



## EXPEC 5231 GC-MS/MS

Gas Chromatography-Triple Quadrupole Mass Spectrometer

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# EXPEC 5231 P GC-MS/MS

Gas Chromatography-Triple  
Quadrupole Mass Spectrometer

## Product Overview

EXPEC 5231 is a completely new gas chromatography-triple quadrupole mass spectrometer (GC-MS/MS) created by Hangzhou EXPEC Technology Co., Ltd, after many years investment. It has independent intellectual property rights by adopting a series of innovative mass spectrometry technologies. EXPEC 5231 GC-MS / MS adopts the gas chromatography/mass spectrometer interface without cold point in the whole process and the design of EI ion source to ensure efficient and stable sample transmission and ionization efficiency.

EXPEC 5231 GC-MS/MS has excellent anti-pollution ability and stability, outstanding scalability and best price value. It is suitable for the application of traditional Chinese medicine, agricultural residues, food safety, environmental monitoring and so on. Usage habits includes professional mass spectrometry control and quantitative analysis software, and combines with standard method library, intelligent batch processing and customized report output functions, which reduces the operation difficulty of mass spectrometry software system greatly. At the same time, it also has a rich application method library to meet the application needs of more mass spectrometry users.

## ABOUT US

Hangzhou EXPEC Technology Co., Ltd, founded in 2015 and headquartered in Hangzhou, Zhejiang Province, is a self-incubation subsidiary of Focused Photonics Inc. We are a national high-tech enterprise focusing on the R&D and industrial innovation and application of scientific instruments, and promoting the field use, automation and intelligence of analysis, detection and monitoring through technological innovation. We are committed to becoming the leading manufacturer of scientific instruments in the world and realizing the "Chinese dream" of scientific instruments.

We have the top technical experts and R&D team of more than 400 people. We have carried the accumulation of major scientific instrument R&D for 15 years, won the second prize of the national science and technology progress award, undertook dozens of key R&D plans of the national Ministry of science and technology and the formulation of national / industrial standards, mastered a relatively complete analytical and detection technology platform such as mass spectrometry, chromatography, spectroscopy and physicochemical analysis, as well as the injection pretreatment technology platform of gas, liquid and solid, and developed a series of technologically leading product combinations such as laboratory analysis, on-site analysis (portable, online and mobile), and automatic analysis. We provide comprehensive and specialized scientific analysis solutions for users all over the world in the fields of industrial analysis, environmental monitoring, life science, food and drug, safety emergency and so on.



# Product Features-Mass spectrometry system



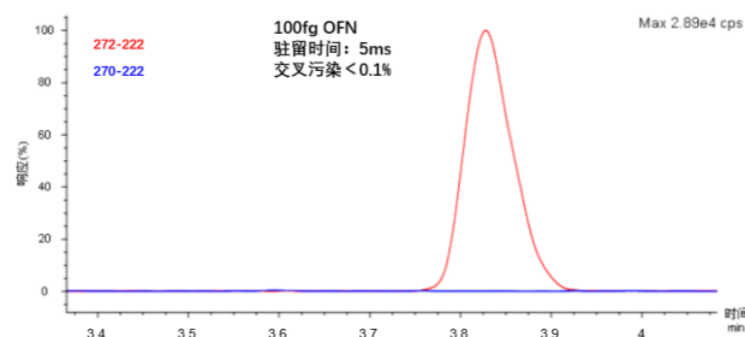
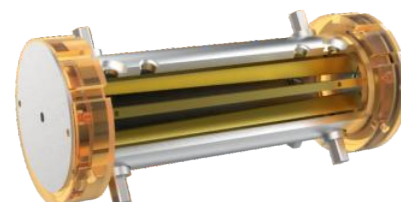
## Ion source

- Adopt the gas chromatography/mass spectrometer interface without cold point in the whole process and the design of EI ion source to ensure efficient sample transmission and ionization efficiency.



## Collision Cell with Axial Acceleration

- Improve scanning speed
- Improve collision efficiency
- Eliminate crosstalk between ion pairs and no memory effect.



