8000GC/MSD
Gas chromatography
Mass spectrometery

NWSpec MS Factory

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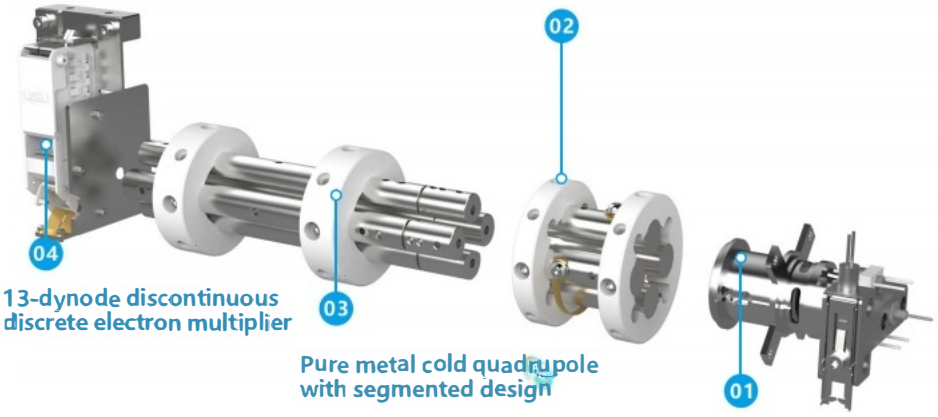
www.nwspec.com

CORPORATION

NW Spec is a leading high-tech enterprise in China engaged in the research and development, production, sales, and service of chemical analysis and medical detection mass spectrometer. We focus on providing users with fast, easy-to-use, and highly robust laboratory mass spectrometers and portable mass spectrometers for various application scenarios, and have accumulated advanced technologies at an international level and multiple core patents.

Existing products: LC-TQMS, GC-TQMS, GC-MS, and Portable GC-MS.



HARDWARE

NW Spec 8000 series products is a high-end GC-MS independently developed based on our own patented technology, with a detection limit of better than 10^{-14}g, which is at the top level of similar products in the world. It can be widely used in high demand fields such as scientific research, pesticide residue detection, environmental monitoring, and metabolomics research.

All metal conjugate quadrupole

The cold rod design does not require heating and lifelong maintenance. It adopts the most advanced segmented design, with detachable pre-quadrupoles that can automatically adjust DC voltage, eliminate edge field effects, prevent ion leakage, and thus achieve higher ion transmission efficiency.

Independent pre-quadrupole

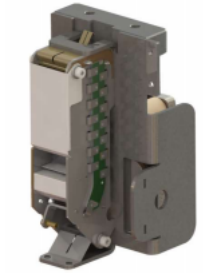
Applying RF voltage, combined with pre-quadrupole technology, effectively eliminates neutral fragment interference and reduces noise; Simultaneously optimize the ion source and quadrupole transition electric field.

High temperature inert ceramic ion source

Efficient ionization, reducing pollution, equipped with two long lifespan special material filaments, providing double usage time, and high-precision temperature control for all lenses. Easy to disassemble and clean.

Discontinuous discrete electron multiplier

Longer service life, stronger resistance to pollution and water.



Equipped with a dual-cavity ultra-high vacuum system as standard

To achieve a better vacuum environment, a dual-cavity vacuum chamber has been developed to enable individual exhaust for ion source and quadrupole part. A ultra-high vacuum environment has the following advantages:

A

Providing the whole MS system with a high vacuum level can not only reduce the contamination of the ion source, but also maintenance operation.

B

Fast turn-on enabled. Users can start their experiment within 30min after startup.

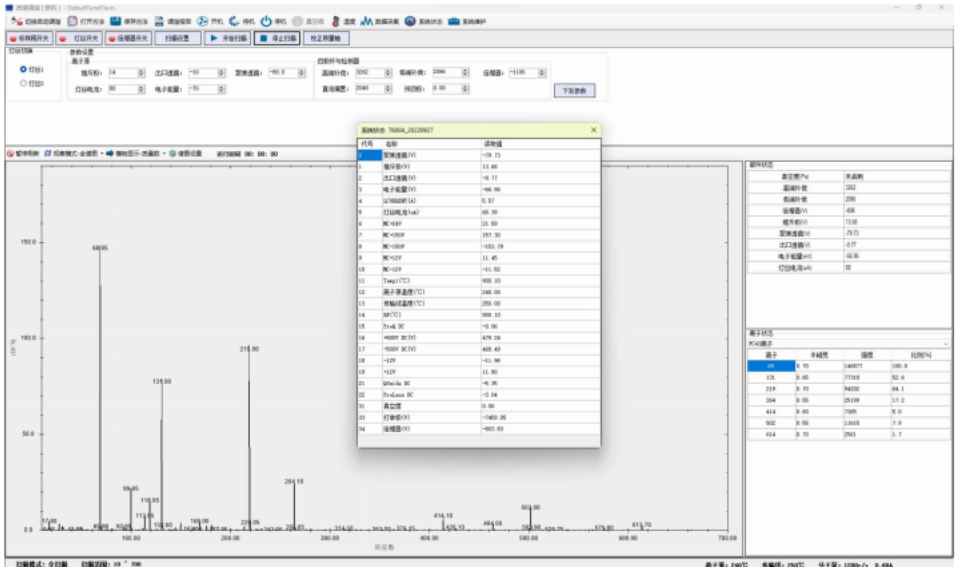
C

Maximum column flow supports up to 5mL/min (10mL/min available on flagship model). More advanced applications can be implemented by using lager-diameter GC columns.

