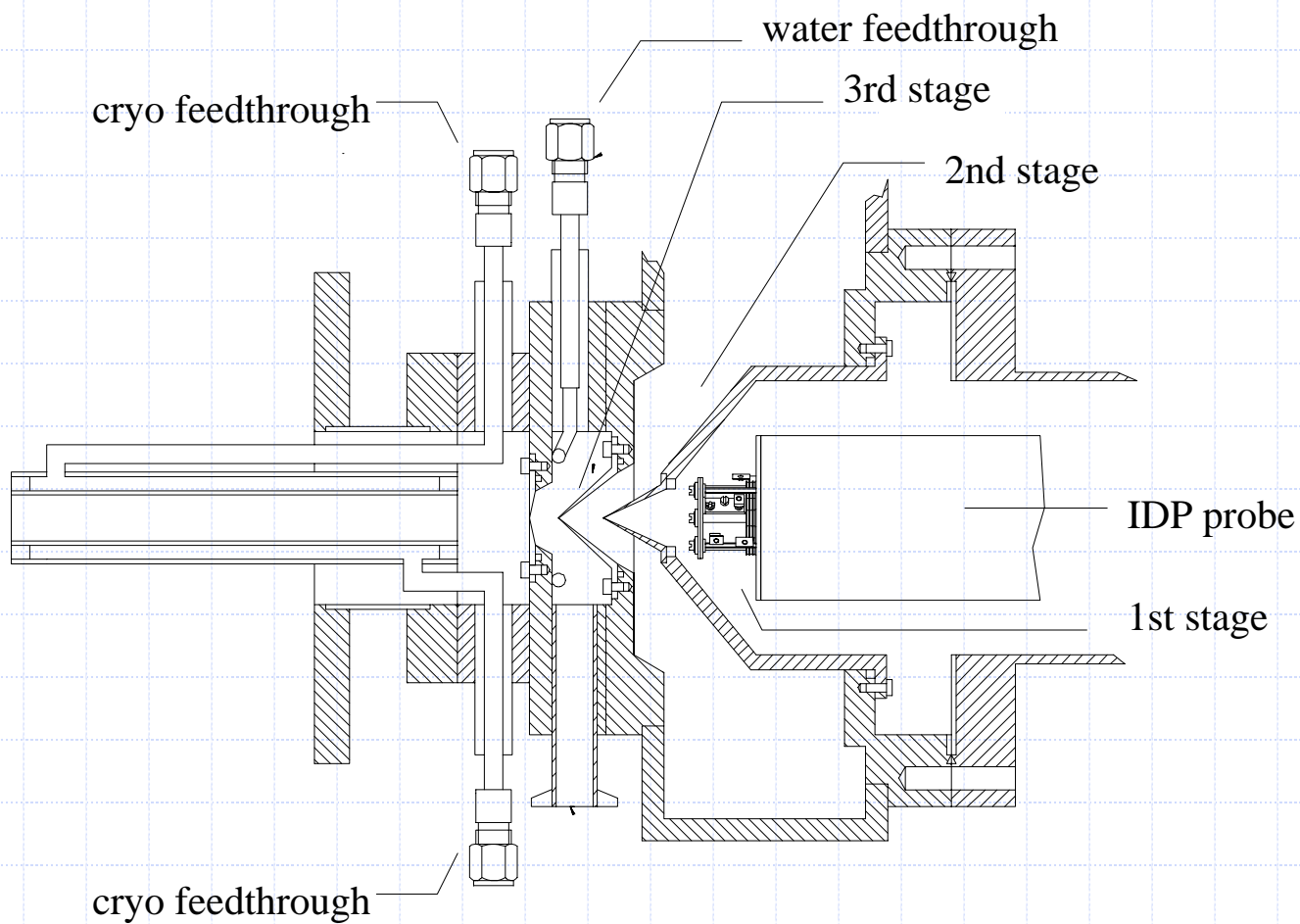# HPR-60
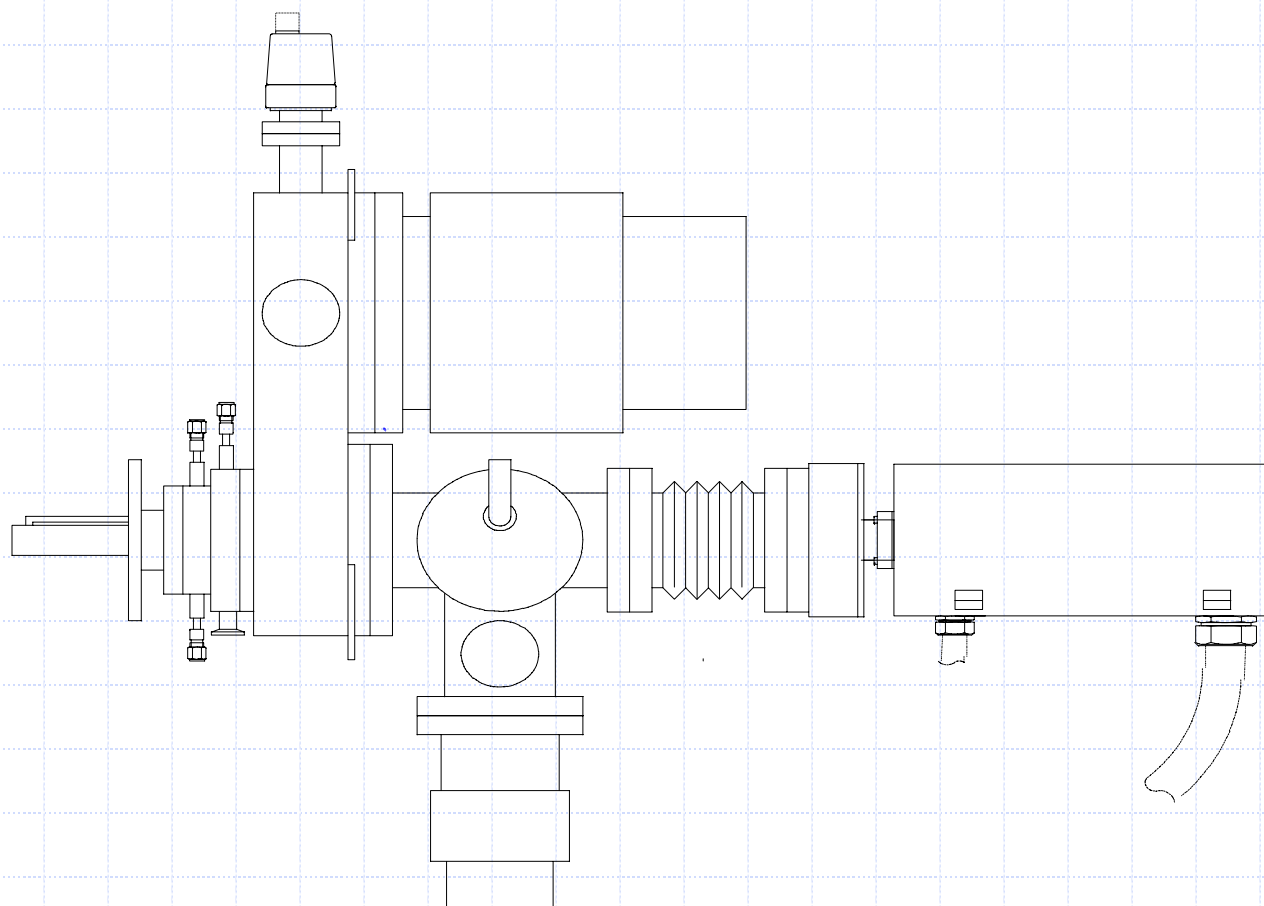## Molecular Beam Sampling Mass Spectrometer

