自動車排ガス用 リアルタイム同時多成分分析装置

RTM-MS

Real-Time Multi-component Mass Spectrometry for Vehicle Emission

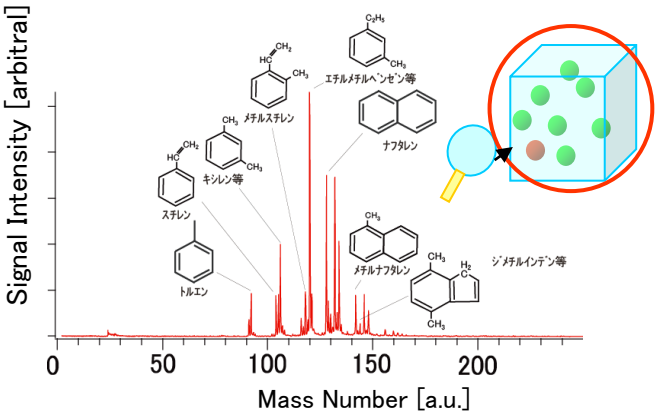
＊This product is based on accomplishment of Fundamental Research in the Field of Transportation, “A study of real-time assessment of harmful organic matter in vehicle exhaust gas with laser ionization portable mass spectrometry” supported by Japan Railway Construction, Transport and Technology Agency (JRTT).
(Project leader: Prof. Fujii (Tokyo Institute of Technology), Collaborator: National Traffic safety and Environment Laboratory, TOYAMA Co., Ltd.)

- ◆ Sensitive mass spectrometry for vehicle exhaust gas
- ◆ Easy to operate・Rapid analysis
- ◆ Suitable for measurement of Poly Aromatic Hydrocarbons

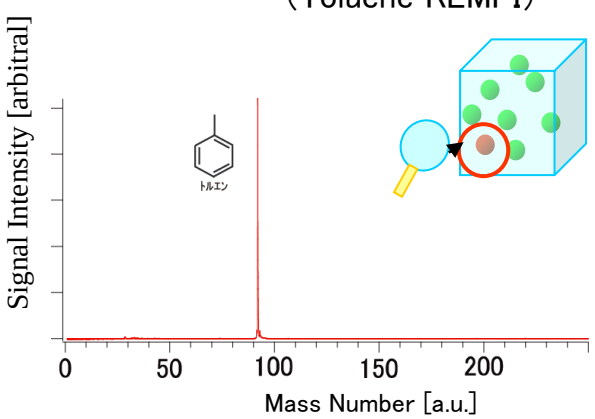
TOYAMA

Feature① <Multi-component simultaneous measurement and selected component measurement*>

Wavelength : 267.5002nm



Wavelength : 266.7613nm
(Toluene REMPI)