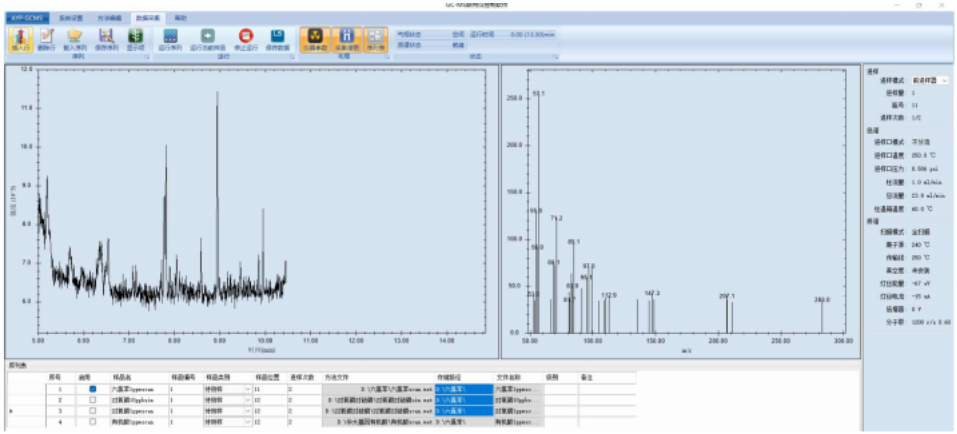
D

Electron multiplier in high vacuum status benefits ultra-high sensitivity test. GC direct injection, OFN method IDL is better than 10^{-14}g.

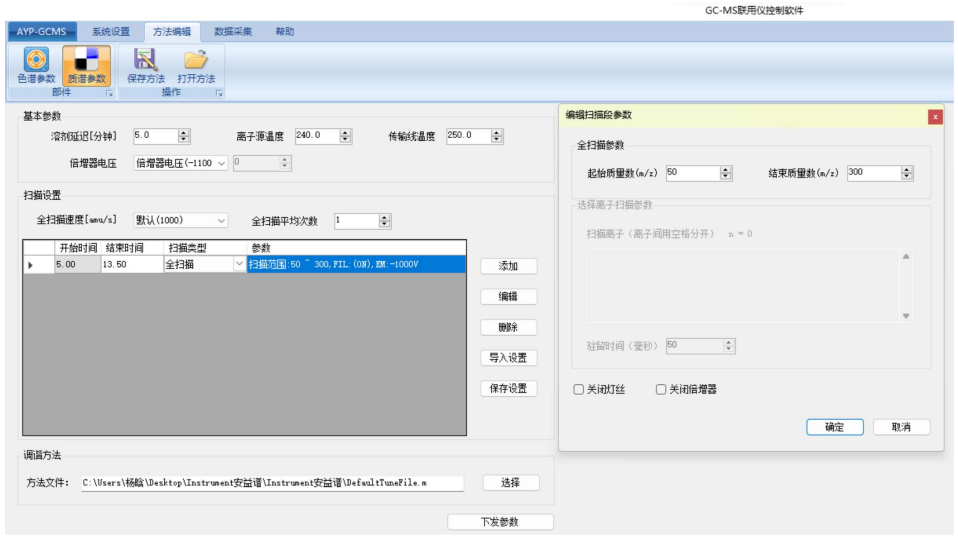
SOFTWARE features



Observe whether the mass spectrometry parameters are normal through manual tuning, and if there is no abnormality, there is no need to frequently perform automatic tuning and redo the calibration.

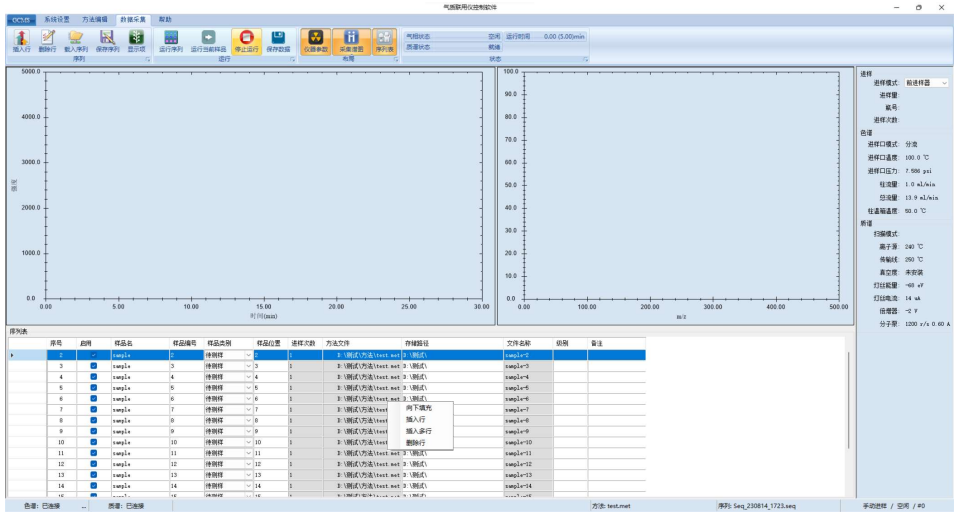


All instrument parameters are displayed in real time, and their status can be viewed at any time, and problems and faults can be accurately judged, and chromatographic flow monitoring can be carried out When the flow rate is abnormal, all heating zone temperatures are turned off to avoid column damage Real-time monitoring of molecular pump speed and current, abnormal prompt One-button automatic shutdown to avoid damage to the turbo pump