- Reaction Kinetics

- Catalysis

- TPD/TPR/TPO

- TA-MS

- Gas Purity

- Environmental Gas Analysis
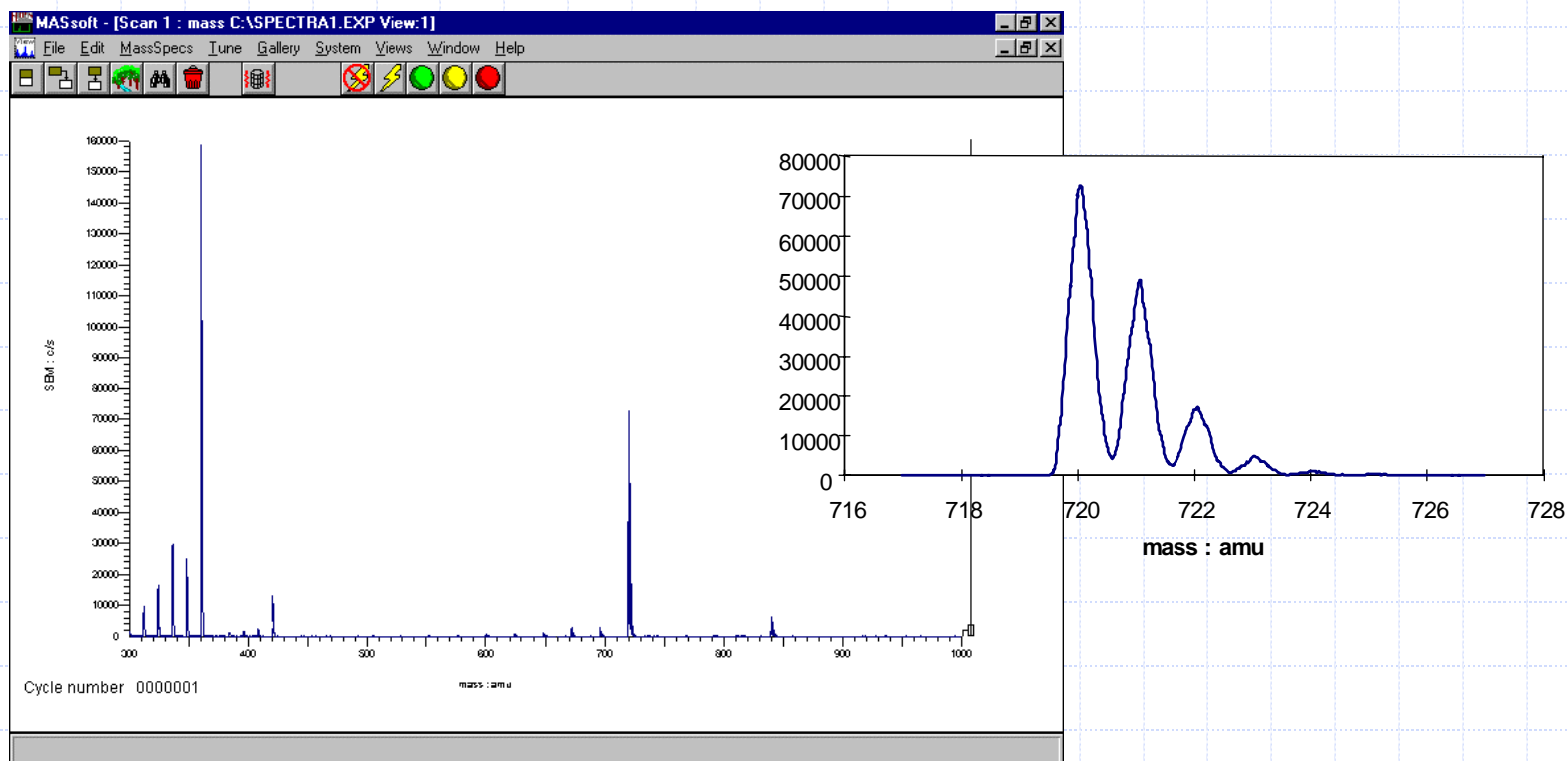
- Combustion

