GS-Tek

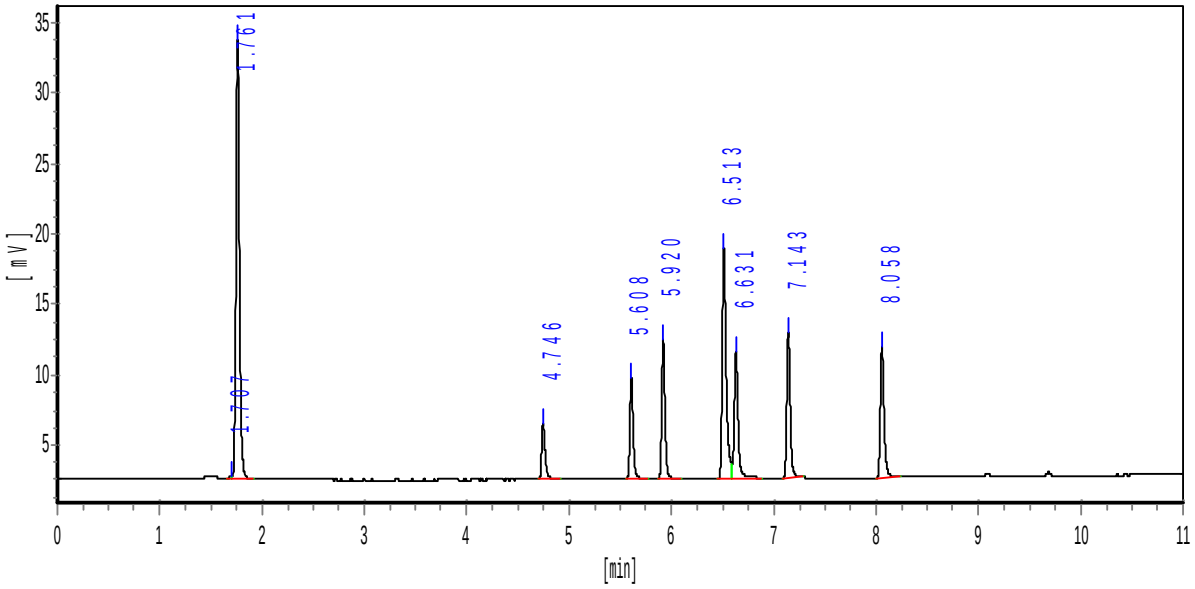
Inertness of GsBP-Inowax glycols: Free fatty acid test report

Current demanding GC and GC/MS applications have an increased focus on sensitive analysis of more challenging active analytes. We have successfully improved the inertness of the entire GC flow path by using Ultra Inert columns and system such as Ultra Inert liners, Gold Seals, split/splitless top. In this note, we present a new polyethylene glycol (PEG) GC Column GsBP-Inowax glycols 2632-3002 with improved inertness reliability. Low levels of EG and free fatty acid were tested in this method. Due to the chemical properties of these compounds, particularly the multiple active hydroxyl (-OH) functional groups and acid groups, their peaks often exhibit tailing when analyzed using traditional PEG stationary phase GC columns. We can supply this column for the special application according to customers' requirement.

In the first part, the free fatty acid as well as the EG separation was recorded. The instrumentation condition is shown as follows,

