

Ex²-Chrom Gas chromatograph



MAKING
Expanded&Excellent

GC9790 Plus

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PERFECT&BEYOND



Witness a new generation

GC97 series gas chromatograph , with more than ten years of technology accumulation and user authentication;

has achieved a total sales of more than 10000;

now entirely upgrade to 'Plus' .

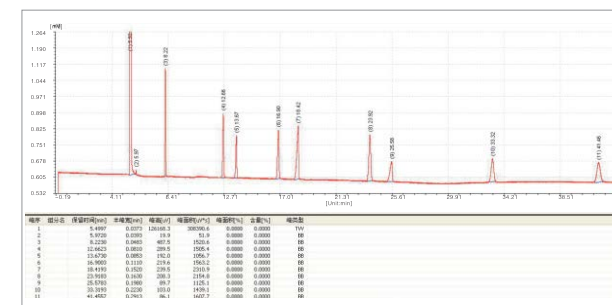
Ex²– Chrom wide development platform design
Meet users' testing demand in the varying fields

Expanded 1 Remarkable gas circuit control technology, improved separation and analysis ability

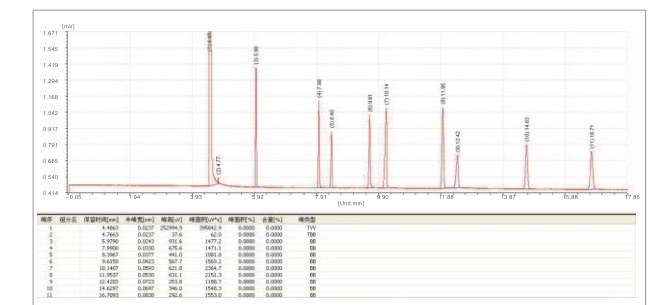
1 AFC (Accurate Flow Control) technology , guarantees excellent separation and analysis results

- With AFC control module, gas chromatograph has split/splitless mode. carrier gas can fulfill constant-pressure, constant-flow, constant-speed, programmable-temperature-rise, programmable-flow-rise and programmable-speed-rise to reduce sample decomposition and discrimination, while increase separation and shorten analysis time.
- EPC/AFC can fulfill digitalization and automatization, only need to input column parameters, EPC/AFC can set the best flow rate of column and show on the screen.
- EPC/AFC can fulfill gas leaking self-diagnosis and cut off low&gas source and alarm at the same time.

Example: One sample needs 43 minutes to finish the analysis using traditional method. After using the GC9720 programmable pressure-rise analysis ,it only needs 17minutes, with other analysis condition unchanged. And height of peak doubles, half-peak width reduces by a half, S/N increases two times, which optimizes analysis results efficiently.



Traditional GC (Column temp 140 °C)



Programmable-pressure-rise (Column temp 140 °C)

2 AFS(Advanced Flow Scout) technology, guarantees efficiency promotion

- AFS technology developed by Fuli, can real-time monitor flow&pressure of auxiliary gas circuit, with high precision and easy to use.



Pres:128.9 Total:52.2 Heat:Constant Mk-flux:30.0 H2-flux:30.0 Temp:50.00 Real:50.00 Sts:Stop
Flux:2 Purge:3.0 Temp:160.00 Air-flux:300.0
Temp:200.00 Real:200.00 Real:160.00 Temp:220.00 Real:220.00

Expanded 2 Multifunction injection

Dual-gas-circuit system, can support two kinds of injection, including packed inlet and split/splitless capillary inlet.

Packed injection

Controlled by AFC, support packed column (stainless steel, teflon, glass) with specification of $\phi 2, \phi 3, \phi 4$, etc..

Capillary injection

Controlled by AFC, support capillary column with specification of 0.20mm, 0.25mm, 0.32mm, 0.53mm. Anti-clogging and fast cooling design make analysis of high boiling point samples more efficient.

Expanded 3 Multi-detector with high sensitivity

Support up to three of detectors installed at the same time, including FID, TCD, FPD, ECD, NPD and so on, which fulfill diverse function in one instrument.

FID

High sensitivity, can detect various kinds of organic matter. The design of anti-trailing can improve the separation performance. Automatic ignition makes the operation simpler.