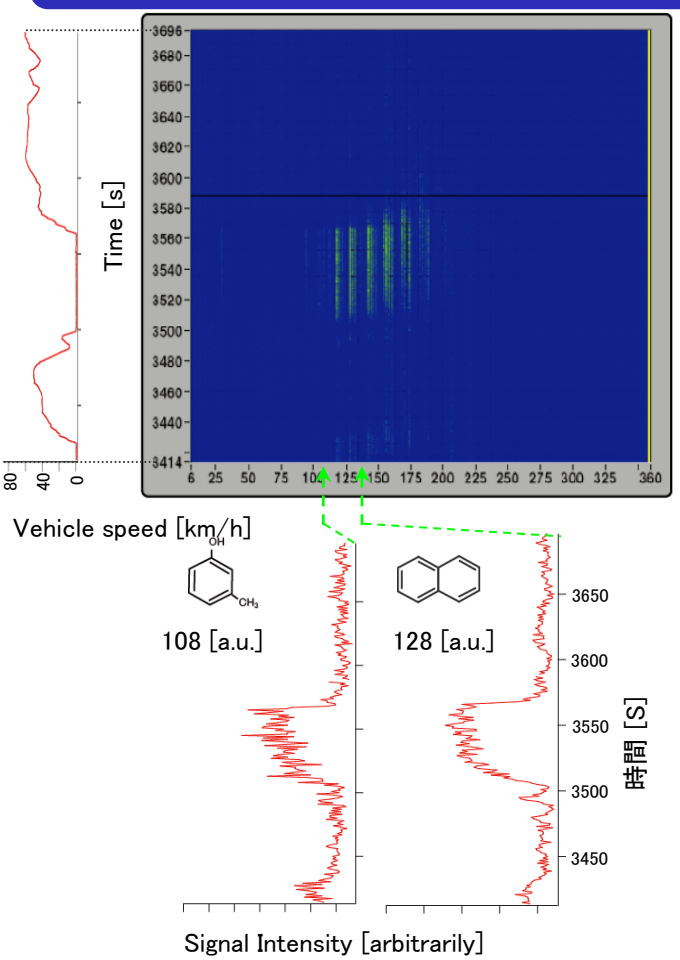
Rapid・Survey Analysis

Using a compact 266nm fixed wavelength laser, it is able to perform rapid and multi-component simultaneous measurement on various types of PAHs.

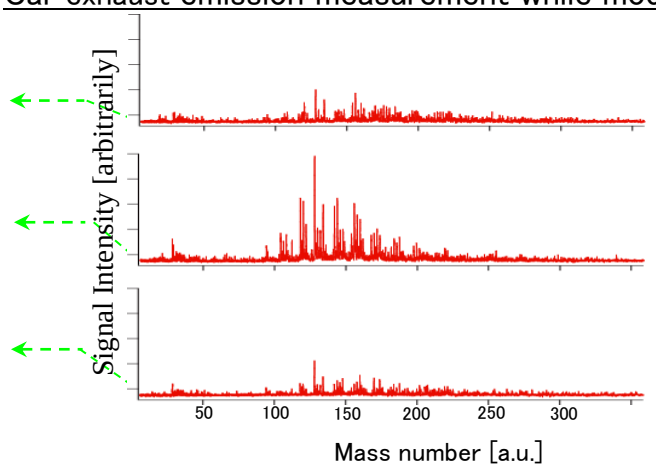
Sensitive・Quantitative Analysis

* Using tunable wavelength laser (Optional). With photo-ionization of molecule-specific resonant wavelength, it is able to detect only single selected component, or isomer with micro amount of discrimination and component concentration.

Feature② <Sensitive・Real-time measurement>

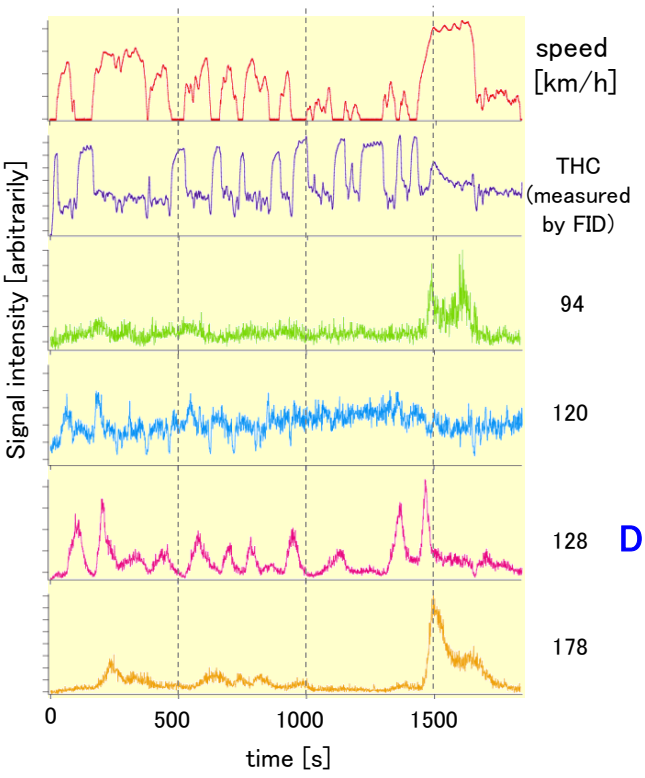


Car exhaust emission measurement while mode driving



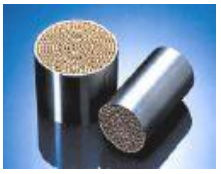
- Real-time measurement is possible without pre-processing of the sample.
- Less than tens of ppb of Concentration variation can be observed within a second.
- Original software makes it possible to undertake two dimensional analysis in signal intensity variation on time and mass number simultaneously.
- Using 1kHz laser, sensitiveness and high quality time response can be compatible.