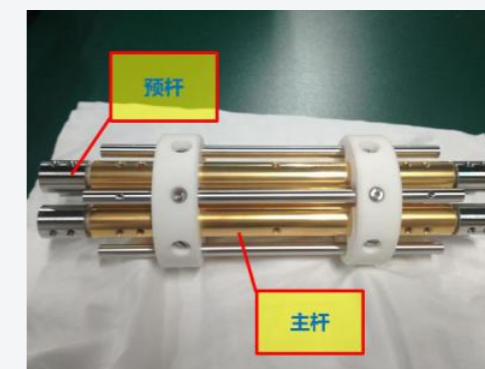
## Tandem QQQ quality analyzer

- Adopting design of tandem quadrupole mass spectrometers and six pole collision pool.
- The stable dual mass analyzer can carry out various mass analysis scans and is suitable for various mass spectrometry research work.
- Efficient collision pool for maximum ion transport.
- Including full scan, SIM, SRM, product ion scan, precursor ion scan, neutral loss scan and MRM.



## Pure molybdenum quadrupole Mass Spectrometers

- Pure molybdenum quadrupole has the best material stability to ensure the stability of the quality axis.
- Gold plating on the surface and inert treatment to eliminate organic deposition.



## Intelligent MRM

- The intelligent MRM function provides users with the convenience of method editing and modification.
- Be able to analyze more target compounds in a single run for more efficient use of instrument analysis time and increased sample throughput.

## Excellent sensitivity

- High ionization efficiency and ion transport efficiency.
- The innovative technology of axial acceleration collision pool improves the collision efficiency greatly
- The patented technology of pulse counting detection can detect ion signals without loss and filter noise interference effectively

## Excellent stability

- The patented closed-loop adaptive adjustment technology of dual-channel RF power supply improves the stability of quadrupole RF power supply
- The patented anti temperature and humidity alternating technology is suitable for a wider range of temperature and humidity applications

## Mass Expert mass spectrometry workstation

- Mass Expert mass spectrometry is easy to operate. The function of one-click automatic tuning and quality calibration reduces the complexity of instrument control and the threshold of instrument use. Mass spectrometry analysis software and report template can be customized according to different application fields and different users to meet the use needs of various application fields.

# Product Features-Gas Chromatography System



EXPEC 5231 GC-MS/MS is equipped with GC2000 gas chromatograph, which adopts advanced electronic flow control system, microfluidic plate control technology, high-precision independent temperature control system and high-sensitivity detector, with flexible and friendly user interface, high-speed sampling frequency and signal processing speed, meeting the user's requirements for instrument analysis capability, reliability, stability and advancement.

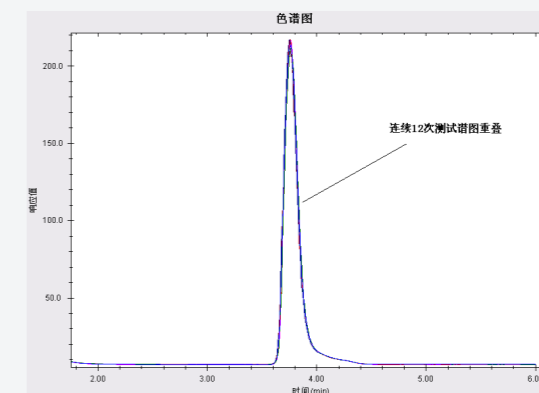
## Intelligent instrument control, which is simple and easy to use

- The host monitoring software is developed based on the intelligent system of the micro-kernel processing architecture. It is equipped with an 8-inch full-fit high-resolution capacitive touch screen and an image UI, combined with intelligent functions such as self-diagnosis reminder, self-detection of leakage, and self-saving of carrier gas, reducing the difficulty of use and maintenance, and easily grasp the status of the instrument.
- The system innovatively adopts a multi-core collaborative processing architecture, and task instructions are automatically allocated according to the current load of each micro-core, which greatly improves the response time, execution efficiency and stability of processing tasks, ensuring that the software still operates smoothly after long-term operation.
- The software follows the simple and easy-to-use design concept, retains the necessary system parameter monitoring and setting, and simplifies various unnecessary complex settings through intelligent one-key operation. At the same time, the simple and refreshing monitoring and parameter setting interface adopt a combination of quasi-materialization and flattening and modular design, and the interface is easy to learn.