- CVD/MOCVD

HPR-60 detail

water feedthrough

cryo feedthrough

3rd stage

2nd stage

IDP probe

1st stage

cryo feedthrough
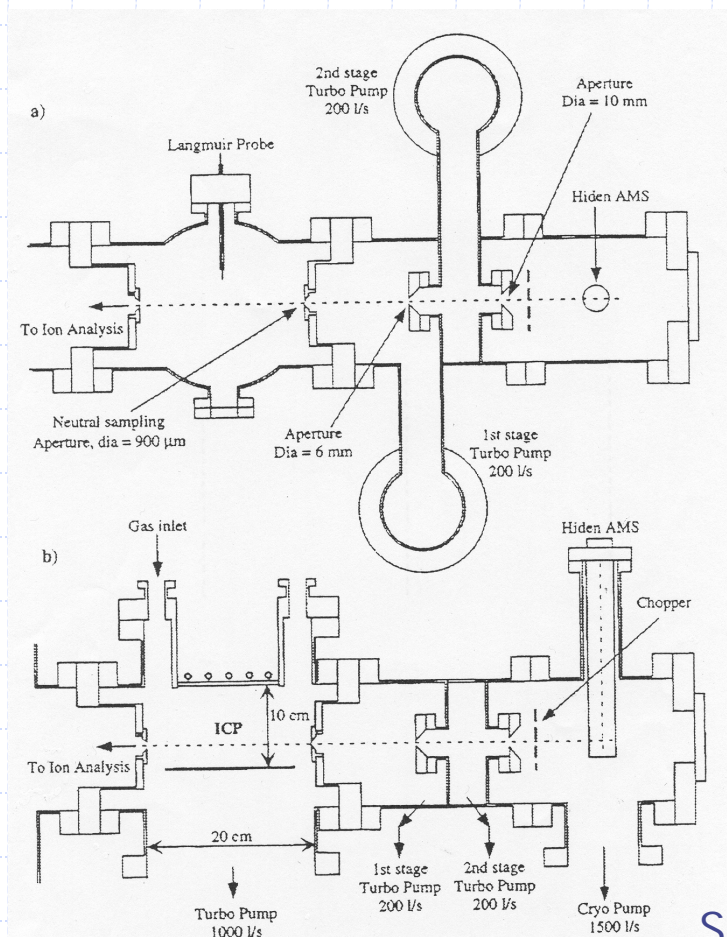
alignment bellows detail

application – carbon arc evaporation

mass spectrum from 300 - 1000 amu of Fullerene C60 produced from high pressure arc evaporation. The zoomed series of C60 peaks are identified as incorporating unto n=9 of the 13C isotope.
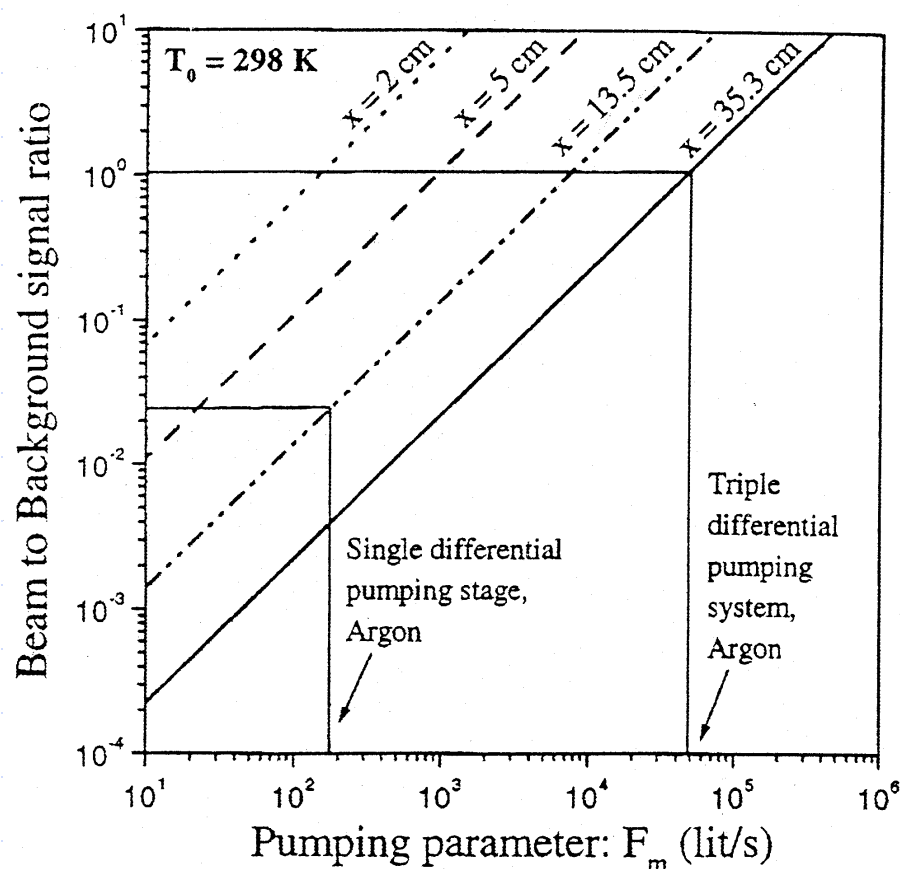
application – plasma sampling

schematic of plasma reactor and 3 stage differentially pumped line of sight mass spectrometer with cross beam ion source

