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Xi Chun Zhou

Professional Experience

- 05/2001---Present **Research Associate**, Oak Ridge National Laboratory, Oak Ridge, TN 37830
- Developing oligonucleotide microarrays for microbial community analysis;
 - New technique for fabricating DNA and protein chips;
 - Developing biosensors for microbial detectors.
- 09/2000---05/2001 **Research Associate**, Department of Chemistry, Cambridge University, UK
- Development of novel biosensor based on acoustic device.
 - Bioconjugate chemistry for covalent bonding biomolecules (protein and DNA) onto metal nanoparticles and microsphere particles for bioassays.
- 02/98---09/2000 **Research Fellow**, Institute of Materials Research & Engineering, Singapore
- PI of project "fabrication of Nanoscale biosensors for environmental pollutants monitoring, clinical diagnostics, and bioassay" funded by National Science & Technology Board of Singapore.
 - Co-supervisor of two postgraduates from National University of Singapore
 - Nanoconstructed thin films by self-assembly of biomolecule-modified colloidal particles and the application in biosensing.
 - Novel method for preparation of artificial biomolecular membranes based on self-assembly technology.
 - Manage the cooperation with other companies during technology development
 - One patents filed.
- 06/95---02/98 **Postdoctoral Fellow**, Department of Chemistry, National University of Singapore
- Conduct the research project of "Preparation and Interface Characterization of Thin Film Layers and the Applications to Construction of Chemical Sensors and Biosensors" that was funded by National Science & Technology Board of Singapore
 - Supervised laboratory safety practices & hazardous waste disposal; conducted maintenance & trouble shooting of analytical instruments.
- 07/94---06/95 **Lecturer**, Department of Chemistry, Wuhan University, P.R.C.
- Organized and led a research team on the research project of "Synthesis of Novel Molecular probes for optical sensors" funded by National Natural Science Board of China
 - Taught the course "Instrumental Analysis for Material Surface" for 80 undergraduate students
 - Supervised laboratory safety practices & hazardous waste disposal; conducted maintenance & trouble shooting of analytical instruments
- 07/88---06/94 **Research Assistant**, Department of Chemistry, Wuhan University, P.R. China
- Synthesis of novel crown ether anchored polysiloxanes as GC and HPLC stationary phases and solid-phase extraction materials

- Studies of the surface properties, thermal properties of the polysiloxane coating layer.
- Synthesis of chiral polysiloxane stationary phases as GC and HPLC stationary phases Performed field and laboratory analysis of samples with various instruments.

Technical Skills

- * Chromatography (GC & HPLC)
- * Infrared Spectroscopy (IR)
- * Nuclear Magnetic Resonance (NMR)
- * UV-Vis & Fluorescence Spectrophotometry
- * SEM and AFM
- * Electrochemical Analysis
- * Thermal Analysis Technique
- * X-ray Photoelectron Spectrometry
- * Ellipsometry Spectroscopy
- * Raman Spectroscopy

Education

B.Sc. in Chemistry, 1984--1988, *Wuhan University, P.R. China*

M.Sc. in Analytical Chemistry, 1988-1991, *Wuhan University, P.R. China*

Ph.D. in Physical Chemistry, 1991-1994, *Wuhan University, P.R. China*

Area of specialization: Physical chemistry, Organic Chemistry, and bioanalytical chemistry.

Computer Skills

Environment: MS-WINDOWS, MS-DOS, INTERNET, Applications: EXCEL, CHEMWIN WordPerfect, PowerPoint.

Professional Memberships

- Membership of American Chemical Society
- Membership of American Association for the Advancement of Science
- Membership of New York Academy of Sciences
- Membership of Chinese Chemical & Chemical Engineering Society

Selected Publications

1. X.C. Zhou, C. Lan, S.F.Y. Li, "Large Improvement of the Lower Detection Limit of Microgravimetric DNA Biosensor Using Oligonucleotide-Functionalized Au Nanoparticle or Biotin-Functionalized Au Nanoparticle". *Biosensors & Bioelectronics*, Submitted
2. X.C. Zhou, L.Q. Huang, S.F.Y. Li, "Microgravimetric DNA sensor based on quartz crystal microbalance: comparison of oligonucleotide immobilization methods and the application in genetic diagnosis". *Biosensors & Bioelectronics*, 16(1-2) 85-95, 2001.
3. X.C. Zhou, L. Cao, "High Sensitivity Portable Microbiosensor for Qualitative and Quantitative Diagnostic Detection of Polychlorinated Dibenzo-p-dioxins". *The Analyst*, 126 (1) 74-78. 2001.