TCD

High sensitivity, universal detector that responds to all compounds. The combination with small size capillary columns(0.25mm and 0.32mm), can effectively improve separation and detection performance.

FPD

High sensitivity, used to analyze sulfide and phosphorus compounds of ppm level. Prevention of ponding and fire suppression, makes detector more stable.

ECD

High sensitivity and long lifetime, used to analyze electronegativity compounds of ppb level, like organochlorine pesticide residues and chloride in the water.

NPD

High sensitivity, widely used to analyze nitrogen compounds and phosphorous compounds of low concentration.

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Expanded 4 A variety of sampling techniques, to cope with complicated sample analysis

1 Using FL1090 autosampler, realizes high automation, enhances repeatability and precision of data, improves analysis efficiency.

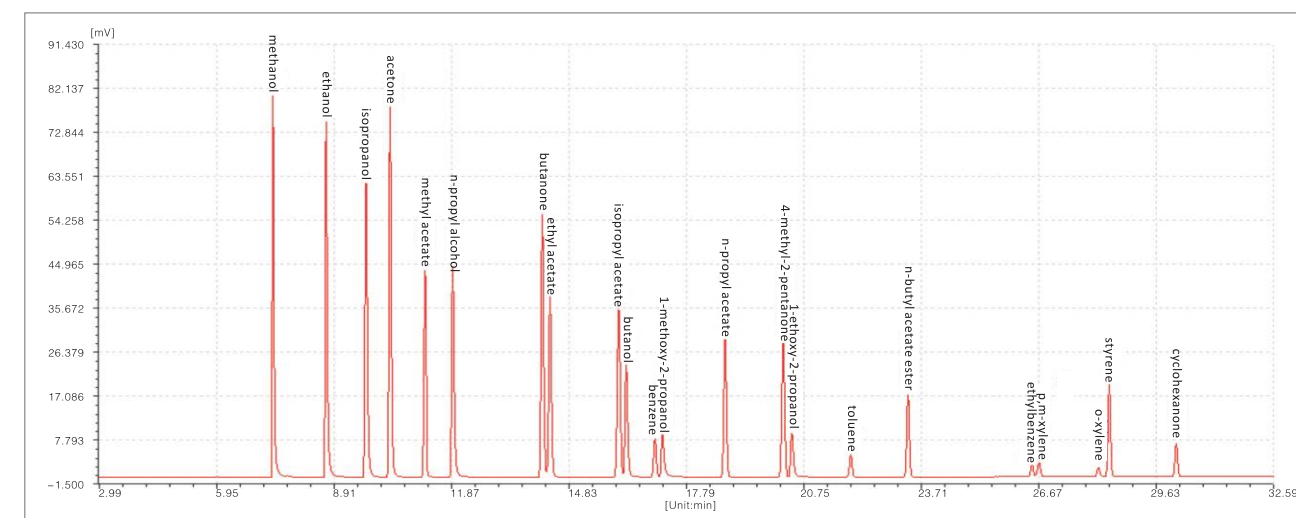
- Large screen display
- Vial numbers: 16
- Sample volume: 0.1–100 μ L
- Sampling repeatability: $\pm 0.01 \mu$ L
- Needle type: 5、10、50、100 μ L
- RSD: <0.5%



2 Head space sampler, apply in the detection of volatile/semivolatile matter in the field of environment, pharmacy polymer, criminal investigation.

• Solvent residues in the ink

Ink product is mixed raw chemical materials including pigment, polymer, solvent and various additives, among which solvent residues is key test index because of its high harmfulness.