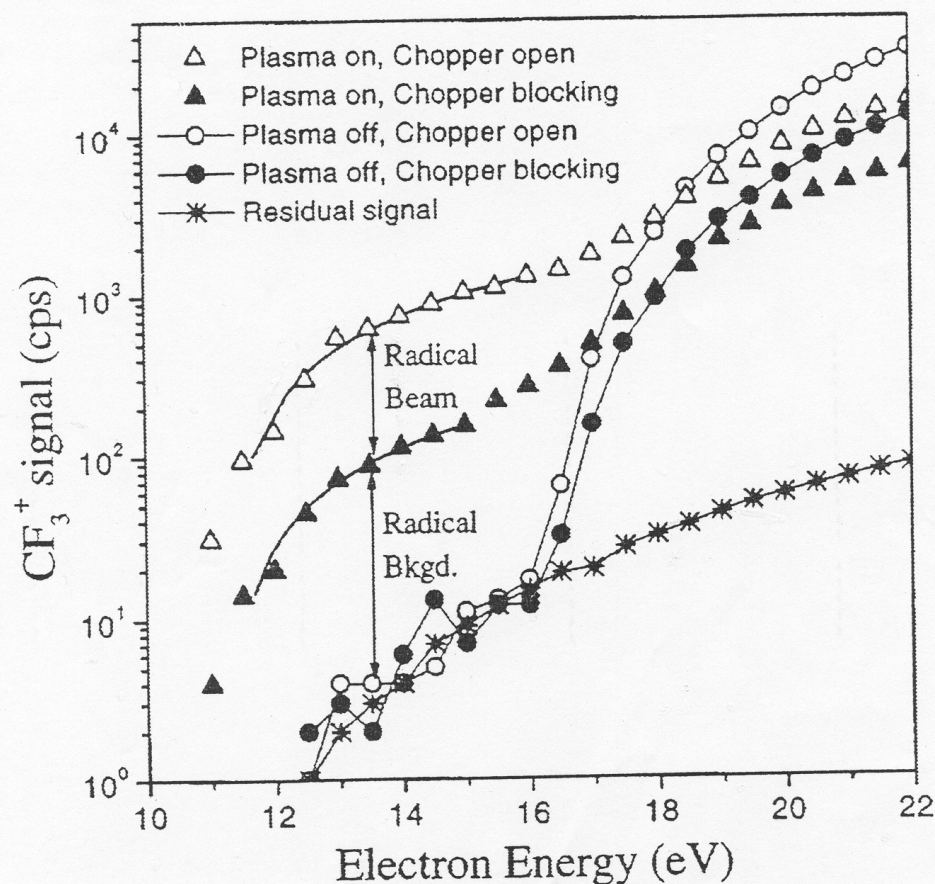Singh et al J. Vac. Sci. Tech. A17, 2447, (1999)

application – plasma sampling

beam to background measurements as a function of number of pumping stages and distance from skimmer to ion source

Singh et al J. Vac. Sci. Tech. A17, 2447, (1999)

