

LC-MSMS DW-EXPEC5210

Liquid Chromatograph - Triple Quadrupole Mass

Introduction

DW-EXPEC5210 Liquid chromatograph - triple quadrupole mass spectrometer, integrating the high separation efficiency of liquid chromatograph and the strong identification capability of mass spectrometer, has sufficient sensitivity and selectivity, good stability and strong anti-interference. Therefore, it is applicable to the qualitative and quantitative analysis on high sensitivity of trace pesticides and veterinary drugs in complex matrix.

Work Environment

1. Work environment temperature: 18-25 °C
2. Humidity in work environment: (20 ~ 60)% RH
3. Power supply: five sets of single-phase (220 ± 20) V AC, 10A, 50 Hz power supply

Features

Workstation software:

- 1. Basic features of software system: Windows XP or above operating system. The software can control the liquid chromatograph and mass spectrometer, with built-in data processing and report editing functions. Besides, the software can realize the function configuration and condition optimization of the instrument automatically, the automatic quantification, the mass spectrometry data analysis, and the establishment and retrieval of spectral database.
- 2. The system has the functions of automatic correction and instrument condition monitoring.
- 3. The LC-MS operation software can be installed on the personal computer, and used for the offline processing of sample analysis data and report generation.

Applications

1. Detection of sulfonamides in pork
2. Detection of carbamate pesticides in water
3. Detection of perfluorinated compounds in environmental media
4. Screening of neonatal genetic metabolic diseases
5. Determination of vitamin D in serum



Specifications

Configuration and performance indicators of liquid chromatograph

1. Ultra-high pressure gradient pump

Two solutions in A and B, or C and D, can be selected as the flowing phase of the system by switching the solvent selection valve.

A vacuum degasser is equipped, with each pump degassing separately (A/B).

Flow range	1-4,000 μ L/min
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Maximum pressure	\geq 18,850psi
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Accuracy of flow rate	\leq 1%
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Precision of flow rate	\leq 0.075% RSD
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2. Automatic sample injector

Three injection modes	full loop injection, partial loop injection and microliter pickup.
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Injection repeatability	Full loop injection <0.3% RSD; partial loop injection <0.3% RSD; microliter pickup <1.0% RSD
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Cross contamination	<0.05%
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Maximum sample capacity	384 bits, and 96 bits for standard liquid injection.
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3. Column oven

Temperature control range	Room temperature +5 $^{\circ}$ C - 90 $^{\circ}$ C
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Temperature control mode	preheating of flowing phase + forced air circulation
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Maximum column capacity	Six 250mm long chromatographic columns can be installed at the same time.
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Requirements for configuration and performance indicators of mass spectrometry system

1. Ion source (spray ion source for standard configuration)

Orthogonal vertical spray design is adopted, so that the system has strong anti-pollution capacity and low background noise.

Ion source gas supply

1 loop of nitrogen for atomizing and 2 loops of nitrogen for desolvation. Specifically, the flow rate of nitrogen for atomizing is 0-2 L/min, and that for desolvation is 0-15 L/min. The maximum spray voltage is 6kV. The flow rate, voltage and temperature can be set up and run under the software interface, to ensure the maximum ionization efficiency and resistance to matrix interference.

A special exhaust device is set in the ion source to prevent the backflow of gas in the closed ion source cavity, further to reduce the memory effect and pollution of the ion source, decrease the load of the mechanical pump, prolong the service time of the mechanical pump oil, maintain the test environment and ensure the health of the staff.

2. Vacuum interface and ion transmission system

High temperature blowback gas design	Nitrogen is used as the blowback gas, with a flow rate of 0-5L/min to further remove the solvent and reduce the introduction of neutral molecules.
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Heating design of vacuum interface	It can be heated to 110 $^{\circ}$ C at most to improve the anti-pollution capacity.
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Vacuum interface maintenance	simple cleaning and maintenance, without vacuum unloading. The whole process of daily maintenance and installation can be easily completed in a few minutes.
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Ion transmission system	4-stage differential vacuum design is adopted, and multiple quadrupole transmission is used for accurate focusing of ions.
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3. Mass analysis system

Mass analyzer	Triple quadrupole mass analyzer.
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Quadrupole	Made of high-precision pure Mo material, capable of ensuring the best mass axis stability.
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Collision cell	Axial acceleration design is adopted, capable of effectively eliminating the interference of ion pair and ensuring the high-throughput analysis capability. Nitrogen (with purity \geq 99.999%) is used as the collision gas and supplied in cylinder.
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Resolution	0.4-2 amu (adjustable)
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Mass stability	better than 0.1amu/24 hours.
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Scanning speed	\geq 20,000 amu/s
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Number of MRM channels	100 channels/s
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Mass range m/z	5 - 1,000amu.
Dynamic range	6 orders of magnitude.
Sensitivity	ESI+, MRM mode: 1pg reserpine, injected on the column, with S/N≥100000:1 ESI-, MRM mode: 1pg chloramphenicol, injected on the column, with S/N ≥ 100,000:1;
Scanning functions	Full scan, selected ion monitoring (SIM), product ion scan, precursor ion scan, neutral loss scan, multiple reaction monitoring (MRM), positive/negative ion switching scan, etc.
4. Detector	
Multiplier technology, without any positive and negative ion discrimination effect, which has long service life, capable of ensuring the long-term data stability.	
Pulse-counting detector, to ensure the data reproducibility of low limit of detection.	
Positive/negative polarity switching time	≤ 50ms
Vacuum system	composed of a mechanical pump and a turbo molecular pump, with a differential pumping system formed between the ion transmission area and mass analysis area, functioning for automatic power-off protection.

Accessory system

1. Computer system

Brand computer with mainstream configuration, 4GB memory, 1TB hard disk.

2. AC stabilized power supply

15KVA, input voltage of 140v-300v, output voltage of 220 V ± 1%.

3. Laser printer

6018L, black and white laser printer.

4. Nitrogen generator

The maximum flow is 24L/min and the maximum pressure is 116psi.

5. Mechanical pump

Pumping speed: 65m³/h, 220V power supply, 800W.