SMOKE PHOTO-**TOF**-MS

SMOKE ANALYZER

On-line analysis of toxic gases
in cigarette smoke

Product
Description +
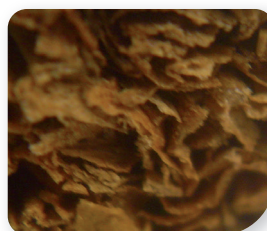
SMOKE-PHOTO-**TOF-MS**

SMOKE ANALYZER

The new system for chemical analysis of cigarette smoke

Photonion GmbH has developed a new on-line real-time measuring system for the chemical analysis of cigarette smoke. The Photonion Photo-TOF-MS smoke analyzer with a special vacuum ultra violet (VUV) lamp, was integrated to the smoking machine. The first smoking channel is connected to the Photo-TOF-MS analyzer for on-line analysis, while the second channel allows standard reference off-line analysis using a Cambridge filter pad or other sampling devices.

Functional Description ▼

Smoke from the cigarette filter holder is sampled continuously with the Photo-TOFMS mass spectrometry system at a flow rate of ~2mL/s. Various relevant species in the cigarette mainstream smoke are ionized by a special VUV-light source. After this unique soft photo ionization the formed ions are accelerated into the time-of-flight mass analyzer where they are separated due to their different mass to charge ratios. A typical mass spectrum of tobacco can be generated in ~10µs. A puff-resolved, on-line recording of the concentrations of several compounds thus is possible. Parameters for ISO as well as intense (Massachusetts, Canada) smoking conditions can be applied. Furthermore, „human smoking" profiles can be replicated by the smoking machine.

Technical Data and Specifications

Smoking Machine:

CONFIGURATION:

▶ 19"-module rack
▶ Two syringes
▶ Syringe controller
▶ Microprocessor controller
▶ Stepper motor controller

LENGHTS OF CIGARETTE SAMPLES:

▶ 60-120mm

DIAMETER OF CIGARETTE SAMPLES:

▶ 4.5 to 9 mm

TOTAL DIMENSIONS (WXDXH):

▶ 1130x800x1250 mm

POWER SUPPLY:

▶ 100-230V, 50/60Hz

PUFF VOLUME:

▶ 5-100 mL in 1s, 5-150mL in 2s

PUFF DURATION:

▶ 1 - 9.9 sec.

PUFF SHAPE:

▶ Programmable (ISO, Intense, human smoking profile replication)

INTERFACE:

▶ 1xRS232

Photo-TOF Smoke Analyzer:

SPECIAL INLET SYSTEM:

▶ Deactivated transfer line
▶ Whole smoke and gas phase measurements
▶ Special heated MS inlet needle
▶ Heated up to 250°C (Transfer line, Interface and Inlet)

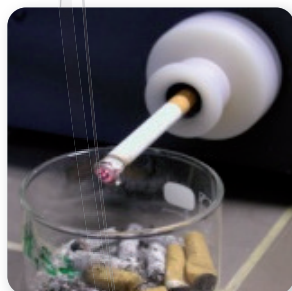### VUV-PHOTO IONIZATION LIGHT SOURCE:
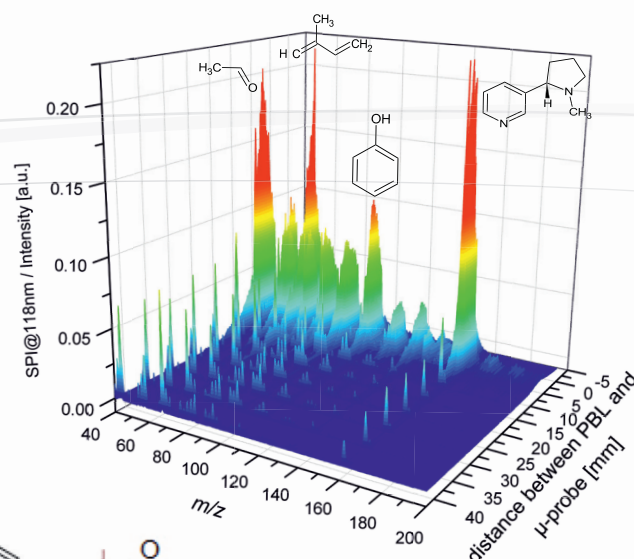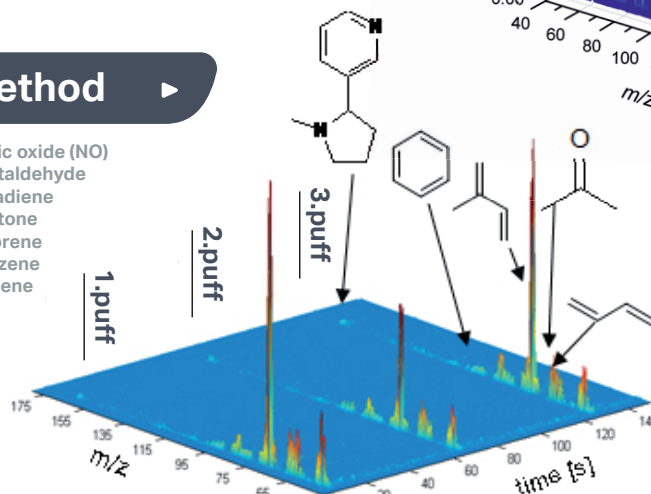
▶ High energy 10.78 eV

TOF-MASS ANALYZER:

▶ Mass range: 1 – 600 Th (m/z)
▶ Mass resolution: m/Δm = 700
▶ Dynamic range: 106
▶ Mass accuracy: 100 ppm
▶ Detection limit (Benzene): 100 ppb
▶ Maximal primary data acquisition rate: 100kHz
▶ Acquisition hardware: On-board mass spectra accumulation
▶ Soft SPI ionization mode (standard) and hard electron ionization mode (EI, 70 eV)

Quantitative puff-by-puff-resolved characterization of selected chemical species in the mainstream cigarette smoke:

Method ▶

Nitric oxide (NO)
Acetaldehyde
Butadiene
Acetone
Isoprene
Benzene
Toluene

Applications

Characterization of cigarette smoke

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