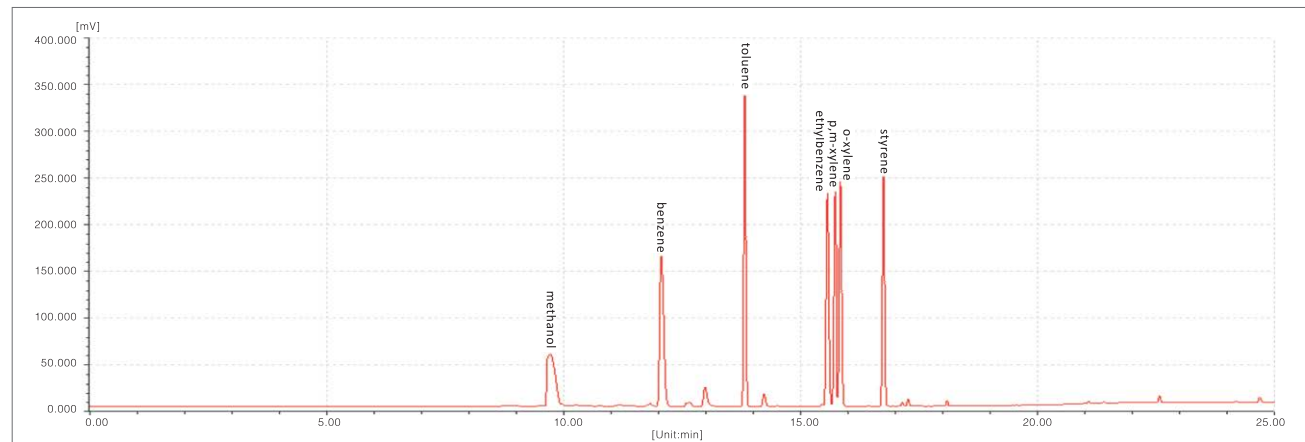
• Setup

Detector: FID Inlet: Capillary Injection mode: Head space
Column: RB-Vocol Workstation: FL9790Plus

3 Thermal desorption, volatile organic compound analysis from environment samples

● TVOC

TVOC is total volatile organic compounds that are harmful to human health, mainly including benzene series, organic chlorides, ketone, amine, alcohol, ether, ester, acid and petroleum hydrocarbon compound. Among above, benzene series is the main test index.



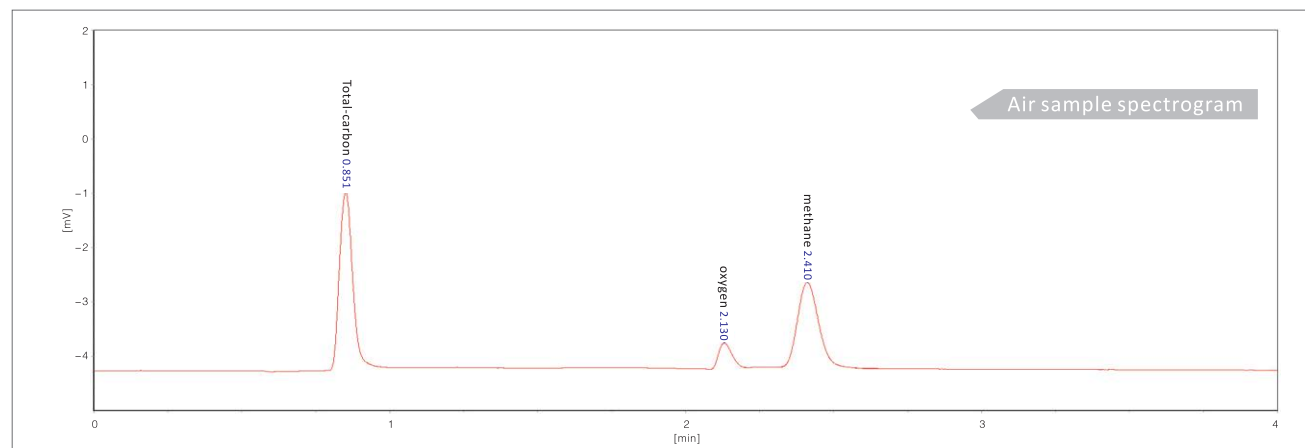
● Setup

Detector: FID Inlet: Capillary Injection mode: Thermal desorption
 Column: RB-Innowax Workstation: FL9790Plus