Example① <Analysis of vehicle exhaust emission while driving>



- Sequential analysis of vehicle exhaust gas while mode driving is possible, because it doesn't require pre-processing unlike GC-MS.
- Sensitive, simultaneous multi-component and real-time analysis makes it possible to understand emission trend of varieties of components.
  It is possible to contribute to development of clean engine and catalyser.

Development of Engine



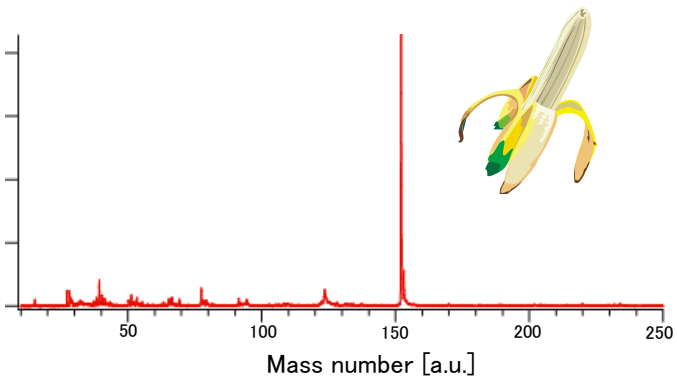
Development of catalyser

- Besides vehicles, it can be applied to such development of various products and environmental analysis.

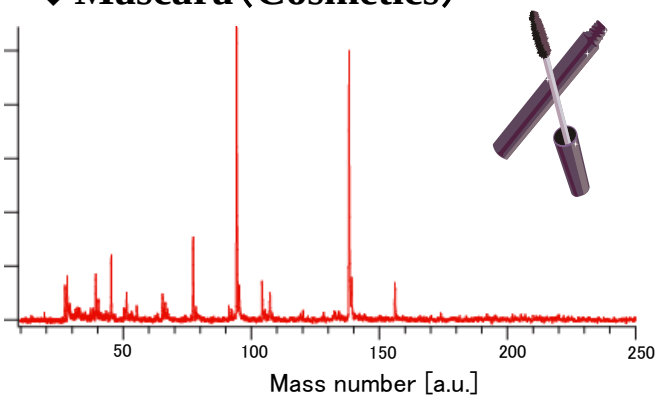
Example② <Analysis of gas components in various samples>

It shows great facility in analysis of various samples which includes smelling components and RoHS regulated components.

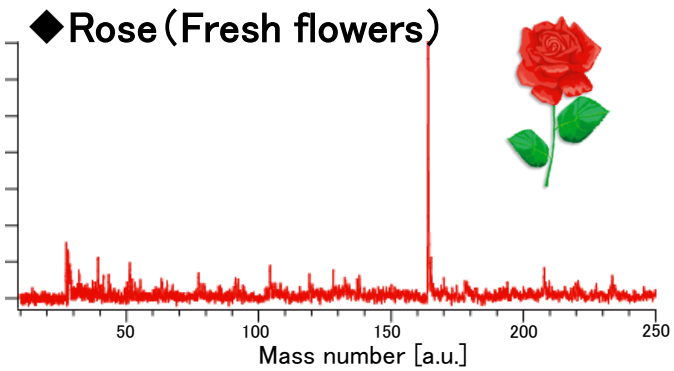
◆Banana (Fruits)



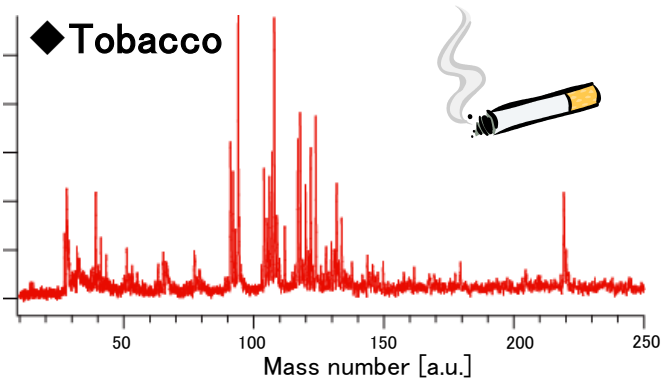
◆Mascara (Cosmetics)



