

## Comparison of GsBP™ and JW GC Columns

GS-Tek, a USA GC column manufacturer located in Delaware USA, offers complete GsBP™ GC column product line to worldwide chromatographers. Rooted in the original developer experiences of a major brand GC column started in 1990, and greatly re-engineered GC column process, GsBP™ GC columns have similar and improved performance to the major brand GC columns. Even though GsBP™ GC column is a new comer to market, GsBP™ GC columns gain market recognition from its similar and improved separations for many old and new applications.

### Main features of GsBP™ GC columns:

- Complete offers with robust, better quality and cost effectiveness, and confidence
- Similar performances and qualities to major brands
- Improved column selectivity and inertness for many challenging applications
- Quick turn-around customizations for method development

### Customer feedbacks:

In spite of very short time in market, GsBP™ columns have been gained wide customer acceptances. Many customers provide their positive feedback and recommend their colleagues and friend. The following are except of the customer comments.

Mr. Wang, Senior Engineer, Quality Inspection Center, Sinopec Zhenhai Refining & Chemical Company, Zhenhai, Zhejiang

***"We bought three GC columns from GS-Tek (China) on Feb.26<sup>th</sup> 2014. The price is good. We don't know much about these columns at that time. So we tested these three columns for four days, compared with similar columns made by Agilent under the same condition. The result shows that GsBP™ columns are better than Agilent ones."***

Mr. He, Director of Hainan environmental testing Center, Hainan, China

***"The separation of GsBP-624UI is better than DB-624UI"***

Mr. Li, Lab manager, Shanghai Institute of Food and Drug Control, Shanghai, China

***"We use GsBP-5 column to develop new applications, because it provides good result and reduces cost"***

Mr. Liao, Manager, CTI Co., Ltd, Ningbo, China

*"Thanks GS-Tek offering trial columns, here is our feedback:*

*2 weeks DMF 40injections, NP, 52 injections, PAH 614 injections, PAEs, 604 injections, SVOC, 246 injections*

*3weeks after trimmed inlet 1m: DMFs, 12 injections, NP 26 Injections, PAH 202 injections, PAEs 462 injections, SVOCs, 272 injections.*

Dr. Yang, Ex-Beijing Research Institute of Chemical, Beijing, China

Test report for GC-MS Diesel analysis, GsBP-1MS

*"Tests indicate that GsBP-1MS is very similar to HP-1MS in characteristics, but a lower bleeding at high temperature"*

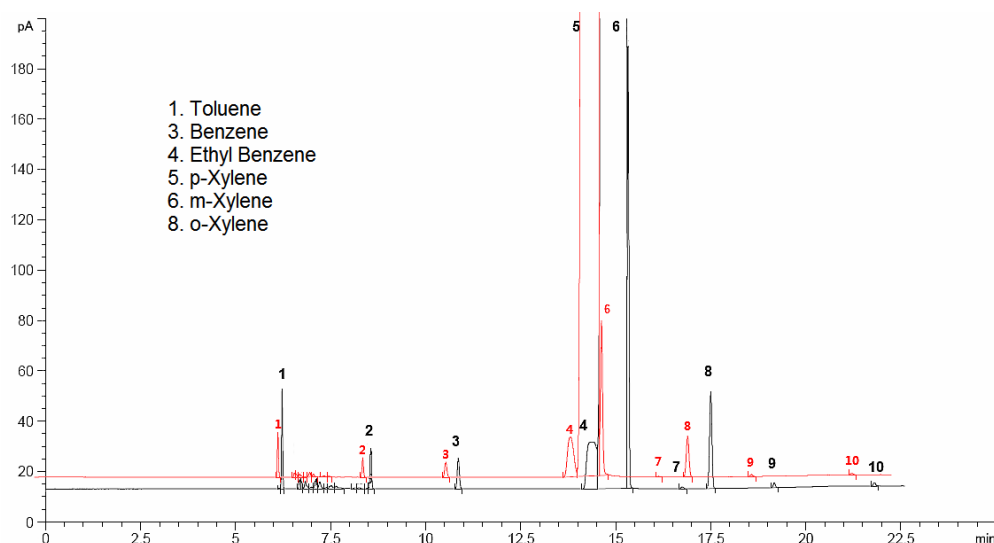
Naizhong Zou, Beijing Chrom Institute, PIONA Analysis, Beijing, China

*"The results indicate that the GsBP-PONA column is similar to HP-PONA in both separation and retention time"*

