FAST Separations of Refinery Gas C1 to C6 within 7min

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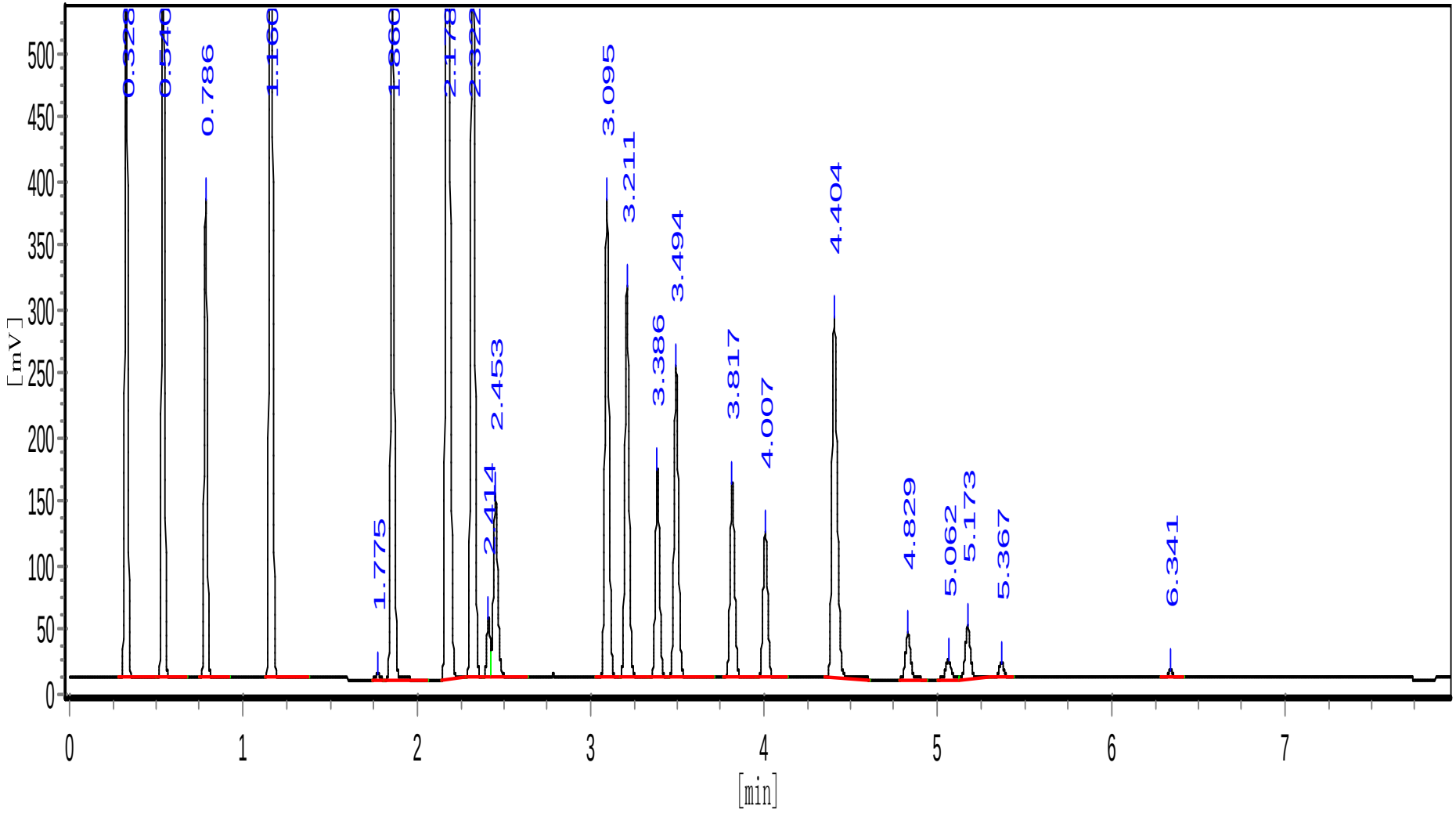
Instrumentation Conditions

- GC: HP 5890 w/ FID
- Cat no: *8253-3000 GsBP-PLOT Al2O3, 30m x 0.53mm*
- Oven: 65℃ 35 ℃ /min to 150℃ 10℃ /min to 200℃(1min)
- Carrier: Hydrogen, column pressure 5psi
- Inlet: Split, 200 ℃, split flow 60ml/min
- Detector: FID 200 ℃
- Sample: 100ul, refinery gas standard #2 (DCG Partnership I, LTD, serial#590646)

Chromatogram



Peak Identifications and Resolutions:

Peak#	Compound	Retention Time	Resolution
1	Methane	0.328	
2	Ethane	0.54	
3	Ethylene	0.786	
4	Propane	1.16	
5	Cyclopropane	1.775	
6	Propylene	1.86	4.36
7	i-Butane	2.178	
8	n-Butane	2.322	
9	Propadiene	2.414	4.09
10	Acetylene	2.453	1.66
11	Trans-2-butene	3.095	
12	1-Butene	3.211	4.83
13	Iso-butylene	3.386	
14	c-2-butene	3.494	4.41
15	Iso-pentane	3.817	
16	Pentane	4.007	
17	1,3-Butadiene	4.404	
18	Propyne	4.829	

Peak#	Compound	Retention Time	Resolution
19	trans-2-Pentene	5.062	
20	1-Pentene	5.173	3.70
21	cis-2-Pentene	5.367	
22	n-Hexane	6.341	

Conclusions

- Fast baseline separations of C1 to C6s including C5 olefins and n-C6 in a refinery gas sample has been achieved within 7 minutes on a propriety 30m Al2O3 PLOT column and 65C starting temperature
- The separation time can be further reduced to less than 6minutes by fine tuning the temperature program used
- This analysis can be extended to C8 at temperatures 200-225C