application – plasma sampling

measurement
of plasma
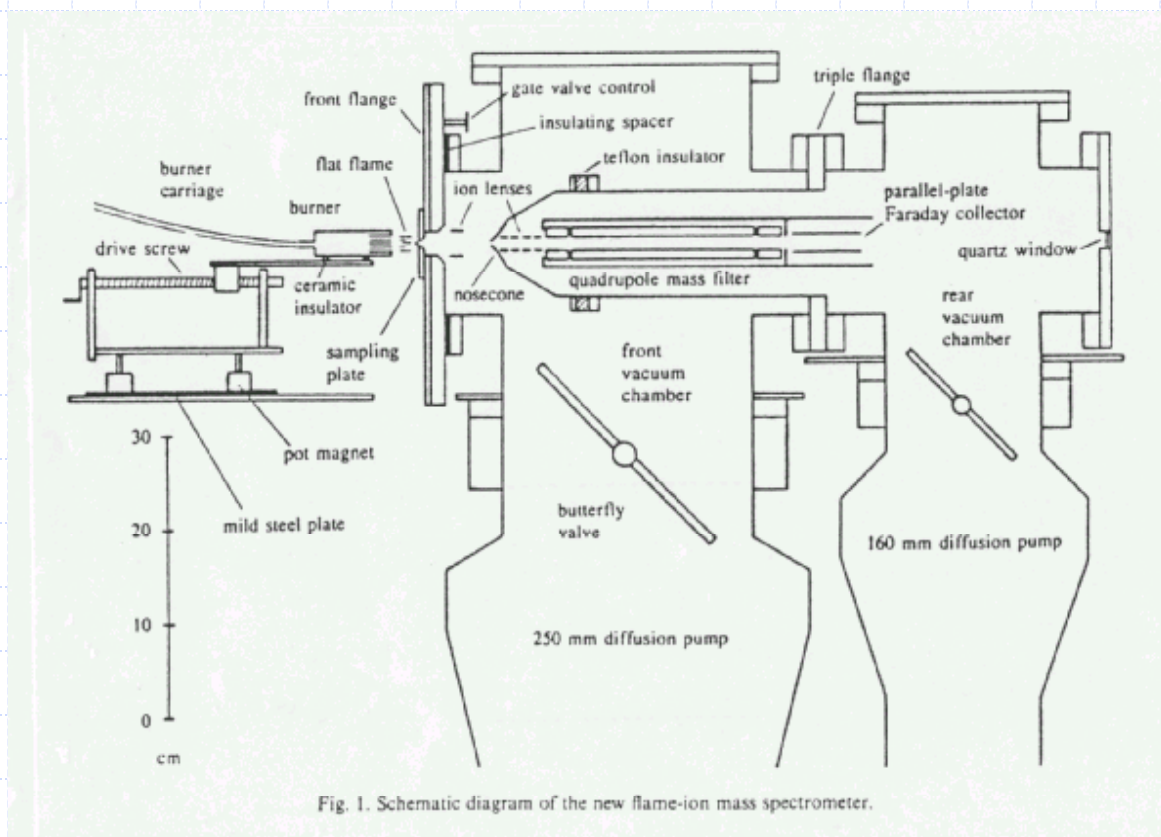radicals

application – combustion studies

Fig. 1. Schematic diagram of the new flame-ion mass spectrometer.

flame ionisation mass spectrometer

Goodings et al Int. J. Mass Spec. & Ion Proc. 132, 83, (1994)

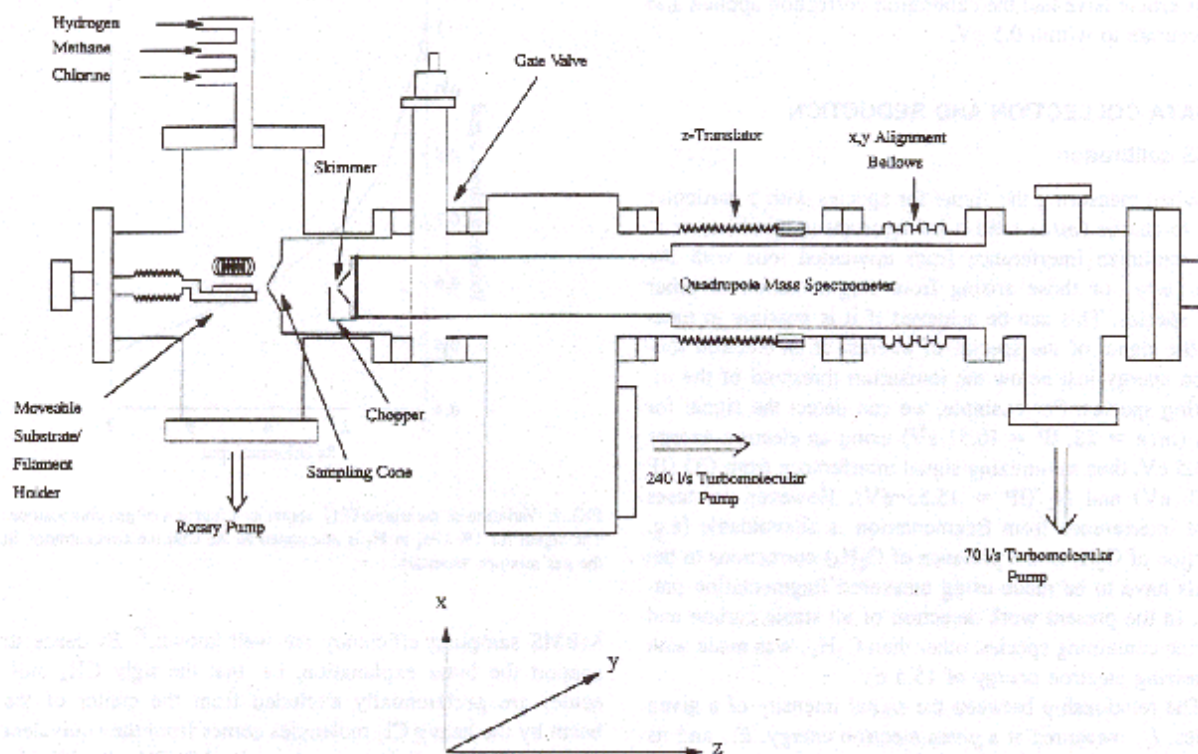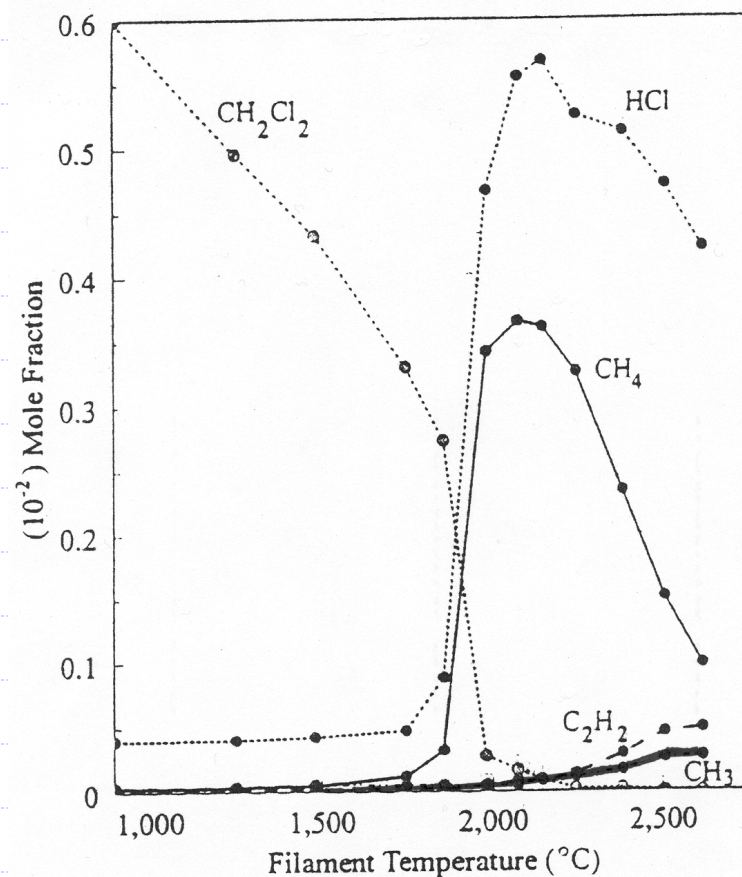# application – CVD diamond