## Comparison of GsBP™ and JW GC Columns

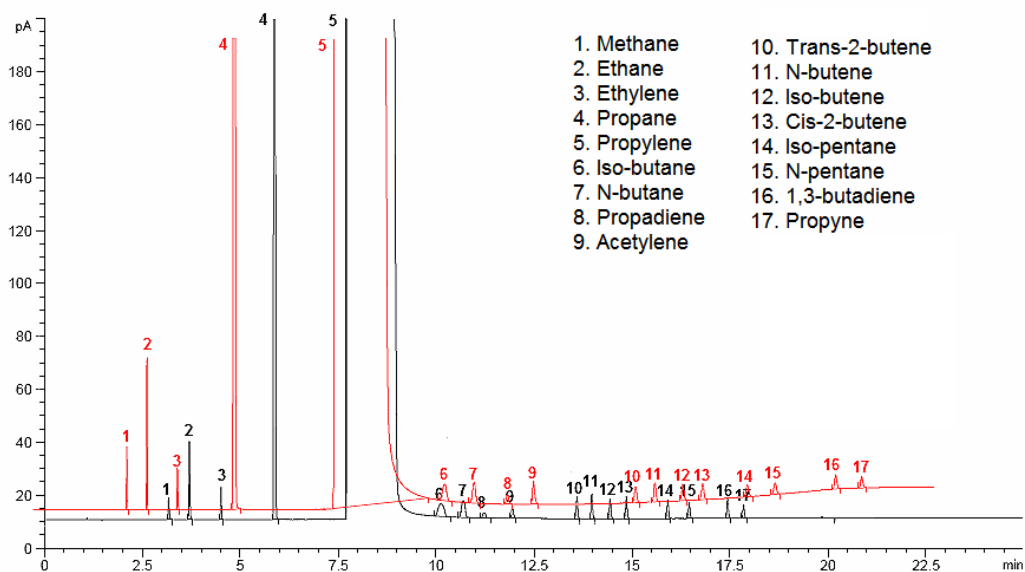
### P-Xylene, Petrochemical

Columns: GsBP-Inowax, 60m x 0.32mm x 0.5um (Red) (2032-6005) vs HP-Inowax, 60m×320um×0.50um (Black) (19091N-216)



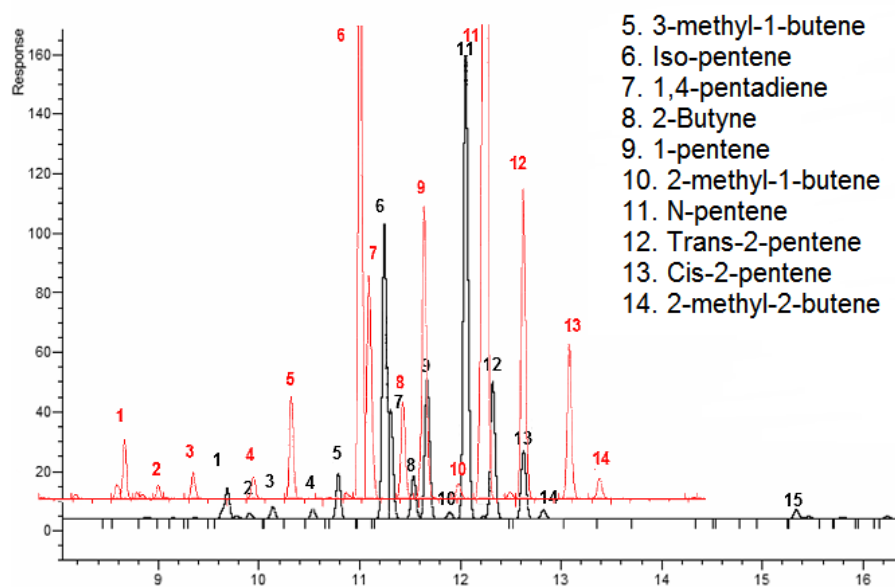
## Propylene on Al<sub>2</sub>O<sub>3</sub> PLOT Columns, Petrochemical

Columns: GsBP-PLOT Al<sub>2</sub>O<sub>3</sub>, "S", 50m x 0.53mm x 15um (Red) (8253-5015) vs HP-PLOT Al<sub>2</sub>O<sub>3</sub> "S", 50m x 0.53mm x 15um (Black) (19091P-S25)



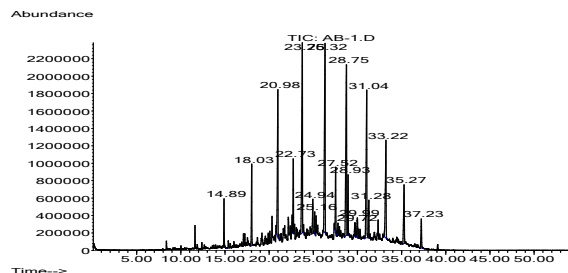
## Pentenenes on PONA columns, Petrochemical