## Excellent chromatographic stability

The whole flow path of the machine adopts a new generation of high-precision electronic pressure/flow control, with automatic atmospheric pressure and temperature compensation. The highest control accuracy can reach 0.01 kPa, with reliable inlet and column oven temperature control module, ensuring that the system has excellent analysis reproducibility. In addition, in some specific applications, the target analyte has a high boiling point and strong adsorption, and can be equipped with a fully inert pipeline to ensure the excellent reproducibility of the system.



## PTV solvent diversion inlet

- Support hot/cold diversion and diversion-less modes, as well as large volume injection (solvent diversion) and on-column injection (TPOC), with air cooling, the temperature range can be controlled from 5°C to 450°C, and with liquid nitrogen cooling, the lowest temperature can reach -100°C, liquid carbon dioxide can reach -50°C. Program temperature up to three gradients can be programmed, and the heating rate can reach 800°C/min.
- Large volume injection can be used to reduce the concentration process in pretreatment.
- Convenient cryogenic option for analytical applications at initial cryogenic conditions (cold on-column loading)
- The compact and low-melt design and efficient forced ventilation system increase sample throughput.

## Retention time lock

- Excellent GC analytical techniques require consistent retention times. With the new generation of high-precision electronic pressure/flow control, reliable column oven temperature control module and convenient analysis workstation, in the case of cutting and long-term use of chromatographic column efficiency changes, the retention time can be locked in one injection, reducing repetitive editing of MS methods by experimenters and easily obtain
- high-quality gas phase data.

Consistent retention times can be obtained on the same GC or GC-MS system, or even multiple GC and GC/MS systems.

## Post-column backflush technology

- The backflushing flow path is precisely controlled by auxiliary EPC, without dead volume.
- Reduce contamination by backflushing the matrix of high molecular weight compounds through split flow to avoid entering the detector; and reduce the accumulation of high boilers in the column.
- Faster cycle times, backflushing away high molecular weight compounds, reducing chromatographic run time and column temperature.
- Longer column life and reducing detector maintenance.
- Improve data quality and get better analytical results.

## Automatic sampler

- **Liquid injection**  
Whether standard injections, fast injections, sandwich injections or large volume injections of up to 1000 µl of liquid samples, GC2000 provide highly reliable and efficient operations, allowing you to easily have stable and reproducible analyses result and no cross-contamination or analyte discrimination. The maximum 110-position autosampler is optional, and there is no need for personnel to be on duty during high-throughput injection.
- **Headspace injection**  
The software's overlapping sample preparation function allows pre-processing such as preheating of multiple samples and analysis of GC to be carried out simultaneously to maximize the utilization of the equipment. The headspace needle is constantly heated and continuously cleaned by carrier gas purge during the process to prevent cross-contamination.
- **Solid Phase Microextraction (SPME)**  
All steps required for SPME analysis can be fully automated, including fiber tip aging, sample extraction, fiber tip analysis, and fiber tip replacement. Derivatization can be performed directly on the fiber tip or by adding derivatization reagents to the sample prior to extraction. The mechanical stress on the extraction head is greatly reduced, increasing its service life and increasing the uptime of the instrument.
- **Dynamic Headspace (Purge and Trap DHS)**  
Compared with static headspace, dynamic headspace greatly improves the detection limit, and retains the characteristics of good reproducibility and easy operation of static headspace. Solid sample viscous material and liquid sample headspace are blown away by inert gas, and volatile substances are transferred to replaceable adsorption wells for enrichment, and the entire process is automated GC/MS analysis.

## Applications

### Environmental monitoring

Monitoring and Analysis of Environmental Pollutants



### Food safety

Detection of food additives, food residues, contaminants, illegal additives

### Biomedicine

Detection of Chinese herbal medicines, synthetic APIs, proprietary Chinese medicines, and synthetic drugs