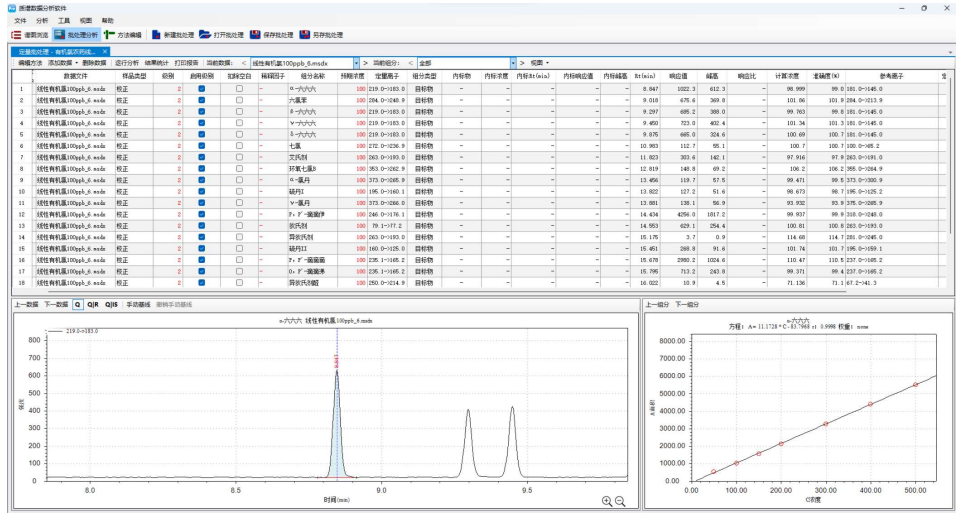


In the middle of operation, the time interval can be set to turn off the filament and the electron multiplier to protect the filament, and the electron multiplier can avoid the solvent or the peak in the middle time Other substances that are easily saturated

According to the data obtained from the full scan, the software can automatically select and group the characteristic ions of the target compound, and automatically set the ion residence time.Save to the analysis method without manual entry



The sample sequence can be edited easily and flexibly, and each row can be appended during the run, and each row can be selected by a different method, with the function of inserting multiple rows and auto-filling of columns



With the data batch processing function, the standard curve can be generated with one click, and the data can be processed in batches at the same time without adding them one by one

定性表 - 方法: -

	物质名称	CAS	保留时间	定量离子	参考离子	实际响应比%	参考响应比%	响应比偏差
1	特丁硫磷		16.464	231.0->128.9	231.0->174.9, 231.0->202.9	100.0, 71.6, 56.7	100.0, 71.6, 56.7	30, 30, 30
2	地虫硫磷		16.542	137.1->109.1	246.0->137.1, 246.0->109.1	100.0, 65.3, 91.1	100.0, 65.3, 91.1	30, 30, 30

Through the qualitative table function, the rapid qualitative of multi-substance and multi-data is realized