Columns: GsBP-PONA, 100m x 0.25mm x 0.5um (Red) (9006-PONA) vs HP-PONA, 50m x 0.20mm x 0.5um (Black) (19091S-001)



## Diesel on 1MS columns, Refining

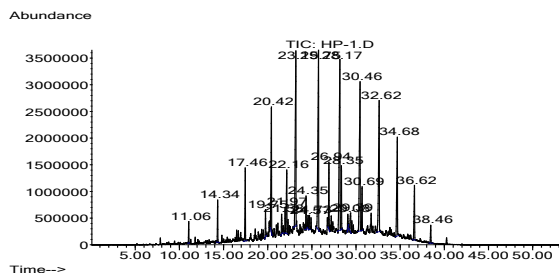
Columns: GsBP-1MS 30m x 0.25mm x 0.25  $\mu$ m (1125-3002) (Left) vs HP-1MS 30m x 0.25mm x 0.25 $\mu$ m (19091S-933) (Right)



Peak & retention time, GsBP

C17: 28.75min    Pristane: 28.93min

C18: 31.04min    Phytane: 31.28min



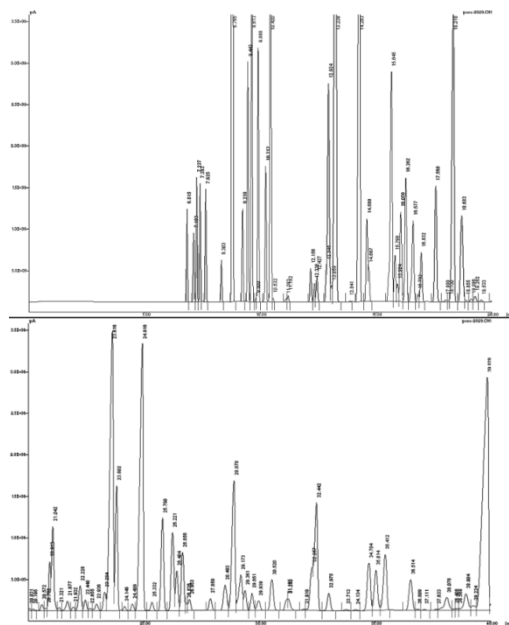
Peak & Retention time, HP

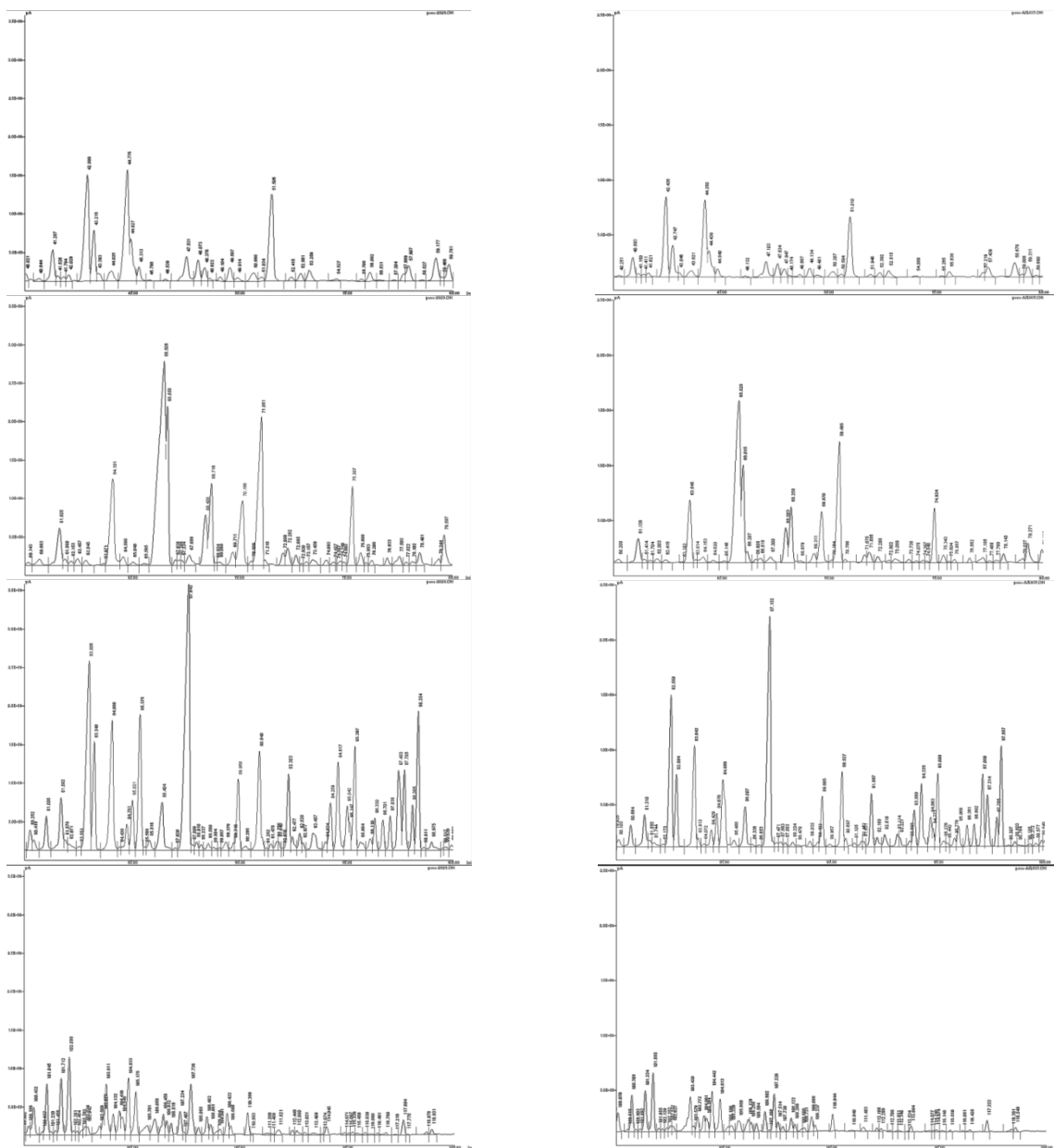
C17: 28.17min    Pristane: 28.35min