FIG. 1. Schematic diagram of the molecular beam mass spectrometer coupled to the hot filament CVD reactor.

Rego et al Int. J. Appl. Phys.79, 7264, (1996)

www.HidenAnalytical.com

application – CVD diamond

stable gas species and methyl radicals as a function of filament temperature during CVD diamond deposition

Rego et al Int. J. Appl. Phys.79, 7264, (1996)

mass spectrometer options

	HAL/3F RC	HAL/3F PIC	EPIC	EQP
Detection Scheme	Analogue	Pulse Ion Counting	Pulse Ion Counting	Pulse Ion Counting
Measured	Neutrals Radicals	Neutrals Radicals	Neutrals Radicals +Ions -Ions retarding field energy analysis	Neutrals Radicals +Ions - Ions IED's

mass ranges to 2500 amu

ppb detection levels

| Parameters/Scans:	ppm Hydrogen 1	ppm Air 1	ppm Water 1	ppm Methane 1	ppm Oxygen 1	ppm CO2 1
Real time						
7:57:32 pm	31	3	4	0.7	0.4	0.7
7:58:42 pm	32	2	3	0.5	0.04	0.6
7:59:55 pm	33	3	3	0.7	0.5	1
8:01:14 pm	34	2	3	0.5	0.5	0.9
8:02:27 pm	37	4	3	0.5	0.3	0.6
8:03:40 pm	36	2	4	0.5	0.08	0.8
8:04:53 pm	32	3	3	0.9	0.2	0.9
8:06:06 pm	35	2	3	0.4	0.3	0.8
8:07:19 pm	34	2	3	0.7	0.4	0.5
8:08:32 pm	35	1	5	0.8	0.4	0.7
8:09:57 pm	37	2	3	0.6	0.3	0.7
8:11:15 pm	33	3	2	0.7	0.2	0.8
8:12:28 pm	34	3	3	0.7	0.2	1
8:13:41 pm	34	3	4	0.8	0.2	0.6
8:15:00 pm	32	2	2	0.9	0.1	0.8
8:16:19 pm	32	2	4	0.6	0.2	0.5
8:17:38 pm	33	3	4	0.6	0.2	0.6
8:18:51 pm	36	2	3	0.8	0.5	0.7
8:20:04 pm	31	3	4	0.8	0.3	0.8
8:21:23 pm	32	2	3	0.8	0.2	0.8
8:22:36 pm	35	3	4	0.5	0.4	0.7
8:23:49 pm	33	3	4	0.8	0.3	1
8:25:02 pm	37	2	3	0.8	0.3	0.8
8:26:15 pm	33	2	4	0.7	0.2	0.7
8:27:40 pm	31	2	4	0.5	0.3	0.8
8:28:59 pm	33	2	4	0.4	0.3	0.8
8:30:12 pm	37	3	2	0.5	0.2	0.9
8:31:25 pm	29	2	2	0.8	0.3	0.7

compact HPR-60 MBMS

software examples
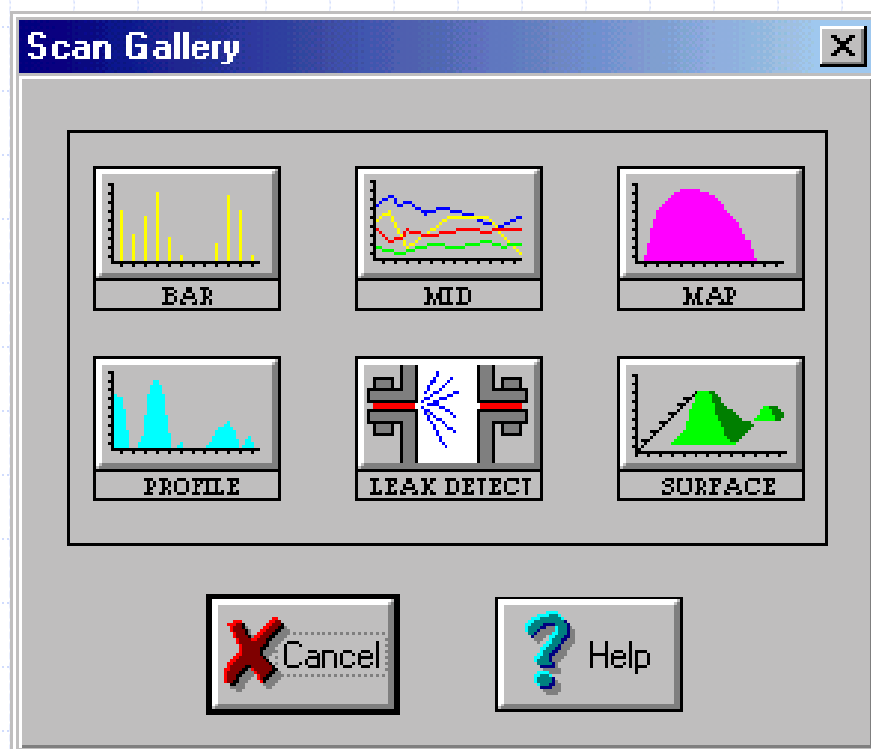
Scan Gallery

• simple 'Scan Gallery' provides rapid, easy to use set up of different types of scans.