质谱数据分析软件

文件 分析 工具 视图 帮助

谱图浏览 批处理分析 方法编辑 新建批处理 打开批处理 保存批处理 另存批处理

定量批处理 - 有机氯农药统... 定量结果统计

	物质名称	序号	文件名	Rt	Rt平均值	Rt RSD[%]	响应值	响应平均值	响应值RSD[%]	含量	含量平均值	含量RSD[%]
1	α-六六六	1	重复性有机氯100ppb_6(1).ms4x	8.855	8.848	0.038	1063.28	1030.32	3.02	102.67	99.72	2.79
2		2	重复性有机氯100ppb_6(2).ms4x	8.848			1067.78			103.07		
3		3	重复性有机氯100ppb_6(3).ms4x	8.847			997.81			96.81		
4		4	重复性有机氯100ppb_6(4).ms4x	8.847			1040			100.58		
5		5	重复性有机氯100ppb_6(5).ms4x	8.848			1001.2			97.11		
6		6	重复性有机氯100ppb_6(6).ms4x	8.844			1011.85			98.06		
7	六氯苯	1	重复性有机氯100ppb_6(1).ms4x	9.025	9.018	0.042	749.48	726.05	2.64	113.17	109.58	2.68
8		2	重复性有机氯100ppb_6(2).ms4x	9.019			712.16			107.46		
9		3	重复性有机氯100ppb_6(3).ms4x	9.018			748.09			112.96		
10		4	重复性有机氯100ppb_6(4).ms4x	9.015			707.89			106.8		
11		5	重复性有机氯100ppb_6(5).ms4x	9.018			729.21			110.07		
12		6	重复性有机氯100ppb_6(6).ms4x	9.015			709.46			107.04		
13	β-六六六	1	重复性有机氯100ppb_6(1).ms4x	9.307	9.299	0.046	725.06	684.81	3.88	104.67	99.71	3.28
14		2	重复性有机氯100ppb_6(2).ms4x	9.297			703.5			102.01		
15		3	重复性有机氯100ppb_6(3).ms4x	9.297			659.7			96.62		
16		4	重复性有机氯100ppb_6(4).ms4x	9.297			662.17			96.93		
17		5	重复性有机氯100ppb_6(5).ms4x	9.297			692.54			100.67		
18		6	重复性有机氯100ppb_6(6).ms4x	9.297			665.91			97.39		
19	γ-六六六	1	重复性有机氯100ppb_6(1).ms4x	9.457	9.45	0.04	749	706.95	4.31	104.41	99.45	3.61
20		2	重复性有机氯100ppb_6(2).ms4x	9.447			694.49			97.99		
21		3	重复性有机氯100ppb_6(3).ms4x	9.45			693.23			97.84		
22		4	重复性有机氯100ppb_6(4).ms4x	9.447			737.92			103.11		
23		5	重复性有机氯100ppb_6(5).ms4x	9.451			696.74			98.49		
24		6	重复性有机氯100ppb_6(6).ms4x	9.451			668.3			94.9		
25	δ-六六六	1	重复性有机氯100ppb_6(1).ms4x	9.89	9.88	0.048	686.31	635.3	6.01	103.41	96.9	5.02
26		2	重复性有机氯100ppb_6(2).ms4x	9.876			663.54			100.5		
27		3	重复性有机氯100ppb_6(3).ms4x	9.879			615.93			94.43		
28		4	重复性有机氯100ppb_6(4).ms4x	9.879			654.53			99.35		
29		5	重复性有机氯100ppb_6(5).ms4x	9.879			597.17			92.04		
30		6	重复性有机氯100ppb_6(6).ms4x	9.879			594.31			91.67		
31	七氯	1	重复性有机氯100ppb_6(1).ms4x	10.993	10.987	0.031	151.06	129.74	9.41	120.45	109.46	5.74
32		2	重复性有机氯100ppb_6(2).ms4x	10.987			132.39			110.83		
33		3	重复性有机氯100ppb_6(3).ms4x	10.986			121.11			105.02		
34		4	重复性有机氯100ppb_6(4).ms4x	10.987			132.23			110.75		
35		5	重复性有机氯100ppb_6(5).ms4x	10.987			125.48			107.27		
36		6	重复性有机氯100ppb_6(6).ms4x	10.983			116.16			102.47		

It has the function of data aggregation and statistics

APPLICATION

examples

Environmental Testing

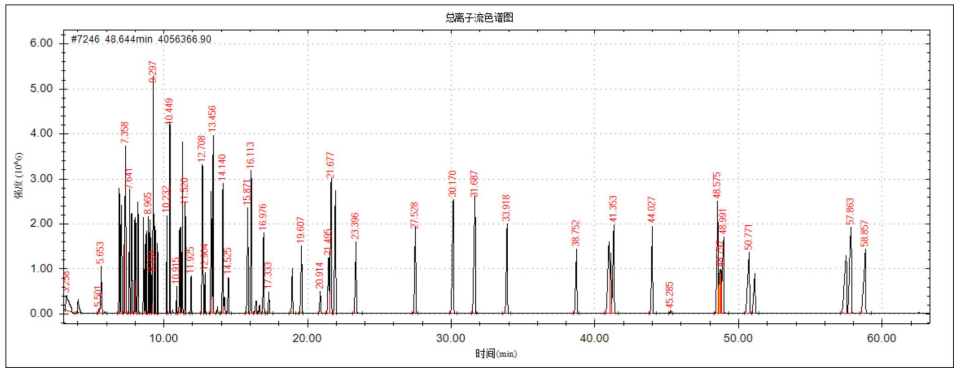
Soil and sediment Determination of semi-volatile organic compounds

Summary of methodology

Refer to HJ 834-2017 Determination of semi-volatile organic compounds in soil and sediment - Gas chromatography-mass spectrometry

Test Method

Injection Volume:	No shunts
Inlet:	1.0μL
Column(s):	280°C
Column Flow:	DB-5MS 30m×0.25mm×0.25μm constant current mode
Column box heating procedure:	1ml/min
Ion source:	35°C（2min）15°C/min 150°C（5min）3°C/min290°C（2min）
Transmission Lines:	280°C
Solvent Delay:	280°C
Scan Mode:	3min
SCAN Mode Scan Range:	Full Scan (SCAN) and Selective Ion (SIM)
	35~450amu



Total ion chromatogram

Ambient air Determination of volatile organic compounds

Summary of methodology

Refer to HJ 644-2013 Ambient air - Determination of volatile organic compounds - Adsorption tube sampling-thermal desorption/gas chromatography-mass spectrometry