C18: 30.46min    Phytane: 30.69min

## PIONA Analysis, Refining

Columns: GsBP-PONA, 50m x 0.20mm x 0.5 $\mu$ m (9002-PONA) (Left) vs HP-PONA, 50m x 0.20mm x 0.5 $\mu$ m, (19091S-001) (Right)



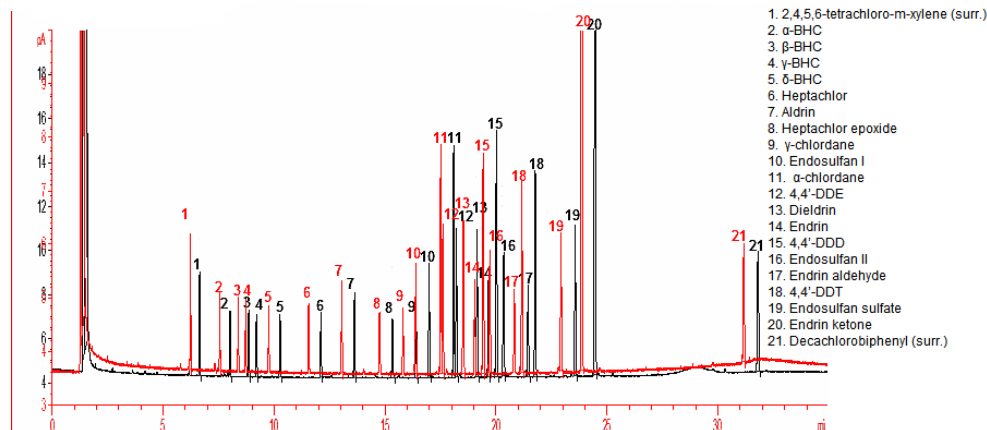


## Reports

Column	GSBP-PONA	HP-PONA
No. of Peaks	300	301
RON	87.26	87.15
MON	78.18	78.07
C:H	7.33	7.34
Density	0.8064	0.8062
<b>PIONA</b>	<b>Wt%</b>	<b>Wt%</b>
P	3.29	3.28
I	25.81	25.69
O	9.34	9.40
N	15.74	15.72
A	46.02	45.91

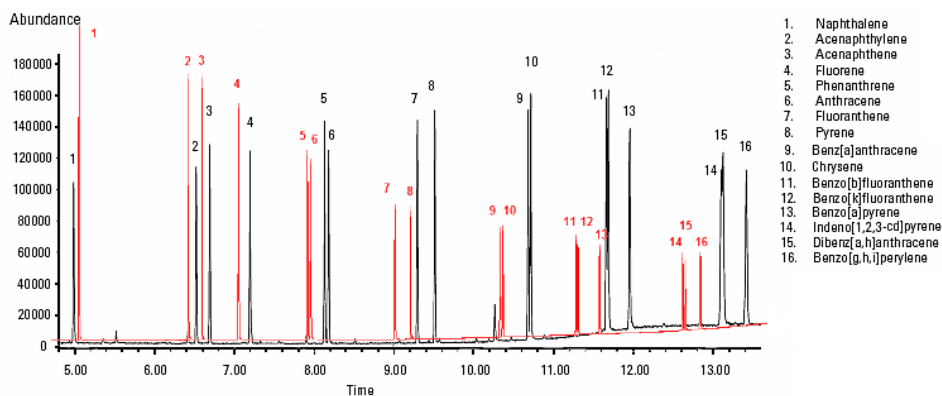
## Pesticide separations on 5MS columns, Food Safety

