

# 質子轉移反應質譜儀的原理與應用

## The Principles and Applications of Proton Transfer Reaction Mass Spectrometer (PTR-MS)

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摘要.

質子轉移反應質譜儀能對揮發性有機化合物(VOCs)進行定量的線上監測，與常見的質譜儀主要差異，在於質子轉移反應質譜儀是運用較軟性的離子化方法將有機分子離子化。此方法最大的優點，除能立即偵測出分析物確切的濃度之外，就是其分裂片段較少，能夠更容易且更明確的定量分析物。這項新技術能即時的(幾秒內)監測複雜基質中的多樣化有機物，偵測極限可低至萬億分之一(ppbv)，應用範圍包含環境分析、食品研究以及藥物分析。

### **Abstract**

Proton transfer reaction-mass spectrometer (PTR-MS) is capable of quantitatively on-line monitoring volatile organic compounds (VOCs). The fundamental difference between a conventional MS and PTR-MS is the "soft ionization" method used by PTR-MS to ionize the organic molecules. The advantage of this method, besides immediately yielding absolute concentration, is that fragmentation of the molecules is very much reduced so the mass spectra produced are much easier to interpret and are more straightforward to quantify. This novel technique enables a variety of organic species in complex matrices to be monitored in real-time (within seconds), with detection limits as low as a few parts per trillion, volume (pptv). PTR-MS extend its applicability to broad fields such as environment analysis, food research, and medical application