4 Valve switch system or methane conversion furnace, expand more complicated samples analysis

● Non-methane hydrocarbon

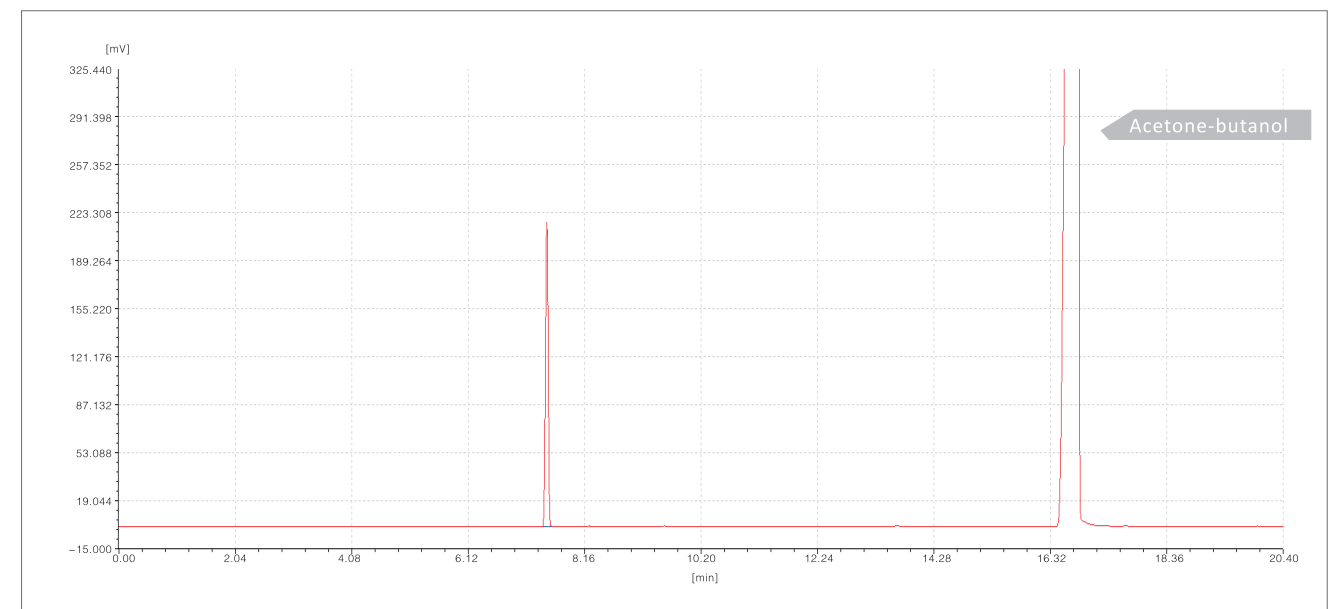
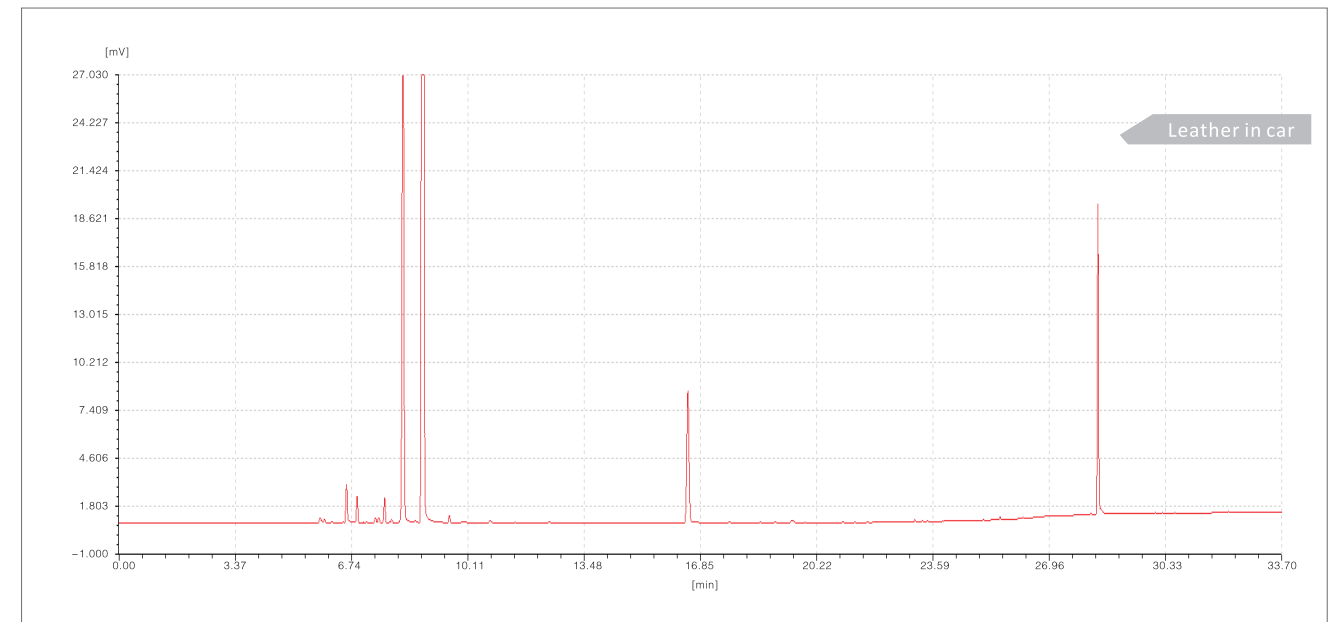
Non-methane hydrocarbon (NMHC) are all of the volatile organic hydrocarbon (mainly C₂~C₈), but with methane excluded. GC9790Plus NMHC exclusive-use system uses 10-valve system to achieve one-time injection and one-time final results output, without hand calculation and easy operation. GC9790Plus NMHC analysis patent is optional, which makes it more convenient with no need to separately analyze oxygen in samples.



