containing ethanolamine as chelating groups	
2008	趙珮云	以側鏈含半胱胺酸之螯合樹脂吸附重金屬離子之研究 Adsorption of heavy metal ions by a chelating resin containing cysteine groups	
2007	陳智柔	奈米硫化鋅/高分子複合膜之製備及特性分析 Synthesis and characterization of zinc sulfide nanoparticles on a polymer film	

## 本實驗室的研究成果

### (A)期刊論文

- [1] Chuh-Yean Chen\*, Chen-Li Chiang, "Preparation of cotton fibers with antibacterial silver nanoparticles", *Materials Letters*, 62, 3607-3609 (2008). (SCI) 2008 年 8 月。
- [2] Chuh-Yean Chen\*, Mao-Syong Lin, Kun-Rong Hsu, "Recovery of Cu(II) and Cd(II) by a chelating resin containing aspartate groups", *Journal of Hazardous Materials*, 152(3), 986-993 (2008). (SCI) 2008 年 4 月。
- [3] Chen-Li Chiang\*, Chuh-Yean Chen, Ling-Wei Chang, "Purification of Recombinant Enhanced Green Fluorescent Protein Expressed in Escherichia coli with New Immobilized Metal Ion Affinity Magnetic Absorbents", *Journal of Chromatography B*, 864, 116-122 (2008). (SCI) 2008 年 3 月。
- [4] Chuh-Yean Chen\*, Chen-Li Chiang, Chuh-Rou Chen, "Removal of heavy metal ions by a chelating resin containing glycine as chelating groups", *Separation and Purification Technology*, 54, 396-403 (2007). (SCI) 2007 年 5 月。
- [5] Chen-Li Chiang\*, Ching-Shan Sung, Chuh-Yean Chen, "Application of Silica-Magnetite Nanocomposites to the Isolation of Ultrapure Plasmid DNA from Bacterial Cells", *Journal of Magnetism and Magnetic Materials*, 305, 483-490 (2006). (SCI) 2006 年 10 月。
- [6] Chuh-Yean Chen\*, Chen-Li Chiang, Po-Chen Huang, "Adsorptions of Heavy Metal Ions by a Magnetic Chelating Resin Containing Hydroxy and Iminodiacetate Groups", *Separation and Purification Technology*, 50, 15-21 (2006). (SCI) 2006 年 7 月。
- [7] Chen-Li Chiang\*, Ching-Shan Sung, Ting-Feng Wu, Chuh-Yean Chen, Chiung-Yuen Hsu, "Application of Superparamagnetic Nanoparticles in Purification of Plasmid DNA from Bacterial Cells", *Journal of Chromatography B*, 822, 54-60 (2005). (SCI) 2005 年 8 月
- [8] Chuh-Yean Chen\*, Chuh-Yung Chen, "Formation of Silver Nanoparticles on a Chelating Copolymer Film Containing Iminodiacetic Acid", *Thin Solid Films*, 484, 68-72 (2005). (SCI) 2005 年 7 月

- [9] Chuh-Yean Chen\*, Suz-Yen Chen, "Adsorption Properties of a Chelating Resin Containing Hydroxy Group and Iminodiacetic Acid for Copper Ions", *Journal of Applied Polymer Science*, 94, 2123-2130 (2004). (SCI) 2004 年 12 月
- [10] Chuh-Yean Chen, Chuh-Yung Chen\*, "Stability Constants of Water-soluble and Latex types of Chelating Polymers Containing Iminodiacetic Acid with some Transition-metal Ions", *European Polymer Journal*, 39, 991-1000 (2003). (SCI) 2003 年 5 月
- [11] Chuh-Yean Chen and Chuh-Yung Chen\*, "Stability Constants of Polymer-bound Iminodiacetate-type Chelating Agents with some Transition-metal Ions", *Journal of Applied Polymer Science*, 86, 1986-1994 (2002). (SCI) 2002 年 11 月
- [12] Cheng-Chien Wang, Mu-Han Cheng, Chuh-Yean Chen, Chuh-Yung Chen\*, "Facilitated Transport of Molecular Oxygen in the Cobalt-Chelated Copolymer Membranes Prepared by Soap-free Emulsion Polymerization", *Journal of Membrane Science*, 208, 133-145 (2002). (SCI) 2002 年 10 月
- [13] Cheng-Ho Chen\*, Chuh-Yean Chen, Yu-Wen Lo, Ching-Feng Mao, Wei-Yung Liao, "Studies of Glycolysis of Poly (ethylene terephthalate ) Recycled from Post-Consumer Soft- Drink Bottles. I :Influences of Glycolysis Conditions", *Journal of Applied Polymer Science*, 80, 943-948 (2001). (SCI) 2001 年 7 月
- [14] Cheng-Ho Chen\*, Chuh-Yean Chen, Yu-Wen Lo, Ching-Feng Mao, Wei-Yung Liao, "Studies of Glycolysis of Poly (ethylene terephthalate ) Recycled from Post-Consumer Soft- Drink Bottles. II :Factorial Experimental Design", *Journal of Applied Polymer Science*, 80, 956-962 (2001). (SCI) 2001 年 7 月

