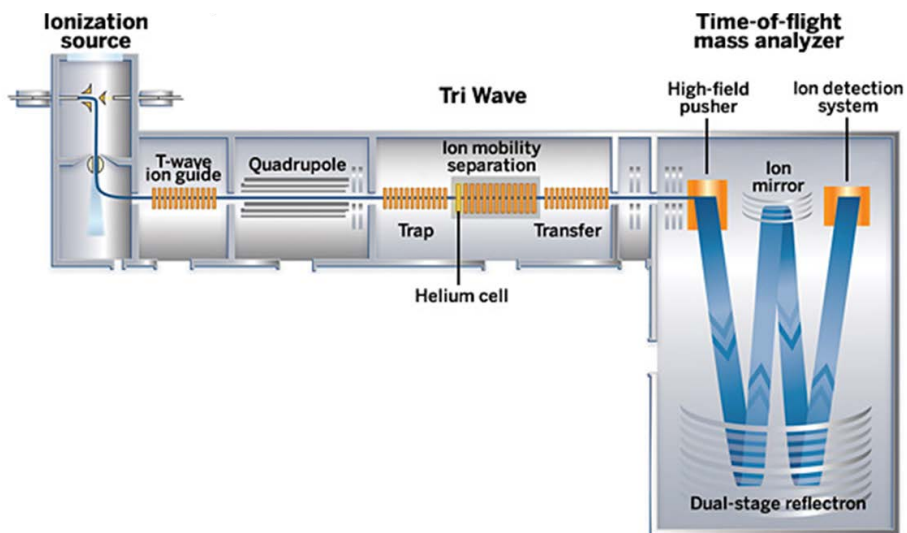


PTR-TOF Mobile Laboratory System

Overview

The Proton Transfer Reaction – Time of Flight Mass Spectrometry (PTR-TOF) mobile laboratory system is an analytic laboratory in a commercial van, providing real-time vapor analysis. The mobile laboratory includes LICOR CO₂ direct-reading instruments (DRI) and can perform near real-time detection of 56 of the Hanford Site's 59 chemicals of potential concern (COPCs). The PTR-TOF is sensitive to mass only and requires other instrumentation, such as the Gas Chromatograph - Mass Spectrometer (GC-MS), to identify chemical-vapors species. While the PTR-TOF is a real-time measurement, the GC-MS is not. Therefore, results are only useful once the data has been thoroughly analyzed, which requires two to three days. This unique detection technology is especially useful because of its high-fidelity detection, number of COPCs detected, and ability to characterize specific vapor release sources and/or "chase" plumes.



The real-time results from the mobile laboratory will be compared to the real-time data from the DRIs and optical spectra instruments deployed in the pilot-scale test and later compared to the laboratory analysis results from the autosampler (whole-air grab samples analyzed by independent GC-MS). The mobile laboratory will be deployed directly to sensitive areas where vapors and odors or suspected emissions are postulated and expected. In addition, the system will be configured to analyze the AP Farm exhaust stack and A Farm passive breather filters.

Capabilities/Features

- Mobile vehicle, self-powered, near real-time analytic laboratory
- PTR-MS, GC-MS, CO₂ sensor
- Whole-air sampling
- Integrated meteorological station and GPS
- Single-digit pptv-level sensitivity for most volatile organic compounds
- Real-time quantitative analysis by mass, one-day absolute quantitative analysis
- No sample preparation
- PTR-MS with real-time data; response time of less than 1 second
- Down to parts per trillion concentration by volume
- Most of the compounds on the greater list of Hanford COPCs and carcinogens



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