● Setup

Detector: FID Inlet: Dual packed Injection mode: 10-valve
 Column: Total hydrocarbon column, methane column Workstation: FL9500 or NMHC exclusive use workstation

● Total carbon content of automobile used materials and auto parts



● Setup

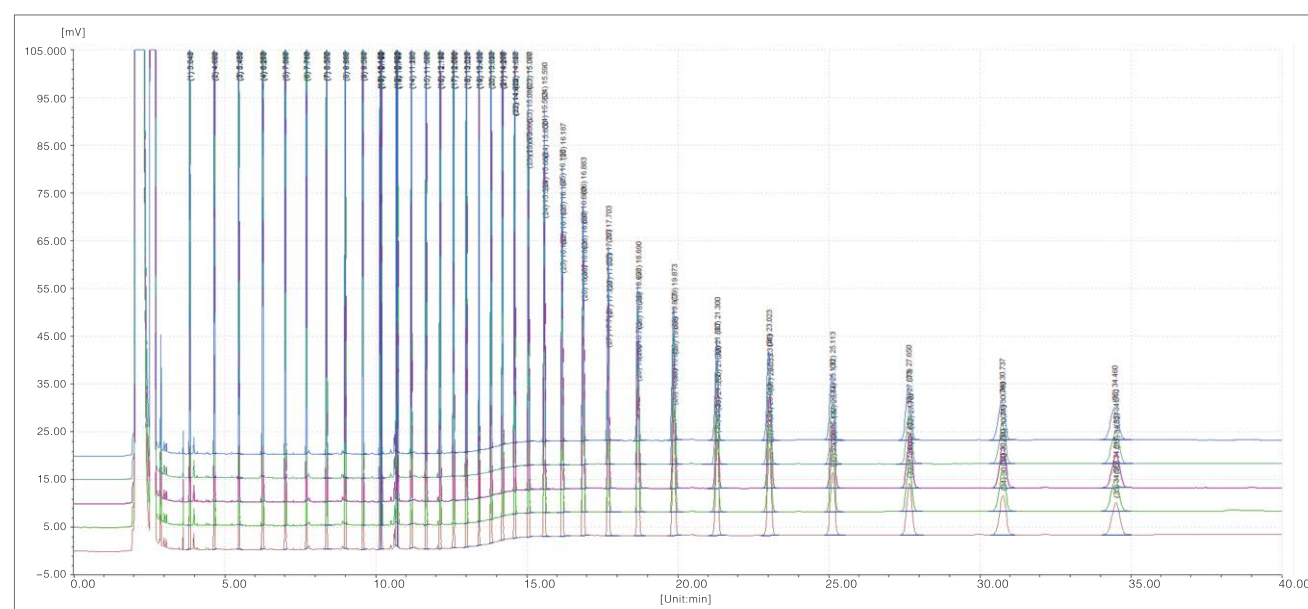
Detector: FID Inlet: Dual packed Injection mode: Head space
 Column: RB-Innowax Workstation: FL9790Plus