#### **(B)研討會論文(僅列出最近 5 年的資料)**

- [1] 江禎立、吳明立、陳志彥\*、張詠承, "含 2-(2-胺基乙氧基)乙醇之螯合樹脂吸附水中  $\text{Ni}^{2+}$  之研究", 2018 年功能性材料研討會暨科技部專題研究計畫成果發表會, page 219, 台南市。 2018 年 6 月
- [2] 吳明立、江禎立、陳志彥\*、鄭詠心, "側鏈具雙羧酸基之 pH-敏感型水膠的製備與吸水特性分析", 2018 年功能性材料研討會暨科技部專題研究計畫成果發表會, page 218, 台南市。 2018 年 6 月
- [3] 陳志彥、江禎立\*、陳豐祥、王聖璋、林冠宇、陳仕鑫, "MnFe<sub>2</sub>O<sub>4</sub>/SiO<sub>2</sub>/Ag 磁性奈米複合材料製備及其在殺菌之應用", 2018 年功能性材料研討會暨科技部專題研究計畫成果發表會, page 56, 台南市。 2018 年 6 月

- [4] Long-Biao Lai, Chen-Li Chiang, Ming-Li Wu, Chuh-Yean Chen\*, and Yong-Cheng Chang, "Removal of Copper Ions from Aqueous Solution by a Novel Chelating Resin Containing Imidazole as Chelating Groups", 2017 International Symposium on Novel and Sustainable Technology, page D-30, Tainan, Taiwan. October, 2017.
- [5] Chen-Li Chiang, Ming-Li Wu, Long-Biao Lai, Chuh-Yean Chen\*, and Wei-Ru Chu, "Triethylenetetramine-modified Cross-linked Poly(glycidyl methacrylate) Chelating Resin for the Adsorption of Dichromate Ions from Aqueous Solution", 2017 International Symposium on Novel and Sustainable Technology, page D-31, Tainan, Taiwan. October, 2017.
- [6] Ming-Li Wu, Long-Biao Lai, Chen-Li Chiang, Chuh-Yean Chen\*, and Yong-Sin Cheng, "Synthesis of Silver Sulfide Nanoparticles for Photocatalytic Application", 2017 International Symposium on Novel and Sustainable Technology, page D-32, Tainan, Taiwan. October, 2017.
- [7] Long-Biao Lai, Chen-Li Chiang, Ming-Li Wu, Chuh-Yean Chen\* and Tzu-Yao Shih, "Adsorption of Copper Ion from Aqueous Solution by A Novel Chelating Resin Carrying 3,3'-Diamino-N-Methyldipropylamine", 2016 International Symposium on Novel and Sustainable Technology, page D-75, Tainan, Taiwan. October, 2016.
- [8] Ming-Li Wu, Long-Biao Lai, Chen-Li Chiang, Chuh-Yean Chen\* and Ting-Ling Yao, "Application of 3-Amino-1-Propanol Functionalized Chelating Resin for Removing Heavy Metal Ions from Aqueous Solution", 2016 International Symposium on Novel and Sustainable Technology, page D-7, Tainan, Taiwan. October, 2016.
- [9] Ming-Li Wu, Chen-Li Chiang, Long-Biao Lai, Chuh-Yean Chen\*, Ting-Ling Yao and Tzu-Yao Shih, "Preparation of A Silver Nanoparticles/Polymer Composite for Improving The Rate of Dye Decomposition" , 2016 International Symposium on Novel and Sustainable Technology, page D-77, Tainan, Taiwan. October, 2016.
- [10] Chen-Li Chiang、An Lin、Chuh-Yean Chen\*，"Adsorption of  $\text{Cu}^{2+}$  from aqueous solution by a chelating resin carrying 1,2-diaminopropane groups"，台灣化學工程學會 62 週年年會暨科技部化工學門成果發表會-2015 台韓日三國化工會議，PD-018，高雄市。 2015 年 11 月。