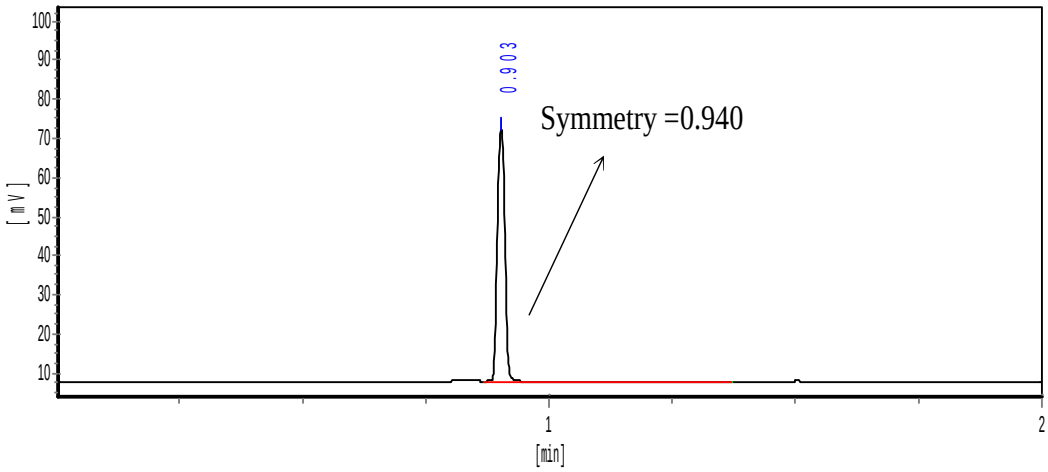
GC: Agilent 5890 w/ FID
Cat no: 2632-3002 GsBP-Inowax glycols 30m x 0.32mm x 0.25um
Oven: 80℃ 1min 20℃/min to 120℃ 6℃/min 205℃ 2min
Carrier: Hydrogen, 8psi
Inlet: Split, 240 ℃, split flow 50ml/min
Detector: FID 260 ℃
Samples: Free Fatty Acids Test Standard（Cat.#:35272）
Inject volume: 1ul

Free fatty acid separation was achieved on this column. The chromatogram and peak identification table are shown below. The symmetry is nearly 1 for each component.

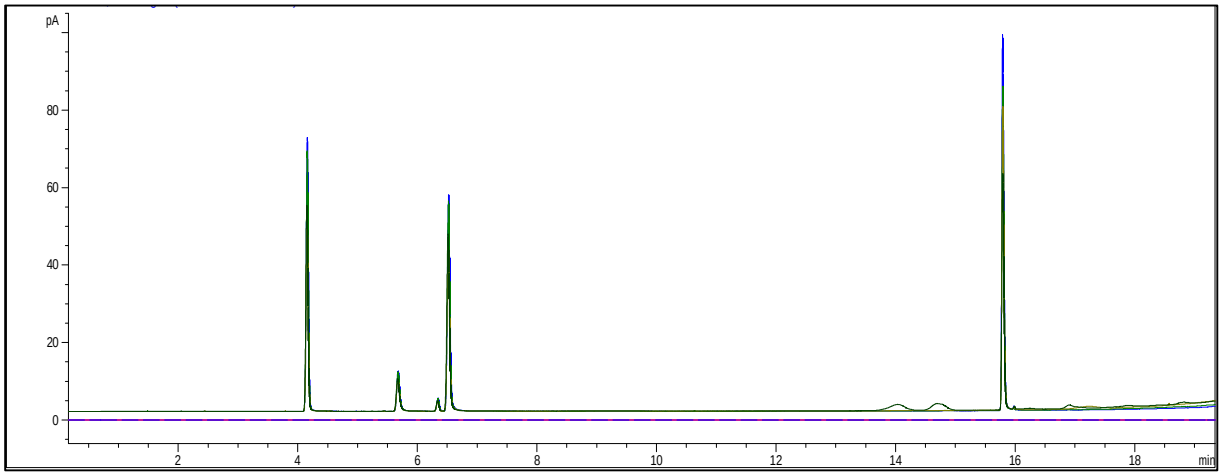


Peak#	Compound	Retention Time	Symmetry
1	Acetic acid	4.746	1.446
2	Propionic acid	5.608	1.324
3	Isobutyric acid	5.92	1.212
4	Butyric acid	6.513	1.447
5	Isovaleric acid	6.631	1.326
6	Valeric acid	7.143	1.209

EG separation on 2632-3002 GsBP-Inowax glycols with symmetry of 0.94 is shown below.