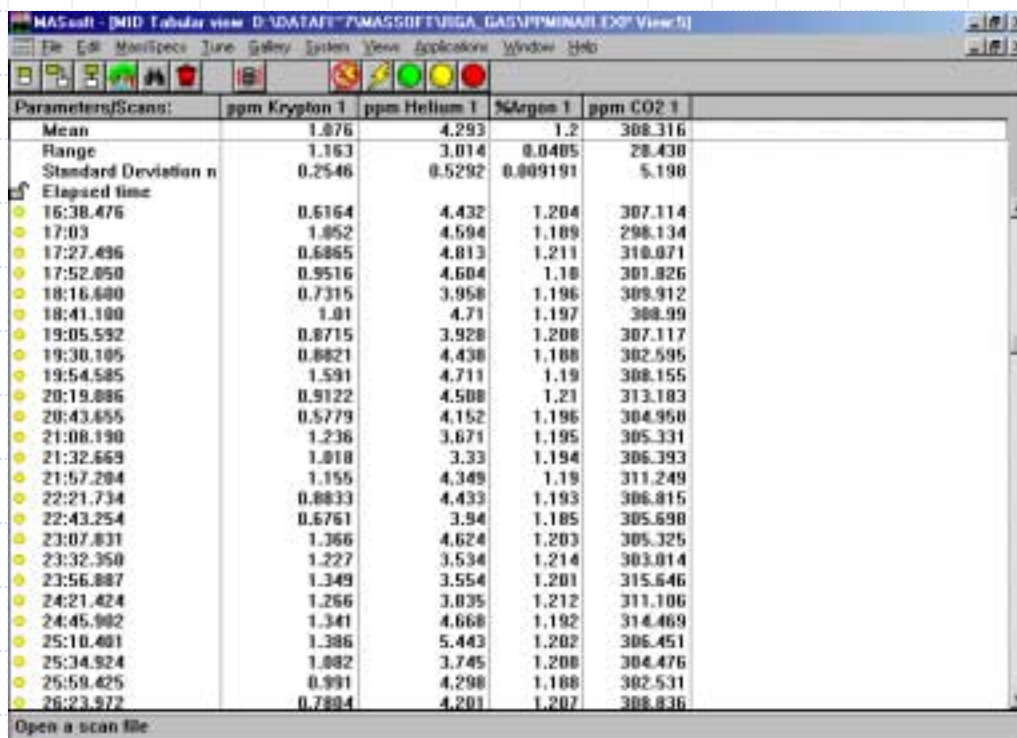•only 3 clicks of the mouse required to acquire mass spectra from MASsoft startup program.

software examples
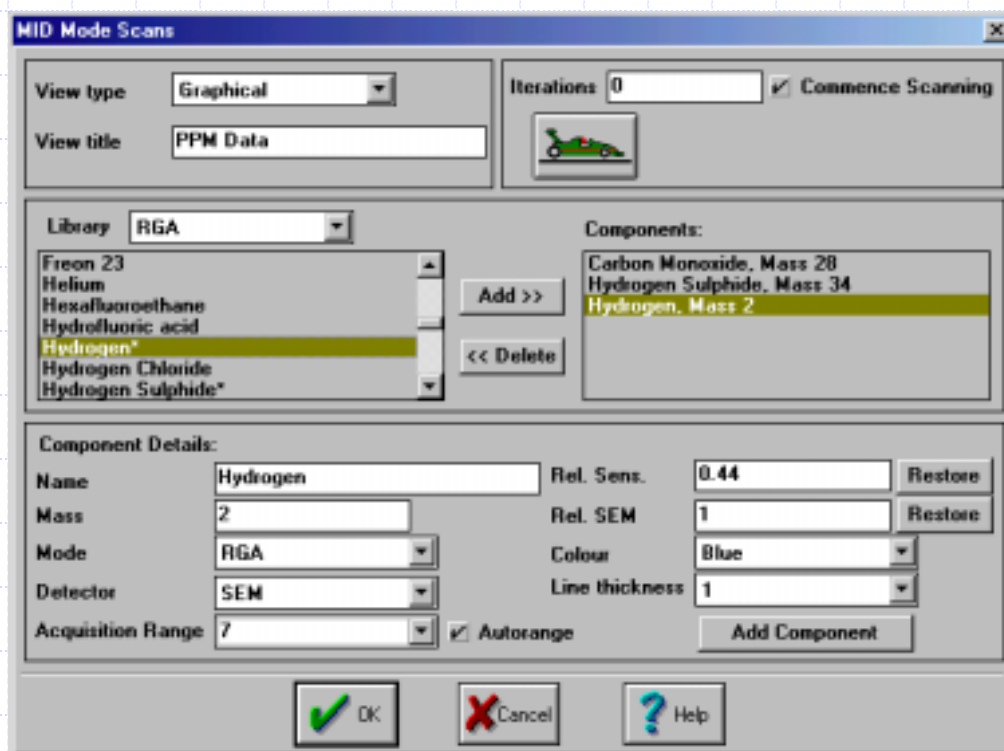
Multiple Ion Detection Mode

- Scan up to 100 different masses simultaneously.