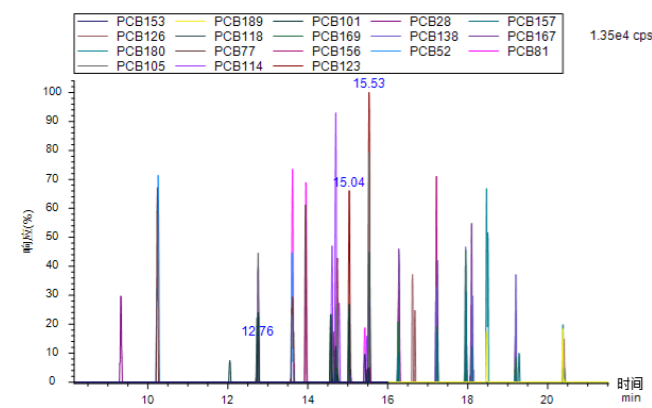


### Forensic and Toxicology

Detection of illegal drugs and poison

## Detection of polychlorinated biphenyls in water

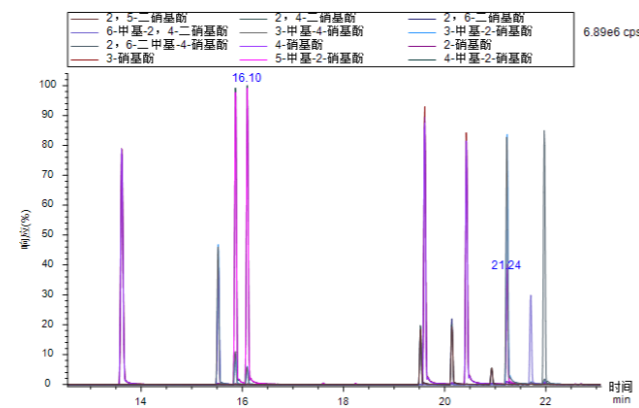
The GC-MSMS analysis scheme established on the basis of "HJ715-2014 Determination of Polychlorinated Biphenyls in Water Quality-Gas Chromatography-Mass Spectrometry" effectively reduces the signal-to-noise ratio and improves the sensitivity of target compounds.



Chromatograms of 18 polychlorinated biphenyls Analysis by GC-MS/MS

## Detection of nitrophenols in water

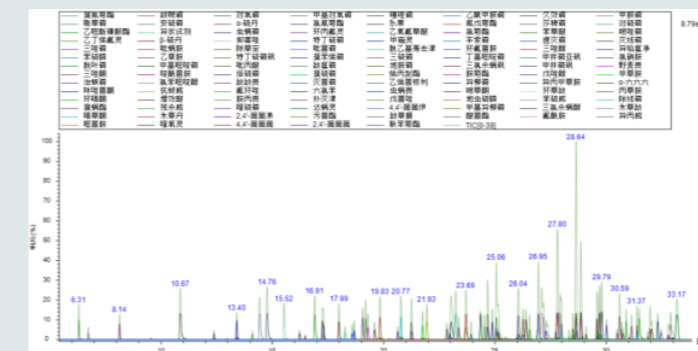
The analysis scheme established according to "HJ1150-2020 Determination of Nitrophenolic Compounds in Water Quality; Gas Chromatography-Mass Spectrometry" can provide a reference for the detection of nitrophenolic compounds in water quality.



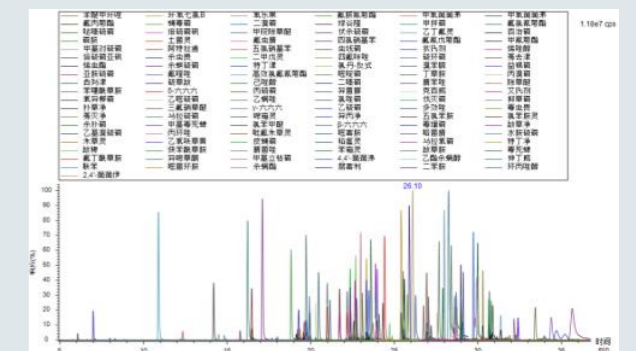
Chromatograms of 12 Nitrophenols Analysis by GC-MS/MS

## Detection of various pesticide residues in food

"GB23200.113-2018 Detection of Residues of 208 Pesticides and Their Metabolites in Plant-derived Foods by Gas Chromatography-Mass Spectrometry" is the first national standard in China to use GC-MS/MS for the detection of various pesticide residues. Compared with traditional GC or GC-MS methods, the detection throughput, selectivity and sensitivity of GC-MS/MS national standard are greatly improved (the limit of quantification for many pesticides is lower than 0.01mg/kg), and it will become a powerful assistant for pesticide residue analysis in the industry. Puyu Technology has a database containing thousands of compounds, and adopts intelligent MRM technology (MRM optimized for retention time) to help achieve high-throughput analysis of various pesticide residues in food.