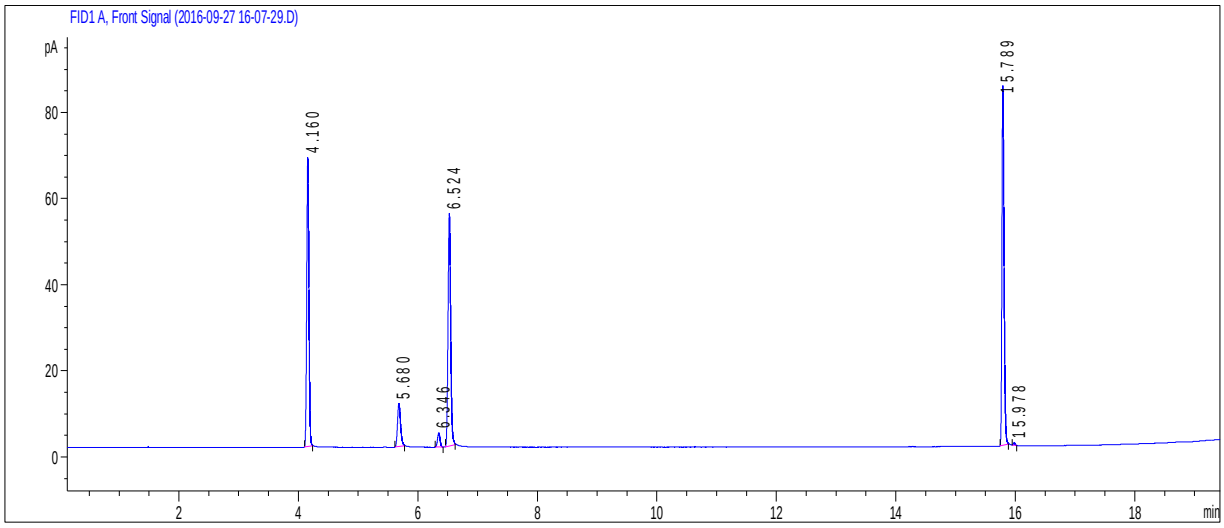


In the second part, ethanol separation was achieved on 2632-3002. Ethanol, methanol, acetone and acetic acid are not easily extracted from aqueous samples and the demand of such component analysis is highly increased, especially in liquor industry. Therefore, we provided the solvent analysis results with repeatability test.



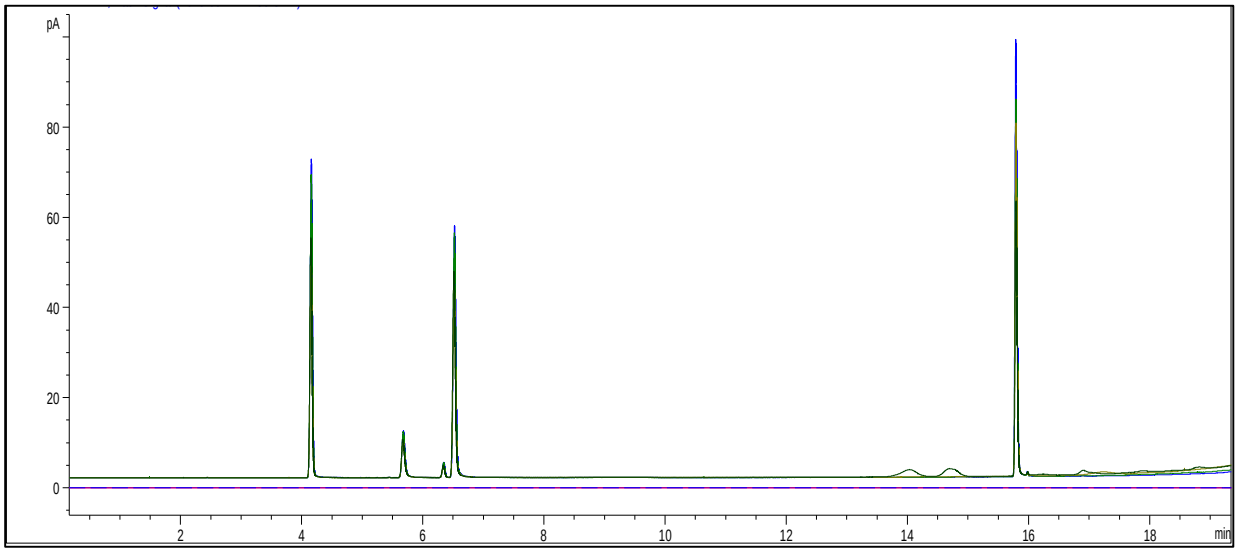
The instrumentation condition is shown as follows,

