Temperature Programmed Desorption (TPD) Application Note

MAX LT System on flange CF 63
It is available in 100, 200, 500 amu versions
(1000 amu on request)

Temperature Programmed Desorption (TPD), Flash Desorption (FD) and Pulsed Laser-Induced Desorption (PLID) studies are used to gather information about kinetic and/or thermodynamic processes occurring between an adsorbate (chemical) and substrate (surface). These analyses may be performed on very small surfaces, approximately 1 cm^2, at UHV pressures or on large semi-conductor wafers off of which resist may be desorbed from 4 inch wafers.

The mass spectrometer must:

- Be made from UHV compatible materials
- Have high resolving power, or
- Have high mass scanning capabilities
- Be able to perform selected ion monitoring (SIM) or
- Scan a broad mass range quickly
- Measure major components desorbing, but have the dynamic range and sensitivity to record minor components as well
- Have the ionizer situated close to the surface to ionize the gas flux coming off the surface before it disperses into the chamber
- Perform “soft” ionization to retain the molecular ion without fragmentation
- Electron Attachment (Option)
- Be able to detect both positive or negatively charged ions
- Plot spectra while recording surface temperature and chamber pressure
- Interface its data system with third-party hardware

Extrel CMS mass spectrometers use Tri-Filter™ Quadrupole mass filters for improved abundance sensitivity (the ability to separate adjacent masses to baseline).

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Extrel
Core Mass Spectrometers

Extrel's Merlin Automation™ data system offers powerful software control with the flexibility to customize it for a given application.

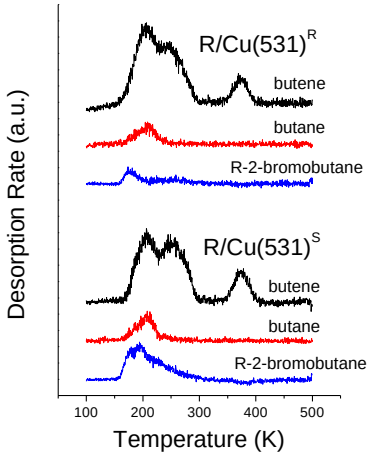

Figure 1: TPD experiment done under UHV conditions on a small surface showing enantioselectivity (data used by permission, Prof. Andrew Gellman, Carnegie Mellon University)

MAX Flange Mounted System

Extrel CMS offers:

- All UHV compatible materials
- Positive and Negative ion detection capabilities
- Continuous Dynode Electron Multiplier with 10^7 analog gain
- Analog signal detection over 7 decades of preamplifier range
- Pulse counting detection capabilities
- Overall sensitivity specification of 10^{-16} partial pressure detection
- Monitor up to 20 SIM mass or mass ranges
- On-axis or 90° off-axis mass filtering capabilities to eliminate interferences of stray electrons or photons from EI source
- Mass ranges available from *m/z* 1 - 60 up to 20 - 16,000 with 9 ½ or 19mm mass filter pole diameters
- Tri-Filter™ quadrupole mass filters offer abundance sensitivity up to 10^6
- Analog and digital inputs and outputs for reading and controlling external electronic components allow easy interfacing with third party controllers
- Triggered acquisition start synchronizes data and experimental processes

MAX LT Series of Flange Mounted Mass Spectrometers

A Real Mass Spectrometer for the price of an RGA.

The **MAX LT** system is the latest in Extrel's high resolution, high sensitivity, flange mounted Quadrupole Mass Spectrometers. Mounted on a 4 1/2 inch (63 CF) flange the **MAX LT** series is unbeatable in price and performance!

MAX LT System

It is available in 500 & 1000 amu versions