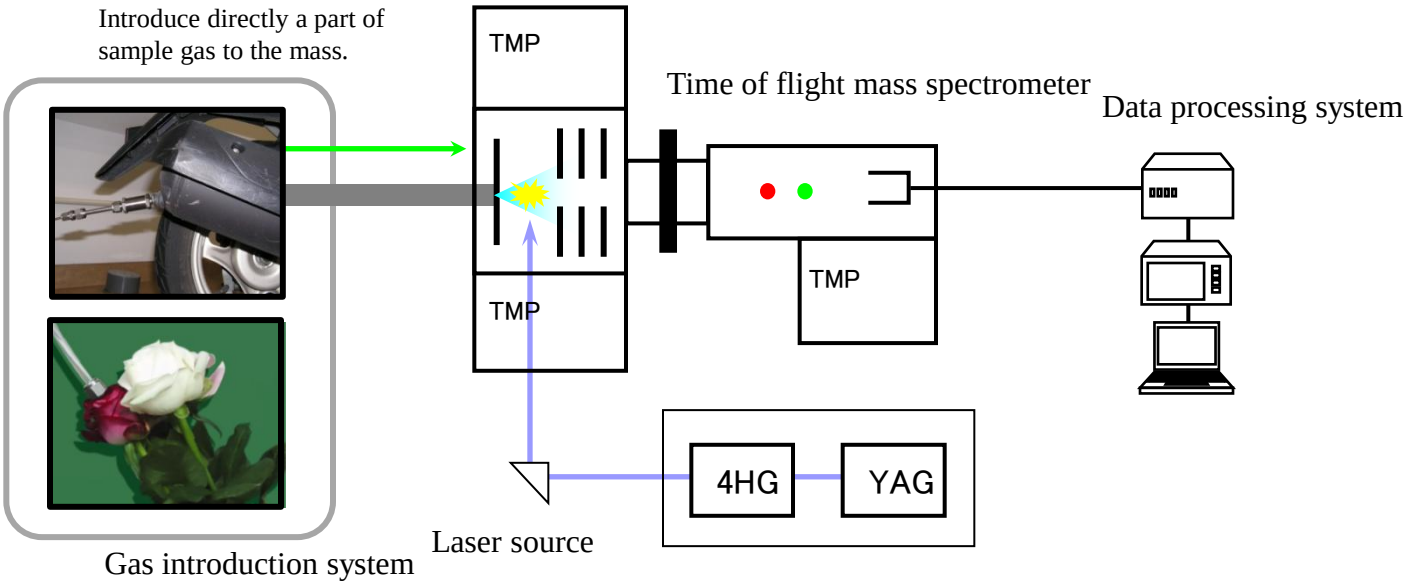
◆Rose (Fresh flowers)



◆Tobacco



Digest of <Laser Ionization Mass Spectrometer>



- Sample gas is multi-photon ionized by UV laser and detected by TOF-MS.
- It realizes measurement being 『sensitive・real-time・simultaneous multi component analysis』

① Using a UV laser makes it possible to do high efficient simultaneous multi component ionization.
② Using a TOF-MS, components of all the mass number can be detected simultaneously at real-time.

Specification and Composition

Analytical capability	Detection sensitivity (per sec, S/N=3)	Toluene: less than tens of ppb Naphthalene: less than 1ppb
	Mass resolution	400～(Half value width, m=120)
Composition of the system	TOF-Mass spectrometry system	Vacuum pump　Roughing:Rotary pump Main:1200ℓ/s×2, 800ℓ/s×1 and 50ℓ/s×1 Differential pumping accelerating electrode (Patent pending) Mass gate Daly detector
	Ionization system	Source Nd-YAG laser with 4HG crystal 266㎚ fixed wavelength Nd-YAG:100Hz、400μJ (4HG)
	Data processing system	Pre amplifier Oscilloscope PC Windows application (for measurement and analysis)
System Utility	Dimension	W1400×D800×H1400
	Weight	500kg　(Including laser source system)
	Electric consumption	2kW　(Maximum)
	Option	Dye laser system (for selective analysis)

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