Thermal desorption conditions

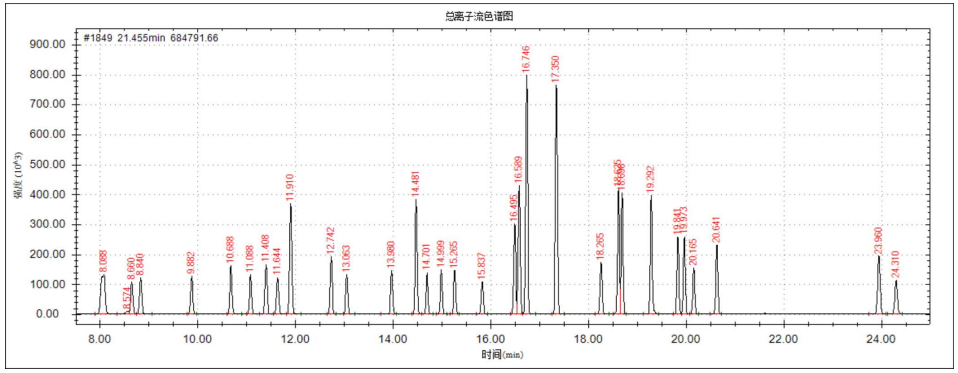
Temperature setting:	adsorption tube 300 °C; Transmission line 200°C; Injection valve 160°C; Cold trap -20 °C
Focus tube:	300°C； The aging temperature is 310°C
Time Setting:	Purging time 251s
Injection time:	200s
Aging time:	800s

Gas phase conditions

Injection Mode:	shunt
Shunt ratio:	10:1
Inlet:	220°C
Carrier gas:	Helium
Column(s):	DB-624 60 m× 0.25 mm× 1.4 μm constant current mode
Column Flow:	1ml/min
Column box heating procedure:	40°C（3 min）10°C/min 200°C（6 min）

Mass spectrometry conditions

Ion source:	240°C
Transmission Lines:	250°C
Solvent Delay:	7.5 min
Scan Mode:	Full Scan (SCAN) and Selective Ion (SIM)
SCAN Mode Scan Range:	35~300amu



Total ion current plot of volatile organic compounds

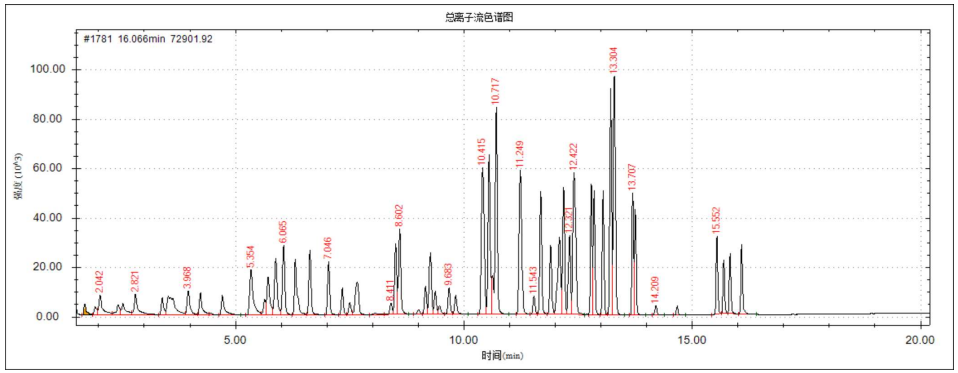
Determination of volatile organic compounds in water quality

Summary of methodology

Refer to HJ 639-2012 Determination of Volatile Organic Compounds in Water Quality Purging and Trapping/Gas Chromatography-Mass Spectrometry

Test Method

Purging time:	11min
Desorption temperature:	250°C
Desorption time:	1min
Injection Mode:	Split injection
Shunt ratio:	20:1
Inlet Temperature:	200°C
Column(s):	DB-624 30m×250μm×1.4μm constant current mode
Column Flow:	1ml/min
Column box heating procedure:	38°C（1.8min）10°C/min 120°C15°C/min240°C（5min）
Ion source:	300°C
Transmission Lines:	250°C
Solvent Delay:	1.5min
Scan Mode:	Full Scan (SCAN) or Selective Ion (SIM)
Scan Range:	35~270amu



20 μg/L standard solution selective ion chromatogram

Drinking water testing

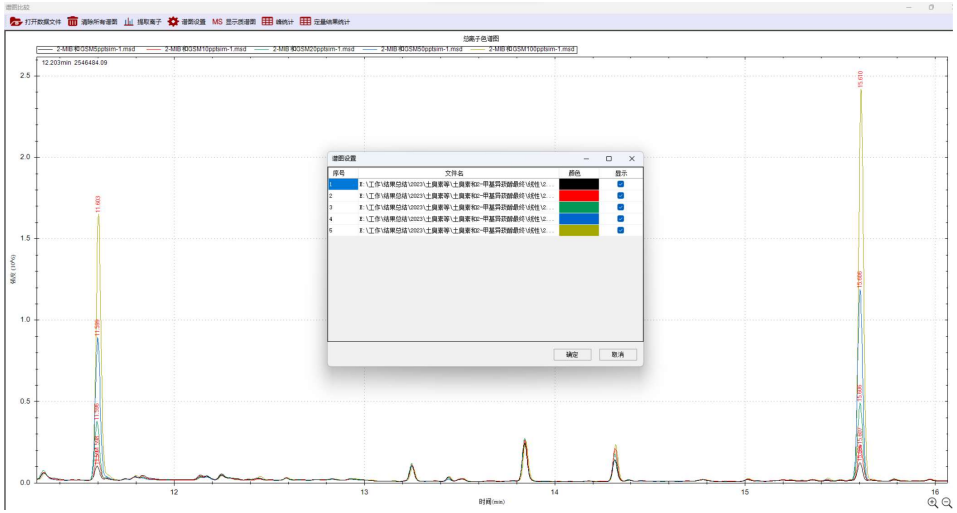
Determination of geosmin and 2-methylisoquinol in drinking water