Ex² – Chrom high performance design

Comprehensively improve stability and precision of data

Excellent 1 Outstanding qualitative repeatability, retention time RSD ≤ 0.08%

Samples: C8-C40 naphtha



● Setup

Detector: FID Inlet: Capillary Injection mode: FL1090 autosampler
 Column: RB-5 Workstation: FL9790Plus

Serial number	Component	Average retention time	Time RSD%	Serial number	Component	Average retention time	Time RSD%	Serial number	Component	Average retention time	Time RSD%
1	C8	3.843	0.061	13	C20	10.741	0.040	25	C30	16.189	0.040
2	C9	4.665	0.064	14	C19	11.196	0.033	26	C31	16.888	0.041
3	C10	5.482	0.054	15	C20	11.681	0.058	27	C32	17.713	0.048
4	C11	6.267	0.069	16	C21	12.146	0.053	28	C33	18.699	0.037
5	C12	7.011	0.062	17	C22	12.591	0.061	29	C34	19.883	0.040
6	C13	7.711	0.049	18	C23	13.019	0.050	30	C35	21.311	0.038
7	C14	8.374	0.052	19	C24	13.431	0.051	31	C36	23.042	0.049
8	C15	8.998	0.042	20	C25	13.825	0.047	32	C37	25.135	0.058
9	C16	9.591	0.045	21	C26	14.208	0.039	33	C38	27.678	0.074
10	C17	10.153	0.046	22	C27	14.615	0.038	34	C39	30.762	0.054
11	C19	10.187	0.046	23	C28	15.074	0.040	35	C40	34.506	0.076
12	C18	10.687	0.044	24	C29	15.593	0.045				

Excellent 2 Outstanding data processing system, guarantees data stability and work simplification

● Counter-control

Can set up all the parameters used in the analysis through workstation, and monitor real time information of detector flux.

● User-friendly control

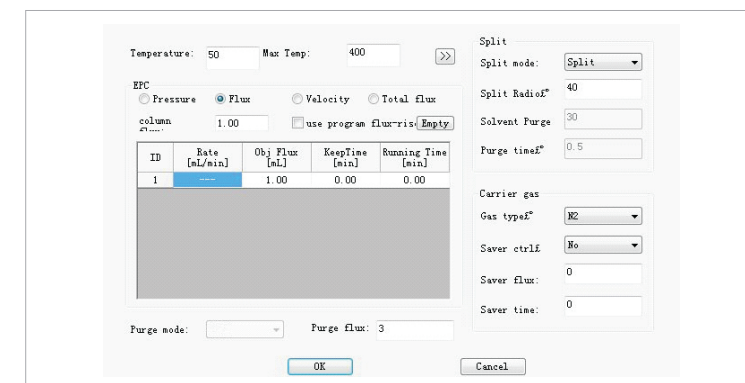
Concise and straightforward icon and menu, easy to get started.

● Multiple functions

Peak position locking, real time noise and drift calculation, preview, polynomial calculation, parameters quick-call, multi-channel signal collecting, various report styles.

● Comprehensive quantitative method

Area normalization, external standard method, internal/multi-internal standard method, index analysis and grouping calculation.



Excellent 3 Outstanding performance

Technical parameters

● Temperature control parameters

Special dual-tunnels heating system, ensures rapid heating/cooling rate. Insulating interlayer of oven is made from special materials, which ensures the stability of temperature controlling.
 Temp. range: Room temperature+8 °C~400 °C
 Temp. fluctuation : Less than ±0.1°C
 No.of temperature ramps: 11

● Gas circuit parameters

Pressure range:0~90 psi
 Precision:0.01 psi
 Pressure ramping RSD:≤0.5%
 Flux range:0~200 mL/min
 (nitrogen as carrier gas)

