Microchip Atmospheric Pressure Photoionization for Analysis of Petroleum by FT-ICR Mass Spectrometry

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Introduction
Atmospheric pressure photoionization (APPI) Fourier transform-ion cyclotron resonance mass spectrometry (FT-ICR MS) has significantly contributed to the molecular speciation of petroleum. However, a typical APPI source operates at 50 μL/min flow rate and thus, causes a considerable mass load to the mass spectrometer. Recently introduced microchip APPI (μAPPI) operates at much lower flow rates (0.05-10 μL/min) providing decreased mass load and therefore decreased contamination in analysis of petroleum by FT-ICR MS. In spite of 25 times lower flow rate, the signal response with μAPPI was only 40% lower than with conventional APPI source (see Figure). Moreover, μAPPI provides more efficient vaporization of higher molecular weight components in petroleum than the conventional APPI source.

Experimental
Electrospray ionization mass spectra were acquired with the NHMFL 9.4 T custom-built FT-ICR mass spectrometer.

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Reference