Summary of methodology

The new sanitary standard for drinking water (GB5749-2022) has added two detection indicators of geosmin (GSM) and 2-methylisocamphenol (2-MIB).GB/T5750.8-2023 specifies the use of headspace solid-phase microextraction gas chromatography mass spectrometry for detection. In this report, the Anyipu 7700 GC/MS instrument is used. The method development of geosmin and 2-methylisoquinol in drinking water was carried out by headspace solid-phase microextraction gas chromatography-mass spectrometry, and the spirit of the instrument was evaluated Sensitivity, stability, accuracy.

Mass spectrometry instrument conditions

Inlet Temperature:	250℃
Injection Method:	No shunts
Carrier gas:	helium
Flow rate:	1.00ml/min
Program Heating:	Keep at 60℃ for 2.5min, raise the temperature at 8℃/min to 250℃ for 5min
Ion source temperature:	250℃
Transmission Line Temperature:	280℃
Scan Mode:	Choosing an Ion Scan (SIM)
2-Methylisocamphenol characteristic ions:	95 (quantitative), 107 (qualitative 1), 135 (qualitative 2)
	Geosmin characteristic ions 112 (quantitative), 125 (qualitative)



New energy detection

Determination of common carbonate solvents and additives in lithium battery electrolytes

Summary of methodology

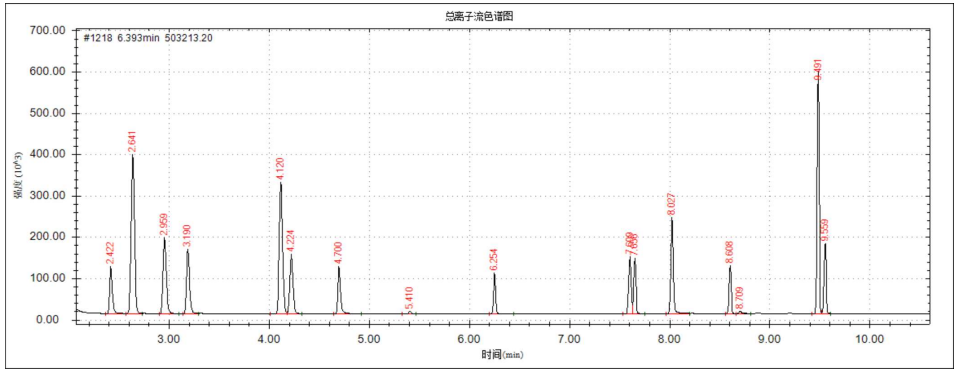
We established a method for the determination of common carbonate solvents and related additives in lithium battery electrolytes by ANYIPU 7700 gas chromatography-mass spectrometer. Optimized,The temperature of the inlet, the heating procedure, the temperature of the ion source and other conditions finally determined the determination meth Signatures were qualitative, and external standards were quantified. The linear relationship between the target compounds in t The repeatability of the linear minimum concentration point of 10 mg/L continuous injections, and the relative standard deviatio The present is better. The instrumental limit of detection (IDL) of the target compounds was less than 1.4 mg/L.

Gas phase conditions

Injection Mode:	shunt
Shunt ratio:	20：1
Inlet Temperature:	280℃
Column(s):	DB-17MS 30m×0.25mm×0.25μm constant current mode
Column Flow:	1ml/min
Column box heating procedure:	40℃（1min）10℃/min 75℃（0min）
	30℃/min150℃（1min）30℃/min250℃（2min）

Mass spectrometry conditions

Ion source:	280℃
Transmission Lines:	280℃
Solvent Delay:	2min
Scan Mode:	Full Scan (SCAN)
Scan Range:	35~450amu
Sweep Speed:	2000amu/s



Total ion current plot of 14 target compounds mixed with standard solution at 250 mg/L (Scan).