- [11] Chen-Li Chiang、Pei-Chen Chou、Chuh-Yean Chen\*，"Application of 1,3-diaminopropane functionalized chelating resin for removing Cu<sup>2+</sup> from aqueous solution"，台灣化學工程學會 62 週年年會暨科技部化工學門成果發表會-2015 台韓日三國化工會議，PD-019，高雄市。 2015 年 11 月。
- [12] Chen-Li Chiang, Ming-Li Wu, Chuh-Yean Chen\*, and Chuan-Chun Chang, "SYNTHESIS OF SILVER NANOPARTICLES ON POLYMER SURFACE FOR DYE DECOMPOSITION", 2015 International Symposium on Novel and Sustainable Technology, PC-016 (page 117), Tainan, Taiwan. October, 2015.
- [13] Chen-Li Chiang, Ming-Li Wu, Chuh-Yean Chen\*, and Tzu-Yao Shih, "PREPARATION OF SILVER SULFIDE NANOPARTICLES ON A CHELATING POLYMER FILM", 2015 International Symposium on Novel and Sustainable Technology, PC-017 (page 118), Tainan, Taiwan. October, 2015.
- [14] Chen-Li Chiang, Ming-Li Wu, Chuh-Yean Chen\*, and Ting-Ling Yao, "PREPARATION OF COTTON FIBERS CONTAINING SILVER NANOPARTICLES WITH ANTIBACTERIAL ACTIVITY", 2015 International Symposium on Novel and Sustainable Technology, PC-018 (page 119), Tainan, Taiwan. October, 2015.
- [15] Chen-Li Chiang, Chuh-Yean Chen\*, and Cheng-Liang Zheng, "PREPARATION OF SILVER NANOPARTICLES ON THE SURFACE OF A POLYMER FILM", 2014 International Symposium on Novel and Sustainable Technology, PA-030, Tainan, Taiwan. October, 2014.
- [16] Chen-Li Chiang, Chuh-Yean Chen\*, An Lin, and Pei-Chen Chou, "SILVER NANOPARTICLES SYNTHESIZED FROM CHELATING POLYMER", 2014 International Symposium on Novel and Sustainable Technology, PA-029, Tainan, Taiwan. October, 2014.
- [17] Chen-Li Chiang, Chuh-Yean Chen\*, and Tzu-Han Liu, "PREPARATION OF SILVER SULFIDE NANOPARTICLES ON A POLYMER FILM CONTAINING IMINODIACETATE GROUPS", 2014 International Symposium on Novel and Sustainable Technology, PA-031, Tainan, Taiwan. October, 2014.
- [18] 江禎立、陳志彥\*、吳皇慶，"側鏈含三乙基四胺之螯合樹脂吸附 Cd(II)之研究"，2014 年 中華民國高分子學會年會、2014 Annual Meeting of the Polymer Society、第 37 屆高分子學術研討會，PE-072 (page 352)。 2014 年 1 月

- [19] 江禎立、陳志彥\*、陳睿麒，"側鏈具 2-(2-胺基乙氧基)乙醇之螯合樹脂回收銀離子之研究"，2014 年 中華民國高分子學會年會、2014 Annual Meeting of the Polymer Society、第 37 屆高分子學術研討會，PE-073 (page 353)。 2014 年 1 月
- [20] Chuh-Yean Chen\*, Chen-Li Chiang. Jia-Hong Sun, "Preparation Of Silver Nanoparticles On A Copolymer Film Containing Chelating Groups", 2013 International Symposium on Nano Science and Technology, , PA-014, Tainan, Taiwan. November, 2013.
- [21] 陳志彥\*、江禎立、劉姿韓、王曉彬，"含羥乙基乙二胺之螯合樹脂吸附 Ni<sup>2+</sup>之研究"，中國化學會高雄分會 2013 年會暨十大基礎工業技術研討會，D-03 (page D3)，台南市。 2013 年 5 月
- [22] 陳志彥、江禎立、孫嘉宏、鄭丞良、楊文廷，"側鏈具丙胺酸之螯合樹脂吸附 Ni<sup>2+</sup>之研究"，中國化學會高雄分會 2013 年會暨十大基礎工業技術研討會，D-04 (page D4)，台南市。 2013 年 5 月
- [23] 陳志彥、江禎立、陳致元、郭恬綺、孫嘉宏，"以側鏈具甘胺酸之新穎單體製備奈米銀/高分子複合材料"，2013 中華民國高分子學會年會, 2013 Annual Meeting of the Polymer Society, 第三十六屆高分子學術研討會，PF1-036 (page 410)，嘉義縣民雄鄉。 2013 年 1 月