- Choose masses from the internal library.

- View data as graphical views, tabular views or both at the same time.

- Display output in preferred units (i.e. partial pressure, %, ppb)
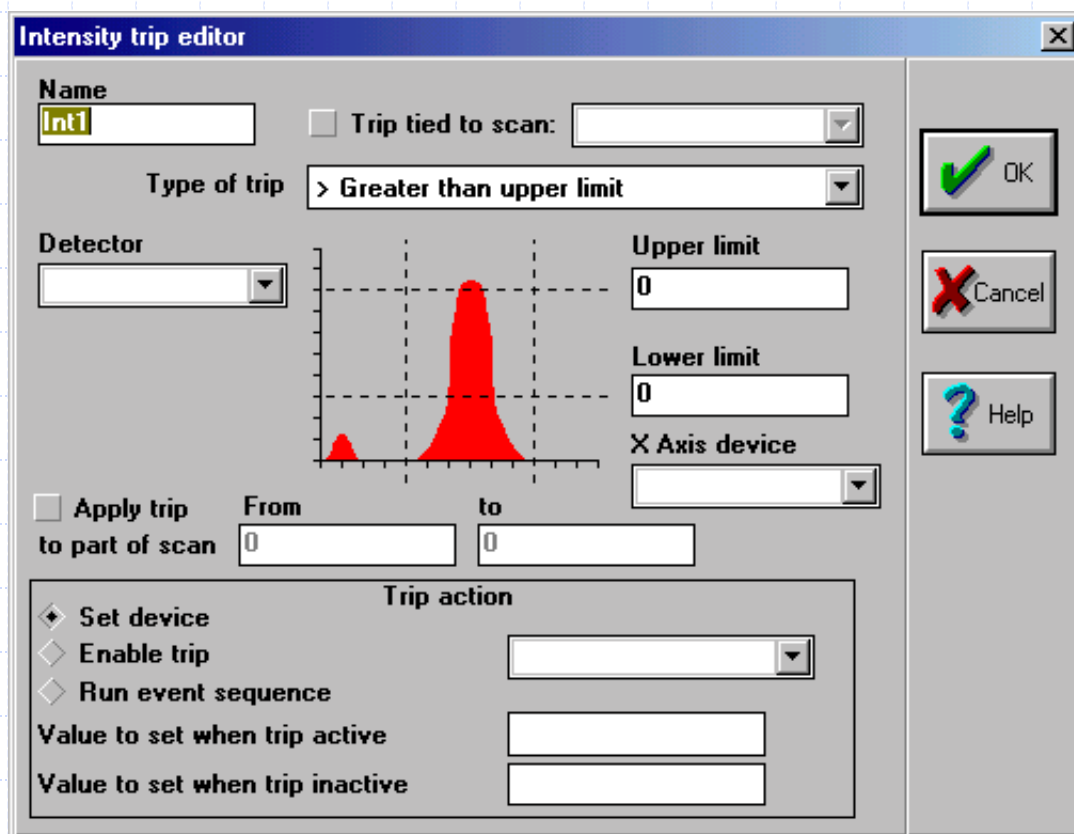
software examples

Tabular View

• results presented as a function of time in mixed units (ppm and %).

• the yellow markers indicate the range of data that has been selected for statistical analysis.

• Mean, Range and Standard Deviation from this analysis are shown at the top of the view and updated in real time.

software examples

I/O Events Editor

- powerful Events Editor allows trip, threshold and alarm levels to be set easily on screen. Output is to screen, audible beep or integral TTL and 0-10V analogue switches.

- used for 'out of limit' alarm indicators or sophisticated process control routines

www.HidenAnalytical.com

software examples

LabVIEW™ drivers

• the Hiden drivers are automatically self-configuring, with all mass spectrometer control parameters grouped within LabVIEW™ for convenient programming for the full application range .

why choose Hiden Analytical?

company profile

Hiden Analytical was founded in 1981 and is presently situated in a 23,000 sq. ft. manufacturing plant in Warrington, England with a staff of 65 persons.
Hiden Analytical Inc, a wholly-owned subsidiary of Hiden Analytical Ltd, was formed in New Hampshire on January 1st 1996 to establish a domestic USA sales/service centre.

NQA
ISO 9001
REGISTERED COMPANY

Certificate No. 6738

why choose Hiden Analytical?

people

◆ 65 staff providing...

◆ sales & service on 4 continents with ...

◆ 20 years manufacturing experience and...

◆ over 100 staff publications in peer reviewed journals

◆ over 200 user publications in peer reviewed journals

why choose Hiden Analytical?

Installations the following sites use Hiden Gas Analysis Systems

USA	UK/Europe	Asia Pacific
Applied Materials	Bosch	Canon
Axelis	IMEC	Hitachi Fundamental Res.
CVC/Veeco	Motorola	Hyundai
DuPont	Nortel Networks	LG Electronics
General Motors	Oxford Plasma Technology	NEC
IBM Research	Philips	Samsung
Lawrence Livermore	Rolls Royce	Sony Corporation
Motorola	SGS Thomson	TDK
NIST	Siemens	Tokyo Electron
Semetech	Surface Technology Systems	Toshiba

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