Réunions scientifiques

Séminaires

Séminaire SOLEIL

Tunable Synchrotron VUV Photoionization Mass Spectrometry and Its Opportunities

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Invité par Laurent NAHON

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Traditional mass spectrometers with electron impact ionization are limited in their utility by fragmentation, limited electron energy resolution, and low ionization cross-section at chemically interesting ionization thresholds (6-14 eV). Synchrotron VUV photoionization is a kind of "soft" process, which is a *universal* and *selective* method for detecting both stable and radical species. Isomers can be distinguished by measurement of photoionization efficiency spectra. The synchrotron VUV photoionization combining with molecular-beam mass spectrometry is potentially a powerful tool for studies of combustion intermediates and low-temperature plasma diagnostic.[1-3]

Moreover, a new method combining IR laser desorption with tunable synchrotron vacuum ultraviolet photoionization mass spectrometry has been developed and successfully applied for the analysis of a number of different organic compounds, including polycyclic aromatic hydrocarbons, quinones, drugs, nucleic acid bases, nucleosides, amino acids, vitamins and other heterocyclic molecules. The method provides mass analysis without any matrix and sample preparation. Fragment-free photoionization mass spectrometric analysis can be accomplished by near-threshold photoionization, from which isomeric structures in complex organic mixtures can be distinguished. In addition, molecular fragmentation can be selectively produced with varying photon energy, which would be useful for the identification of the molecular structure.[4-5]

References

[1] Enols are common intermediates in hydrocarbon oxidation, **Science** 308, 1887-1889 (2005).

[2] A comprehensive experimental study of low-pressure premixed C3-oxygenated hydrocarbon flames with tunable synchrotron photoionization, ***Combustion and Flame*** 152, 336-359 (2008).

[3] Interstellar enols are formed in plasma discharges of alcohols, ***The Astrophysical Journal*** 676, 416-419 (2008).

[4] Fragment-controllable mass spectrometric analysis of organic compounds with an infrared laser desorption/tunable vacuum ultraviolet photoionization technique, ***Rapid Communications in Mass Spectrometry*** 22, 1619-1623 (2008).

[5] The characterization of selected drugs with IR laser desorption/ tunable synchrotron VUV photoionization mass spectrometry, ***Rapid Communications in Mass Spectrometry*** 22, 2515-2520 (2008).

Formalités d'entrée *: accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi Soleil du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).*

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