Columns: GsBP-5MS 30m x 0.25mm x 0.25um (1525-3002) (Red) vs DB-5MS, 30m x 0.25mm x 0.25um (122-5532) (Black)



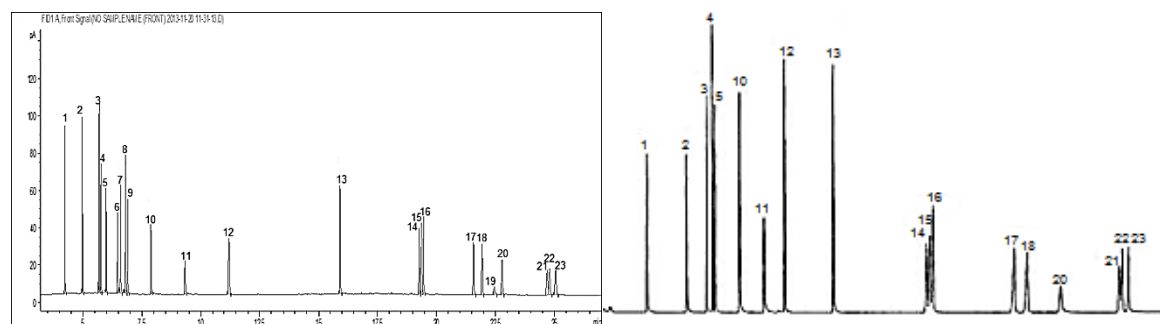
## PAHs by customized 5MS columns, Environmental & Food Safety

Columns: GsBP-5MS PAH (Red) (1525-3002PAH) vs DB-5MSPA (Black) (122-5532)



## Azo Dye by 5MS columns: Consumables Safety

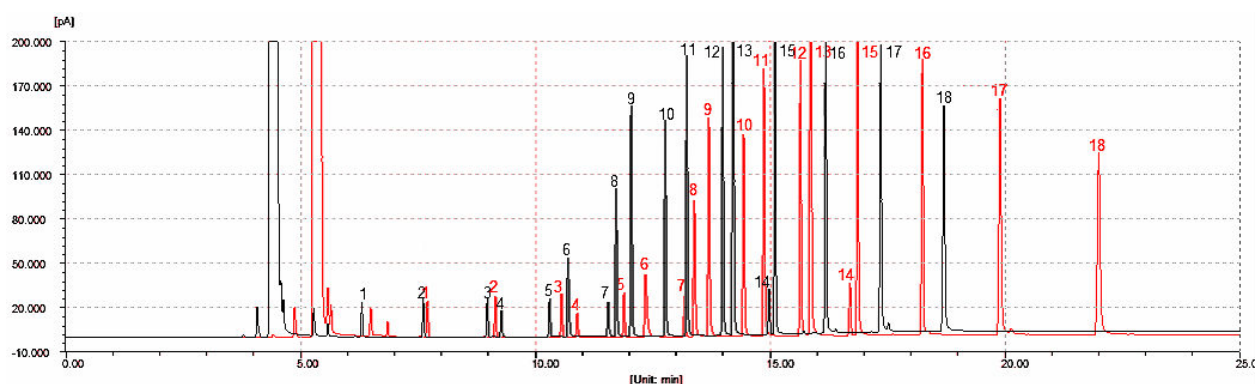
Columns: GsBP-5MS PAH 30m x 0.25mm x 0.25um (1525-3002) (Left) vs DB-5MS 30m x 0.25mm x 0.25um (122-5532) (Right)



1	Aniline	9	2,4,5-Trimethylaniline	17	3,3'-Dichloro-4,4'-diaminodiphenylmethane
2	1,4-Diaminobenzene	10	4-Chloro-o-toluidine	18	4,4'-Diaminodiphenylmethane
3	o-Toluidine	11	2,4-Diaminotoluene	19	3,3'-Dimethyl-4,4'-diaminodiphenylmethane
4	2,4-Dimethylaniline	12	2,4-Diaminoanisole	20	3,3'-Dimethylbenzidine
5	2,6-Dimethylaniline	13	β-Naphthylamine	21	4,4'-Thiodianiline
6	O-Anisidine	14	4-Aminobiphenyl	22	3,3'-Dichlorobenzidine
7	p-Chloroaniline	15	4,4'-Diaminodiphenyl ether	23	3,3'-Dimethoxybenzidine
8	5-Methoxy-2-methylaniline	16	Benzidine		