4. L. Cao, X.C. Zhou, S.F.Y. Li 'Enantioselective sensor based on microgravimetric quartz crystal microbalance with molecularly imprinted polymer film'. **The Analyst**, 126 (2) 184-188, 2001.
5. X.C. Zhou, X. H. Zhou, C. L. Xia 'Determination of the Enantiomeric Composition of Chiral Compounds by Quartz Crystal Microbalance Sensors Based on Molecularly Imprinted Polymers as Recognition Elements', **Sensors and Actuators B**, submitted.
6. X.C. Zhou, S.C. Ng, H.S.O. Chan and S.F.Y. Li, "Molecular Interaction and Specificity of Vapour-phase molecules on Self-assembled Composite Monolayers of ω -position Functionalized molecules Immobilized on Quartz Crystal Microbalance", **Surface Science**, In Press.
7. X.C. Zhou, S. J. O'Shea, S.F.Y. Li, "Amplified microgravimetric gene sensor using Au nanoparticle modified oligonucleotides". **Chem. Commun.** 2000, 953-954
8. S.C. Ng, X.C. Zhou, Z.K. Chen, P. Fu, P. Miao, S.F.Y. Li and H.S.O. Chan, "Quartz Crystal Microbalance Sensor Deposited With Langmuir-Blodgett (LB) Films of Conducting Polymers and Application to Heavy Metal ions Analysis", **Langmuir**, 14 (1998) 1748-1752
9. L. Yan X.C. Zhou Quartz crystal microbalance sensor deposited with LB films of functional polymers for the detection of phenols in vapour phase, **CHEMICAL RESEARCH IN CHINESE UNIVERSITIES** 14 (4): 433-437, 1998
10. X.C. Zhou, S.C. Ng, H.S.O. Chan and S.F.Y. Li, "Piezoelectric Sensor Sensitive to Organic Amines in Aqueous Phase Based on a Polysiloxane Coating Incorporating Acidic Functional Groups", **Anal. Chim. Acta**, 345 (1997) 29-35
11. X.C. Zhou, L. Zhong, S.C. Ng, S.F.Y. Li and H.S.O. Chan, "Organic Vapor Sensors Based on Quartz Crystal Microbalance with Self-Assembled Monolayers", **Sensors and Actuators B**, 42 (1) (1997) 59.
12. X.C. Zhou, S.C. Ng, H.S.O. Chan and S.F.Y. Li, "Detection of Organic Amines in Liquid with Chemically Coated Quartz Crystal Microbalance", **Sensors and Actuators B**, 42 (1997) 137-144.
13. X.C. Zhou, C.Y. Wu, H. Yan, X.R. Lu and Y.Y. Chen "Gas Chromatographic Enantiomer Separation on Polysiloxane-Anchored Chiral Crown Ether (Chirasil-man-18C6-25)", **Journal of High Resolution Chromatography**, 19 (1996) 643-646.
14. X.C. Zhou, H. Yan, C.Y. Wu, X.R. Lu and Y.Y. Chen "Chiral crown ether anchored polysiloxanes for enantiomeric separation in capillary gas Chromatography", **J. Chromatography A**, 753 (1996) 269-277.
15. X.R. Lu, L.F. Zhang, X.C. Zhou, C.Y. Wu and Y.Y. Chen, "properties of crown ether anchored polysiloxanes", **Chemical Research in Chinese Universities**, 10(2) (1994) 163-166.
16. X.C. Zhou, C.Y. Wu and Y.Y. Chen, "Review- The application of crown ether as chromatography stationary phases", **SePu (Chinese J. Chromatography)**, 6 (1993) 53-54.
17. X.C. Zhou, H. Yan, C.Y. Wu and Y.Y. Chen, "GC enantiomeric separation based on novel chiral crown ether bounded polysiloxane stationary phases" **FENXI HUAXUE (Chinese Journal of Analytical Chemistry)**, 24 (1996) 367-432
18. X.C. Zhou, H. Yan, C.Y. Wu, X.R. Lu and Y.Y. Chen, "Synthesis and chromatographic characteristics of chiral stationary phases containing crown ether group", **SePu (Chinese journal of Chromatography)**, 13 (1995) 337.
19. X.C. Zhou, H. Yan, C.Y. Wu and Y.Y. Chen, "Two new chiral polysiloxanes containing chiral crown ethers for capillary gas chromatography" **SePu (Chinese journal of Chromatography)**, 12(6) (1994) 403.

20. X.C. Zhou, C.Y. Wu, X.R. Lu and Y.Y. Chen, "A novel method for preparation of amide-polysiloxanes as chiral stationary phases", **Chinese Chemical Acta** 8 (1994) 320-326.
21. X.C. Zhou, C.Y. Wu, X.R. Lu and Y.Y. Chen, "Review--Application of Crown Ether Compounds as Gas Chromatographic Stationary Phases", **J. Chromatography A**, 662 (1994) 203-218.
22. C.Y. Wu, X.C. Zhou, Z.R. Zeng, X.R. Lu and L.F. Zhang, "Preparation and Study of Two Benzocrown Ether Polysiloxane Stationary Phases for Capillary Gas Chromatography", **Anal. Chem.**, 63 (1991) 1874-1879.

Book chapters:

X.C. Zhou, L.F. Zhang, "Polymeric Coatings for Capillary Electrophoresis(CE)", in *Dekker Encyclopedia of Chromatography*, p777-778. J. Cazes, Ed; Marcel Dekker, Inc., New York.

Patents:

1. Nanostructured thin films by self-assembly of DNA modified colloidal particles and the application in gene sensing, Singapore Patent Application No 9901211-5 (March, 1999)