GC: Agilent 7890 w/ FID
Cat no: 2632-3002 GsBP-Inowax glycols 30m x 0.32mm x 0.25um
Oven: 40℃ 4min 10℃/min to 200℃ 1min
Carrier: Hydrogen, 1.1ml/min
Inlet: Split, 240 ℃, split flow 40ml/min
Detector: FID 260 ℃
Samples: residual solvent mixture (ethanol, methanol, acetone, acetic acid) in water
Inject volume: 1ul



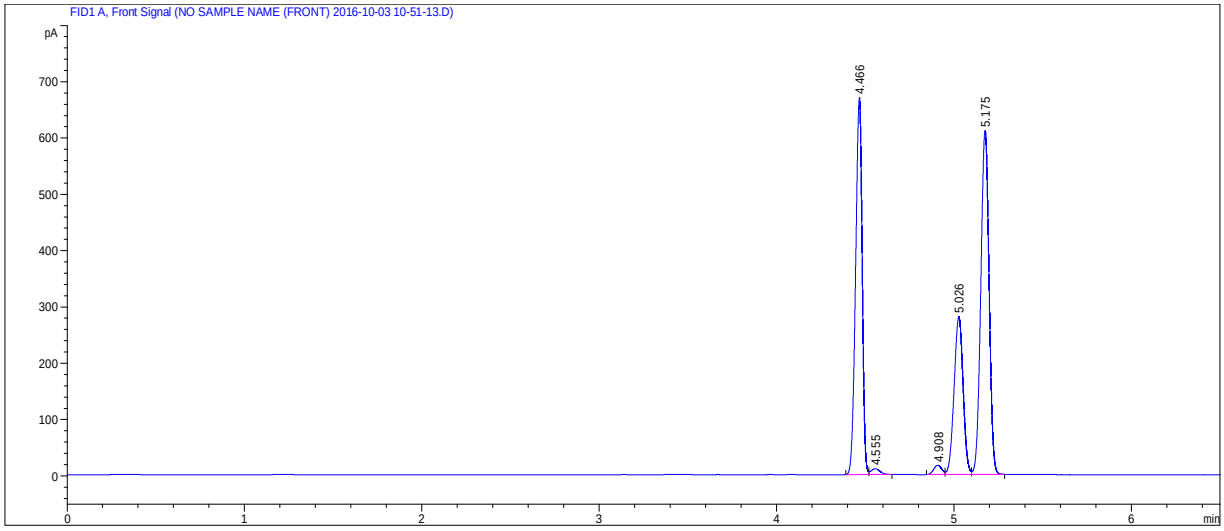
Peak#	Compound	Retention Time	Symmetry
1	Methanol	4.180	0.916
2	Ethanol	5.680	0.825
3	Acetone	8.524	0.910
4	Acetic acid	15.789	0.887

Besides, we monitored the first three injections as well as the last three injections during 50 times injection. The repeatability result was shown below,



The chromatogram showed that there was no time shift after repeated injections, which means the results should be consistent and the lifetime was not significantly reduced even if the samples contained some “active” components.

In the third part, we want to discuss the separation of some critical pairs: benzene and ethanol in water.



Peak#	Compound	Retention Time	Resolution
1	Ethyl acetate	4.466	
2	Benzene	5.026	
3	Ethanol	5.175	2.814

Baseline separation of Benzene and ethanol could be achieved on 2632-3002 with good peak shape even when a large amount of sample was injected.

Conclusion：

After correct installation and clean system, our columns could have good internes. Free fatty acid separation could be achieved with improved peak shapes.

THANKS for your interest in our products.

September, 6th, 2016

Zoe Wang

General Separation Technologies, Inc.

625 Dawson Drive, Suite A

Newark, DE 19713 USA

Cel: (302) 220-8946

Tel: (302) 533-5646

Fax: (302) 737-4547

Website: www.gs-tek.com

Emaill: zoe_w@gs-tek.com