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On-line photoionization mass spectrometry and its applications on catalysis, pyrolysis and matrices analysis

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Photoionization mass spectrometry (PIMS) has become a prominent technique for many years. Owing to its favorable characteristics (i.e., softness, no polarity discrimination, and reduced ion suppression) in contrast with other available ionization sources such as electrospray ionization, PIMS has been widely adopted by scientists for many mass spectrometric applications. Recently, PIMS has been applied for the online analysis of the chemical components and their highly dynamic processes during pyrolysis and combustion of various fuels. Compared with traditional hard electron ionization methods for the gaseous components analysis, photoionization produces little or no fragments, making the identification and interpretation of complex ingredients in real-time possible. In this work, both commercial available discharge Kr lamp and synchrotron radiation with high brightness and wide energy spectrum were used as light sources for on-line PIMS studies, at the mass spectrometric end station of National Synchrotron Radiation Laboratory (NSRL) of China. Our work is mainly focused on three aspects: Heterogeneous catalytic reactions, such as Fischer-Tropsch synthesis and oxidative coupling of methane; pyrolysis/combustion of biomass, municipal waste polymers, and cigarettes; fast qualitative and quantitative analysis of chemicals in complex matrices, such as food, soil, and natural products.

Biography

Yang Pan has completed his PhD at University of Science and Technology of China. He is an Associate Professor at University of Science and Technology of China (USTC), and the Director of Mass Spectrometry Division of National Synchrotron Radiation Laboratory (NSRL) focusing on "Development of photoionization mass spectrometric techniques". He has published more than 50 papers in reputed journals.

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