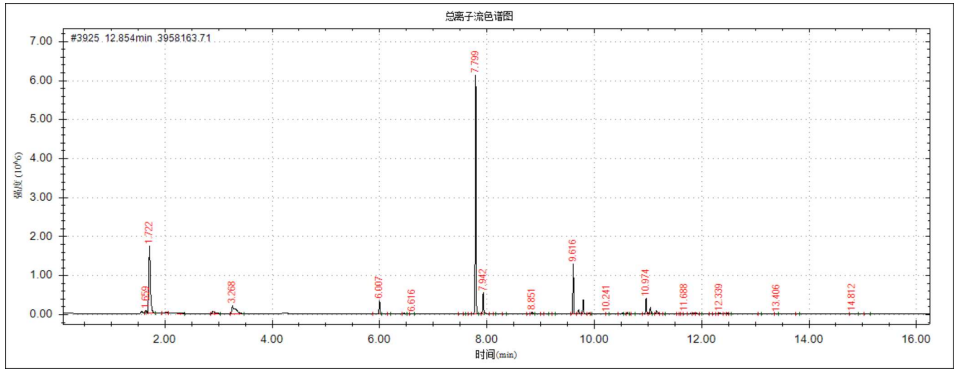
Analysis of orthosilicate components

Methyl orthosilicate sample method

Columns	DB-5MS 30m×0.25mm×0.25μm
Heating procedure:	45℃（1min）20℃/min 250℃（5min）
Inlet Mode:	shunt
Shunt ratio:	10：1
Inlet Temperature:	250℃
Column Flow Rate:	1.0ml/min (constant flow)
Injection Volume:	1μl
Ion source temperature:	240℃
Transmission Lines:	250℃
Solvent Delay:	0.1min
Scan Mode:	Scan
Time Segmentation:	0.1~2.5min 15~400amu, 2.5~3.8min off multiplier, Filament, 3.8~16.25min, 35~400amu

Ethyl orthosilicate sample method

Time Segmentation:	0.1~4.3min 15~400amu, 4.3~5.9min off multiplier, Filament, 5.9~16.25min, 35~400amu, Other gas chromatography mass spectrometry conditions are the same as methyl orthosilicate methods



Total ion current plot of the sample impurities

Food testing

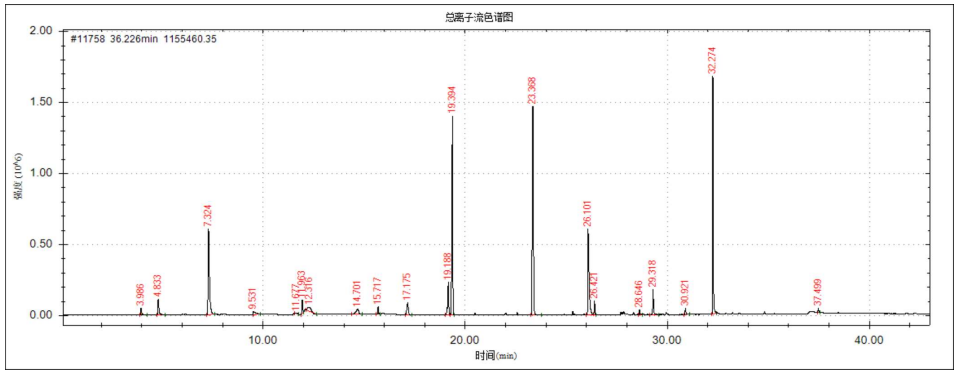
Liquor composition analysis

Gas phase conditions

Injection Method:	Direct injection
Injection Volume:	1μl
Inlet Mode:	shunt
Shunt ratio:	10：1
Inlet Temperature:	250℃
Column Flow Rate:	1.0ml/min (constant flow)
Column(s):	DM-WAX 60m×0.25mm×0.25μm
Column box heating procedure:	37℃（2min）3℃/min 70℃（1min） 6℃/min 130℃（0min）10℃/min 220℃（10min）

Mass spectrometry conditions

Ion source temperature:	240℃
Transmission Lines:	240℃
Solvent Delay:	0.1min
Filament off time:	8.3min~9.5min
Scan Mode:	Scan
Scan Range:	25~200amu
Ionization Energy:	70ev
Filament Current:	100μA
EM Voltage:	900V



Liquor total ion current (TIC) diagram

Chemical product testing

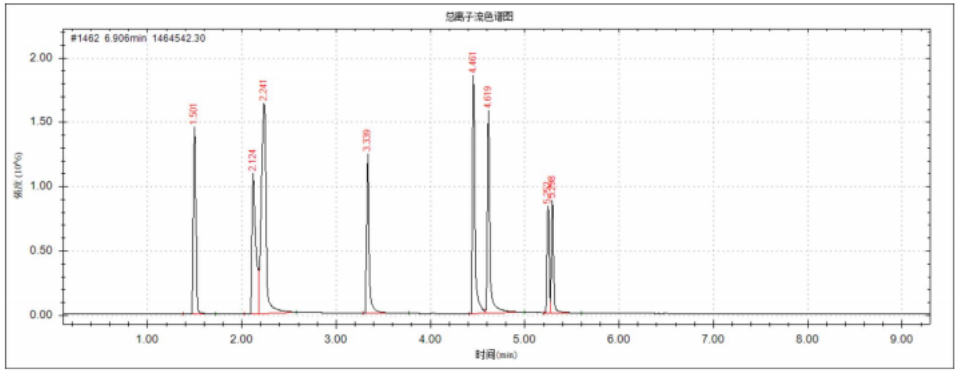
Determination of qualitative amines

Summary of methodology

The GCMS8000 gas chromatography-mass spectrometer was used to characterize the given samples, The qualitative method of the sample was finalized. In the Scan scanning method, the mass-spectra obtained by The components are: methanol (CAS number 67-56-1), ethylenediamine (CAS number 107-15-3), ethanolamine 10-85-0), diethylenetriamine (CAS 111-40-0), hydroxyethylethylenediamine (CAS 111-41-1), N-aminoethylpiperazine -31-8) and hydroxyethylpiperazine (CAS number: 103-76-4)

Test Method

Injection Mode:	shunt
Shunt ratio:	200：1
Inlet Temperature:	280℃
Injection volume	0.2μL
Column(s):	DB-17MS 30m×0.25mm×0.25μm constant current mode
Column Flow:	1ml/min
Column box heating procedure:	60℃（1min）30℃/min 250℃（2min）
Ion source:	240℃
Transmission Lines:	280℃
Solvent Delay:	0.1min
Scan Mode:	Full Scan (SCAN)
Scan Range:	30~300amu



Total ion current plot of amine sample full sweep (Scan).