Index	Max. Operating Temp.	LOD/sensitivity	Noise	Drift	Dynamic linear range
FID	400°C	≤5 × 10 ⁻¹² g/s [N-Hexadecane]	≤4 × 10 ⁻¹⁴ A	≤5 × 10 ⁻¹⁴ A/30min	≥10 ⁷
TCD	400°C	≥8000mV.mL/mg [N-Hexadecane]	≤20 μV	≤100 μV/30 min	≥10 ⁴
ECD	350°C	≤1 × 10 ⁻¹³ g/mL (γ -666)	≤20 μV	≤50 μV/30 min	≥10 ⁴
FPD	400°C	P≤1.4 × 10 ⁻¹² g/s [methyl parathion] S≤5 × 10 ⁻¹¹ g/s [methyl parathion]	≤2 × 10 ⁻¹² A	≤5 × 10 ⁻¹¹ A/30min	≥10 ³ (P) ≥10 ² (S)
NPD	400°C	N≤1 × 10 ⁻¹² g/s [Azobenzene] P≤5 × 10 ⁻¹³ g/s [Malathion]	≤2 × 10 ⁻¹³ A	≤5 × 10 ⁻¹³ A/30min	≥10 ³ (P)

Instrument+ Consumables+ Application method+ Service site Fuli integrated scheme is your guardians

Instrument

- GC9790Plus gas chromatograph is an analysis instrument that has wide platform and high performance with its carrier gas controlled by AFC and AFS. Customers can make free collocation of multiple types of inlet, injection device and detector, according to their own demand. Its price/performance ratio is quite high among competing products.

Consumables

1 GC column

- Wide range of products, contain packed column and capillary column of various specifications

Packed column

Stationary liquid:

OV-1、OV-17、OV-101、OV-225、SE-30、SE-52、SE-54、PEG-400、PEG-600、PEG-1500、PEG-4000、PEG-6000、PEG-20M、DEGS、EGA、EGS、QF-1、FFAP、DNP、DBP、 β 、 β -Oxygen dipropyl nitrile、silicone oil、apiezon、squalane、DC series

Support: 5Azeolite、TDX、GDX、Porapak、Hayesep

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RubyBond GC column

RubyBond GC column (RB GC column), has a great variety of stationary phases, including polysiloxane, PEG and PLOT, and plenty product specifications. RB GC column has already widely served in a great number of labs and research institutes, because of its high inertia, low flowing away, high column efficiency, long lifetime and stable reproducibility.



RubyBond GC column

- Product characteristics

Character 1: Rigorous quality control

Inertia: Inert surface make sure samples won't be adsorbed, the peak of separated components pointed and symmetrical, which leads to more stable and reliable analysis results. With strict material selection and unique surface treatment technique that keeps column inert, it can fulfill variety of needs of customers.

Column efficiency: With stringent requirements and complete evaluation criteria, RB GC column get higher column efficiency, which ensures efficient separation ability.

Flowing-away: With mature and advanced processing technique and unique bonding crosslinking technology, RB GC column still have low flowing-away at relatively high temperature.

Reproducibility: Capacity factor and retention index are limited in a very narrow range, which ensures outstanding reproducibility between different columns.

Character 2: Excellent performance

Not only strictly controlled in the process of production, the columns are also rigorously tested about its inertia and efficiency, which leads to an extraordinary performance. Retention index and capacity factor are strictly controlled to ensure good reproducibility between columns.

Low flowing-away

The low flowing-away stationary phase is synthesized by our special processing during the production. The columns have been passivated, bonded and aged strictly before they leave the factory, which can reduce the flowing-away to the minimum and meet the requirements of trace analysis and MS detection.

High inertia

RB GC column use the most rigorous mixed standard to test. This mixed standard have the features of low molecular weight, low boiling point, active group that not be 3D shielded. Using this kind of testing samples to evaluate columns, even extremely small active adsorption can be found, which guarantees high inertia.

Character 3: Reliable after-sale service and professional technique support

Our abundant separation experience and professional knowledge can provide our customers strong technique support; Compared with other manufacturers, we have nearly 30 agencies all around the nation, that can serve our customers in the first place.

Character 4: Reasonable price

RubyBond GC column

● Introduction to the product variety

RB GC column has a great variety of stationary phases, including polysiloxane, PEG, PLOT and so on. RB GC column has plenty product specifications, and can provide special columns made to order. RB GC column strictly produced in accordance with the technological process. Each column will be tested by not only the conventional standard, but also unique professional technique, all that makes the performance of RB column is better than some famous brands. The table below compares RB column with common products on the market.