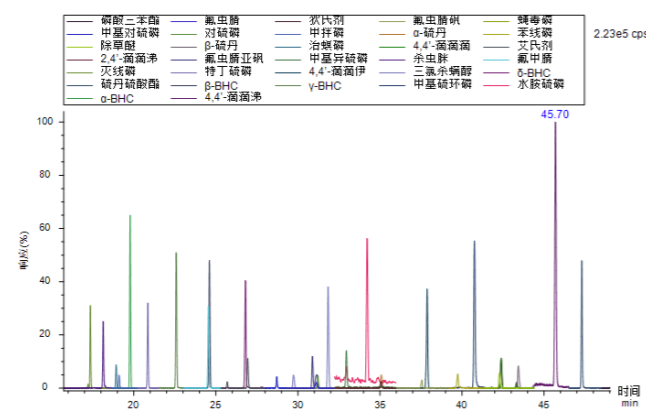
Chromatograms of 208 Pesticide Residues (A Group) Analysis by GC-MS/MS



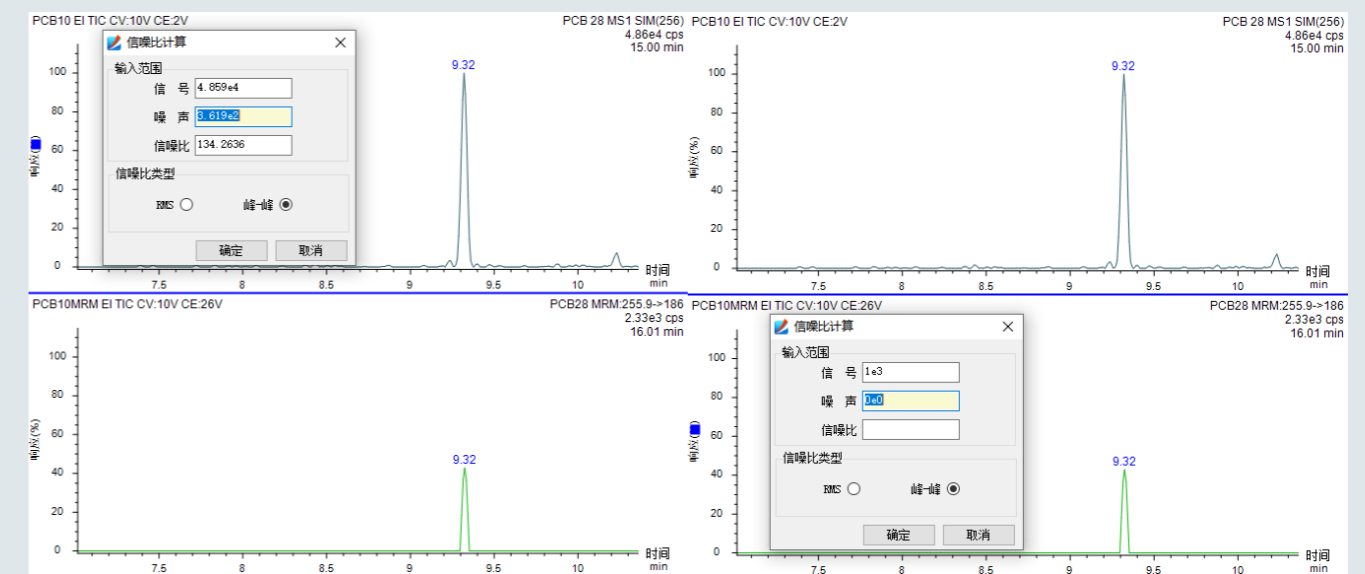
Chromatograms of 208 Pesticide Residues (B Group) Analysis by GC-MS/MS

## Detection of banned pesticide residues in Chinese herbal medicines

The sensitivity of the method meets the requirement of "undetectable" limit of quantification stipulated in the new pharmacopoeia. The established GC/MS analysis scheme can provide a reference for the detection of banned pesticide residues in Chinese medicinal materials.



Chromatograms of 33 Pesticide Residues Analysis by GC-MS/MS



Comparison of signal-to-noise ratio between MS1 and MRM scan modes