## Organic acids on FFAP columns, Chemical and Consumables

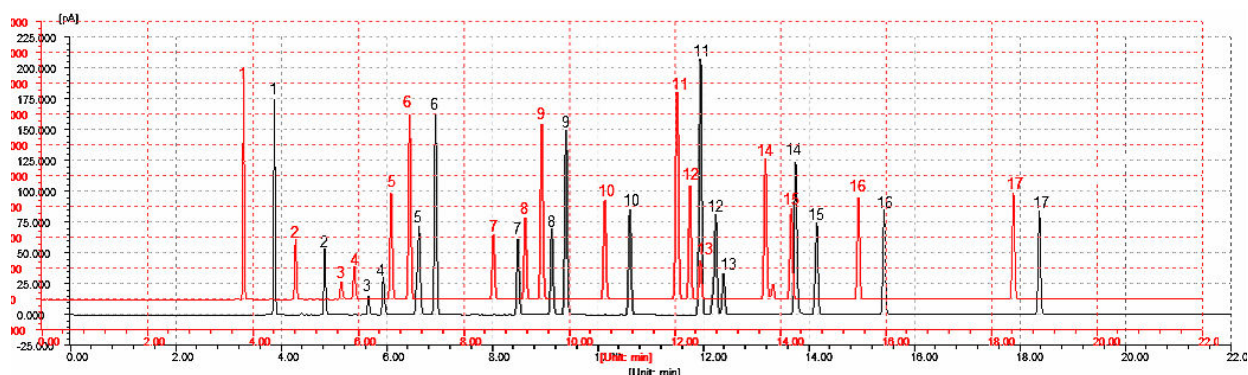
Columns: GsBP-FFAP, 30m x 0.32mm x 0.25um (2132-3002) (Red) vs DB-FFAP, 30m x 0.32mm x 0.5um (123-3233) (Black)



Compound: Acetic acid, Propanoic acid, Butyric acid, Valeric acid, Isovaleric acid, Hexanoic acid, Heptanoic acid, Octanoic acid, Nonanoic acid, DL-Lactic acid, 2,2-DiMethylolbutanoic acid

## Common Solvents on Inowax, Pharma, Homeland Security

Columns: GsBP-Inowax, 30m x 0.32mm x 0.5um (2032-3005) (Red) vs DB-Wax, 30m x 0.32mm x 0.5um (123-7013) (Black)

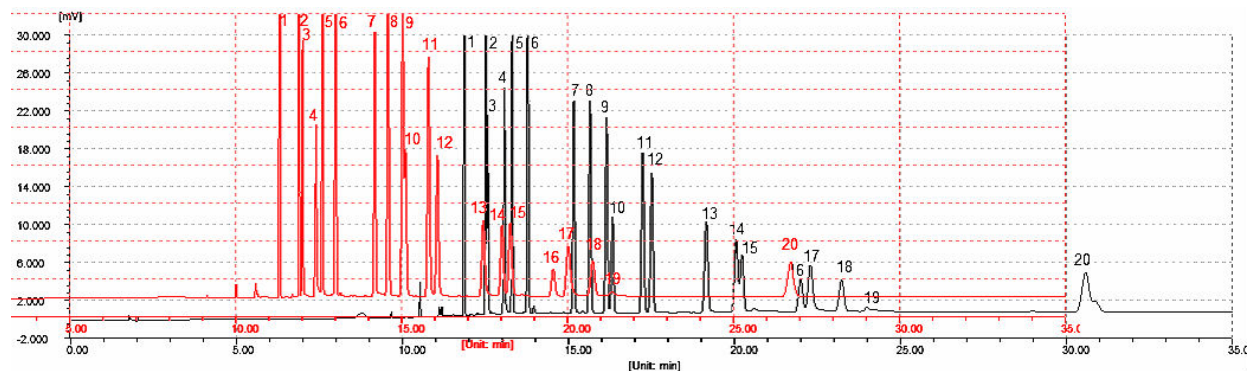


Compound: Methanol, Ethanol, Acetone, Acetonitrile, Dichloromethane, 1-Propanol, iso-Butanol, Carbon tetrachloride, Benzene, Octane, 1-Butanol, 3-Pentanol, Pyridine, Toluene, 1-Pentanol, Ethylbenzene, m/p-Xylene, 1-Hexanol, o-Xylene



