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Assistant Research Fellow

助研究員

Division of Key Technology Development

Education and Positions

- Ph.D., Chemistry, National Taiwan University, 2001
- Postdoctoral Fellow, Institute of Atomic and Molecular Sciences (IAMS), Academia Sinica, 2001-2005
- Postdoctoral Fellow, National High Magnetic Field Laboratory (NHMFL), Florida State University, U.S.A. 2002-2003
- Assistant Research Fellow, Genomics Research Center, Academia Sinica, 2005-present

Received Awards

Title	Institute	Year
Outstanding Students Conference Travel Grant	The Foundation for the Advancement of Outstanding Scholarship	2000
Advanced Abroad Research Fellowship	The National Science Council, Taiwan	2002-2003
Outstanding Post-Doctor Researchers Conference Travel Grant	The Foundation for the Advancement of Outstanding Scholarship	2002, 2004

Research Interests

Reaction dynamics study of biomolecules and development of bio mass spectrometry

The reaction mechanism of biomolecules in matrix-assisted laser desorption/ionization (MALDI) method is an unresolved mystery although it has been used extensively in biological mass spectrometry. We endeavor to study this fundamental problem of MALDI method as well as fragmentation behaviors of biomolecules under intense laser interrogation by conducting crossed molecular beam method, and attempt to further innovate the mass spectrometric technology today. Contemporaneously, we are seeking to develop new methodologies for accurate mass detection, as well as for disease diagnosis and in vivo, real-time study of therapeutic response base on mass spectrometry.

基質輔助雷射脫附/游離法 (MALDI) 是蛋白質質譜分析上最重要的離子源，但是其脫附/游離機制至今仍未被完全理解，其中的問題包含了複雜的生物分子解離動力學、基質與生物分子的共晶過程等等。本實驗室將運用交叉分子束的概念，研究 MALDI 方法的解離機制，並更進一步研究氣態生物分子的光解離性質，期以此研究突破生物質譜技術的偵測瓶頸。此外，本實驗室也進行新生物質譜技術研發，未來也將致力於開發質譜儀與其他研究設備的連結介面，期能幫助鑑定疾病並監測治療反應。

Selected Publications

Wang, Y.-S.; Jiang, J. C.; Cheng, C.-L.; Lin, S. H.; Lee, Y. T.; Chang, H.-C. "Identifying 2- and 3-coordinated H_2O in protonated ion-water clusters by vibrational predissociation spectroscopy and *ab initio* calculations", *J. Chem. Phys.* **1997**, *107*, 9695-9698.

Wang, Y.-S.; Chang, H.-C.; Jiang, J. C.; Lin, S. H.; Lee, Y. T.; Chang, H.-C. "Structures and isomeric transitions of $NH_4^+(H_2O)_{3-6}$: From single to double rings", *J. Am. Chem. Soc.* **1998**, *120*, 8777-8788.

Chang, H.-C.; Wang, Y.-S.; Lee, Y. T.; Chang, H.-C. "Studying protonated ion hydration by infrared spectroscopy of size-selected $NH_4^+(H_2O)_n$ clusters in a free jet expansion", *Int. J. Mass Spectrom.* **1998**, *179/180*, 91-102.

Jiang, J. C.; Wang, Y.-S.; Chang, H.-C.; Lin, S. H.; Lee, Y. T.; Niedner-Schatteburg, G.; Chang, H.-C. "Infrared spectra of $H^+(H_2O)_{5,8}$ clusters: Evidence for symmetric proton hydration", *J. Am. Chem. Soc.* **2000**, *122*, 1398-1410.

Chaudhuri, C.; Wang, Y.-S.; Jiang, J. C.; Lee, Y. T.; Chang, H.-C.; Niedner-Schatteburg, G. "Infrared spectra and isomeric structures of hydroxide ion-water clusters $OH(H_2O)_{1-5}$: a comparison with $H_3O^+(H_2O)_{1-5}$ ", *Mol. Phys.* **2001**, *99*, 1161-1173.

Wang, Y.-S.; Tsai, C.-H.; Lee, Y. T.; Chang, H.-C.; Jiang, J. C.; Asvany, O.; Schlemmer, S.; Gerlich, D. "Investigations of protonated and deprotonated water clusters using a low-temperature 22-pole ion trap", *J. Phys. Chem. A* **2003**, *107*, 4217-4225.

Wu, C.-C.; Wang, Y.-S.; Chaudhuri, C.; Jiang, J.-C.; Chang, H.-C. "Microsolvation of the lithium ion by methanol in the gas phase", *Chem. Phys. Lett.* **2004**, *388*, 457-462.

Friedrich, J.; Fu, J. M.; Hendrickson, C. L.; Marshall, A. G.; Wang, Y.-S. "Time Resolved Laser-Induced Fluorescence of Electrosprayed Ions Confined in a Linear Quadrupole Ion Trap", *Rev. Sci. Instrum.* **2004**, *75*, 4511-4515.

Lin, C. K.; Wu, C. C.; Wang, Y.-S.; Lee, Y. T.; Chang, H.-C.; Kuo, J. L.; Klein, M. L. "Vibrational predissociation spectra and hydrogen-bond topologies of $H^+(H_2O)_{(9-11)}$ " *Phys. Chem. Chem. Phys.* **2005**, *7*, 938-944.