Electrical and electronic product testing

Determination of 4 phthalates

Summary of methodology

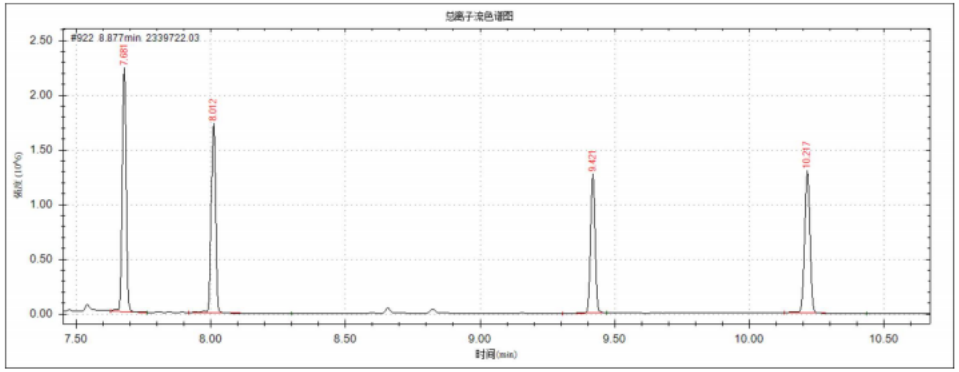
Refer to GB/T 29786-2013 Determination of dimethyl phthalate in electrical and electronic products - Gas chromatography mass spectrometry

Chromatographic parameters

Injection Mode:	No shunts
Purging time:	1.0min
Purge Flow:	50ml/min
Injection Volume:	1.0μL
Inlet Temperature:	280℃
Column(s):	HP-5MS 30m× 0.25mm×0.25μm constant current mode
Column Flow:	1ml/min
Column box heating procedure:	60℃（1min）30℃/min 280℃（6min）

Mass spectrometry parameters

Ion source:	300℃
Transmission Lines:	290℃
Ionization Energy:	70eV
Filament Current:	200μA
EM voltage:	990V
Solvent delay	6min
Scan Mode:	Full Scan (SCAN) and Selective Ion (SIM)
SCAN Mode Scan Range:	45~300amu



Concentration 5.0 μg/ml 4 phthalates full sweep total ion current plot

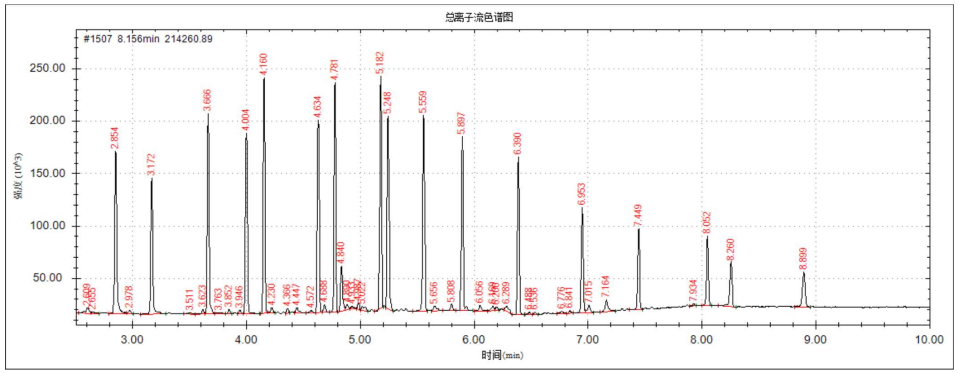
Polybrominated biphenyls and polybrominated diphenyl ethers GCMS schemes

Summary of methodology

Refer to GB/T 26125-2011 Determination of six restricted substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers) in electrical and electronic products

Test Method

Injection Mode:	Pulsed splitless injection
Pulse Pressure:	20psi
Pulse time:	0.75min
Purge flow	60ml/min
Purging time:	1min
Injection Volume:	1μL
Column(s):	DB-5HT，15m×0.25mm×0.1μm
Column Flow:	3ml/min
Inlet:	280°C
Ion source:	350°C
Transmission Lines:	340°C
Solvent Delay:	2.5min
Multiplier voltage:	Tuning voltage +0.2KV
Scan Mode:	Full Scan (SCAN) or Selective Ion (SIM)
Scan Range:	100~1000amu



Chromatograms of 17 PBBs and PBDEs mixed with standard 5 mg/L

CUSTOMER case

Peking university

A Center for Disease Control in Guangdong

A large third party in Guangxi

Nanjing Agricultural University

A environmental monitoring station in Inner Mongolia

An agricultural product inspection center in Qingdao

Zhejiang Electronic Technology Co., Ltd

Zhejiang Research Institute of Chemical Industry