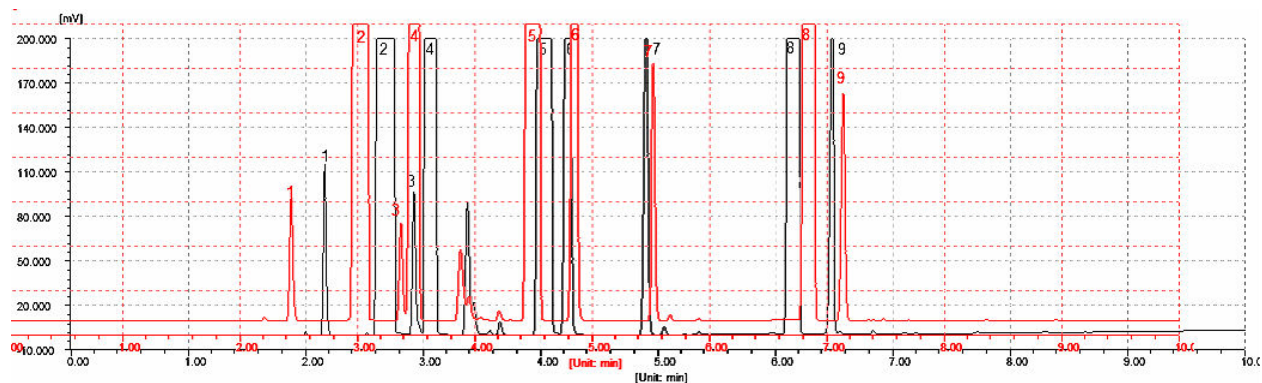
## 20 Halogens on DB-17/GsBP-50+MS columns, Water Analysis

Columns: GSBP-50+MS, 30m x 0.25mm x 0.25um (5025-3002) (Red) vs DB-17 30m x 0.25mm x 0.25um (122-1732) (Black)



## 9 Halogens on GsBP-1701 and DB-1701 columns, Water Analysis

Columns: GsBP-1701, 30m x 0.32mm x 1.0um (6132-3010) (Red) vs DB-1701, 30m x 0.32mm x 1.0um (123-0733) (Black)



Compound: Dichloromethane, 1,2-Dichloroethane, Carbon tetrachloride, Trichloroethylene, 1,1,2-Trichloroethane, Tetrachloroethylene, 1,1,1-Trichloroethane, Tetrachloroethane, 1,2,3-Trichloropropane

Above applications have demonstrated that GsBP™ GC columns have produced very similar separations to JW columns for the applications in petroleum and petrochemicals, environmental monitor, third party testing labs, and pharmaceutical industries.

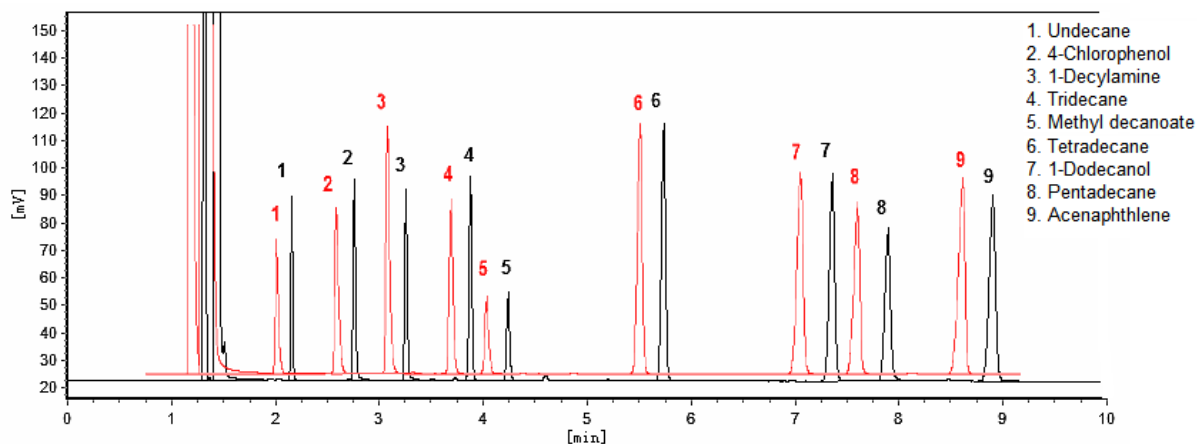


## GsBP™ GC Column Quality Practices

Each GsBP™ column is gone extensive quality and performance tests to ensure high quality and performances with internal specifications. The following are comparisons of GsBP standard test to JW columns.