● RB GC column

RB stationary phase	Stationary phase component	Polarity	Temperature limit	Similar stationary phase
RB-1, RB-1MS	100% Dimethylpolysiloxane	Non-polar	-60 to 325/350	DB-1, HP-1, DB-1MS, HP-1MS, Ultra-1, Rtx-1, ZB-1, BP-1, SPB-1, CP-Sil 5CB
RB-5, RB-5MS	5% Diphenyl 95% Dimethylpolysiloxane	Non-polar	-60 to 325/350	DB-5, HP-5, DB-5MS, HP-5MS, Ultra-2, Rtx-5, ZB-5, BP-5, SPB-5, CP-Sil 8CB
RB-35	35% Phenyl backbone 65% Dimethylpolysiloxane	moderate polarity	40 to 300/320	HP-35MS, DB-35MS, ZB-35, BPX-35, AT-35, Rtx-35, SPB-35
RB-50 RB-50+MS	50% Phenyl backbone 50% Dimethylpolysiloxane	moderate polarity	40 to 320/340	HP-50+, DB-17, DB-17MS, Rtx-50, ZB-50, SPB-50, 007-17, SP-2250, CP-Sil 24CB
RB-1301	6% Cyanopropyl-phenyl 94% Dimethylpolysiloxane	moderate polarity	-20 to 280/300	HP-1301, DB-1301, ZB-1301, BP-10, Rtx-1301
RB-1701	14% Cyanopropyl-phenyl 86% Dimethylpolysiloxane	moderate polarity	-20 to 280/300	DB-1701, ZB-1701, BP-10, Rtx-1701, CP-Sil 19CB
RB-624	6% Cyanopropyl-phenyl 94% Dimethylpolysiloxane	moderate polarity	-20 to 260	DB-624, ZB-624, AT-624, Rtx-624, CP-624
RB-225	50% Cyanopropylphenyl 50% Dimethylpolysiloxane	moderate polarity	40 to 220/240	DB-225, SP-2330, CP-Sil 43 CB, Rtx-225, BP-225, OV-225, 007-225, AT-225

RB stationary phase	Stationary phase component	Polarity	Temperature limit	Similar stationary phase
RB-InnoWax	Polyethylene glycol	Polarity	40 to 260/280	HP-INNOWax, DB-WAX, DB-WAXetr, Supelco WAX10, CB-WAX, AT-Wax, HP-20M
RB-CarboWax	Polyethylene glycol	Polarity	60 to 220	HP-20M, DB-CAM
RB-FFAP	Polyethylene glycol, acid modified	Polarity	50 to 260	HP-FFAP, DB-FFAP, CP-WAX 58(FFAP)CB, BP-21, AT-100
RB-PLOT Molesieves 5A	Molecular sieves, zeolite, 5A		-80 to 300	HP-PLOT Molesieve, CP-PLOT Molesieve
RB-PLOT Al ₂ O ₃ "KCl"	KCl modified Alumina		-60 to 200	HP-PLOT Al ₂ O ₃ /KCl, GS-Alumina/KCl, CP-Al ₂ O ₃ /KCl PLOT
RB-PLOT Al ₂ O ₃ "S"	Na ₂ SO ₄ modified Alumina		-60 to 200	HP-PLOT Al ₂ O ₃ /"S", GS-Alumina, CP-Al ₂ O ₃ /Na ₂ SO ₄ PLOT, RT-Alumina
RB-PLOT Al ₂ O ₃ "M"	Na ₂ MoO ₄ modified Alumina		-60 to 200	HP-PLOT Al ₂ O ₃ /"M", GS-Alumina
RB-PLOT Q	Divinylbenzen polymer	Non-polar	-80 to 280/300	HP-PLOT Q, GS-Q, CP-PoraPLOT Q HT, Rt-Q
RB-PLOT U	Divinylbenzen ethylene glycol Dimethacrylate Gopolymer	Polarity	-80 to 190/200	HP-PLOT U, CP-PoraPLOT U

Other brand columns are also available in Fuli's GC, like Restek series, DB series, HP series, etc.

2 Instrument accessories

- Fuli has own processing plant, which ensures excellent quality of accessories like valves, pipelines, joints, seal packing and purification devices. Customers are offered more solutions.

Application method

- Fuli has complete laboratory hardware condition and a whole set of lab operating system, can rapidly response to customers' development demand.