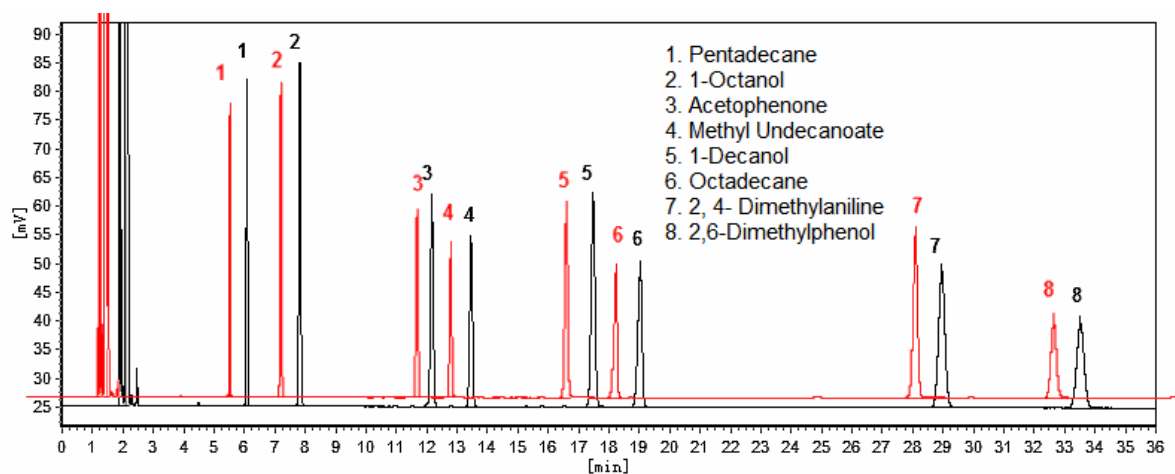
### 5 Series Columns

Columns: GsBP-5, 30m x 0.25mm x 0.25um (0532-3002) (Red) vs HP-5, 30m x 0.25mm x 0.25um (19091J-433) (Black)



### Inowax Columns

Columns: GsBP-Inowax (Red) 30m x 0.25mm x 0.25um (2025-3002) vs HP-INNowax (Black), 30m x 0.25mm x 0.25um (19091N-113)



### Conclusion :

Both standard QC test and wide applications have demonstrated GsBP™ columns have very similar or equivalent results to JW columns. GsBP columns can be good replacement to JW columns with confidence.

## The order info of the listed columns:

Application	Industry	Catalog Number	Column Description	Similar to JW Column
Xylenes	Petrochemical	2032-6005	GsBP-Inowax, 60m x 0.32mm x 0.5um	19091N-216
Propylene	Petrochemical	8253-5015	GsBP-PLOT Al <sub>2</sub> O <sub>3</sub> "S", 50m x 0.53mm x 15um	19095P-S25
Pentenenes	Petrochemical	9006-PONA	GsBP-PONA, 100m x 0.25mm x 0.5um	122-10A6
Diesel	Refinery	1125-3002	GsBP-1MS, 30m x 0.25mm x 0.25um	19091S-933
Naphthalene PIONA	Refinery	9002-PONA	GsBP-PONA, 50m x 0.25mm x 0.5um	19091S-001
22 Chlorinate Pesticides	Food Safety	1525-3002	GsBP-5MS, 30m x 0.25mm x 0.25um	122-5532
PAHS	Environmental	1525-3002PAH	GsBP-5MS-PAH, 30m x 0.25mm x 0.25um	122-5532
Azo Dyes	Consumables	1525-3002	GsBP-5MS, 30m x 0.25mm x 0.25um	19091S-433
Fatty acids	Chemical, Consumables	2132-3002	GsBP-FFAP, 30m x 0.32mm x 0.25um	123-3233
Solvents	Homeland Security, Pharma	2032-3005	GsBP-Inowax, 30m x 0.32mm x 0.5um	123-7013
20 halogens	Water Analysis	5025-3002	GsBP-50+MS, 30m x 0.25mm x 0.25um	122-1732
9 Halogens	Water Analysis	6132-3010	GsBP-1701, 30m x 0.32mm x 1.0um	123-0733
5MS QC test	General	0525-3002	GsBP-5, 30m x 0.25mm x 0.25um	19091J-433
PEG QC test	General	2025-3002	GsBP-Inowax, 30m x 0.25mm x 0.25um	19091N-113

## Acknowledgement:

### GS-Tek special thanks the following customers for their evaluation feedbacks:

Huixing Wang, Senior Engineer of Quality Inspection Center, Sinopec Zhenhai Refining & Chemical Company, Zhejiang, China

Haibo He, Director of Hainan environmental testing Center, Hainan, China

Wei Liao, Manager of CTI Co., Ltd, Zhejiang, China

Mr. Li, Lab manager, Shanghai Institute of Food and Drug Control, Shanghai, China

Dr. Yongtan Yang, Technical Manager of Analysis Lab, Ex-Beijing Research Institute of Chemical, Beijing, China

Naizhong Zou, Beijing Chrom Institute, PIONA Analysis, Beijing, China

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