

FAST Separations of C1 to C8

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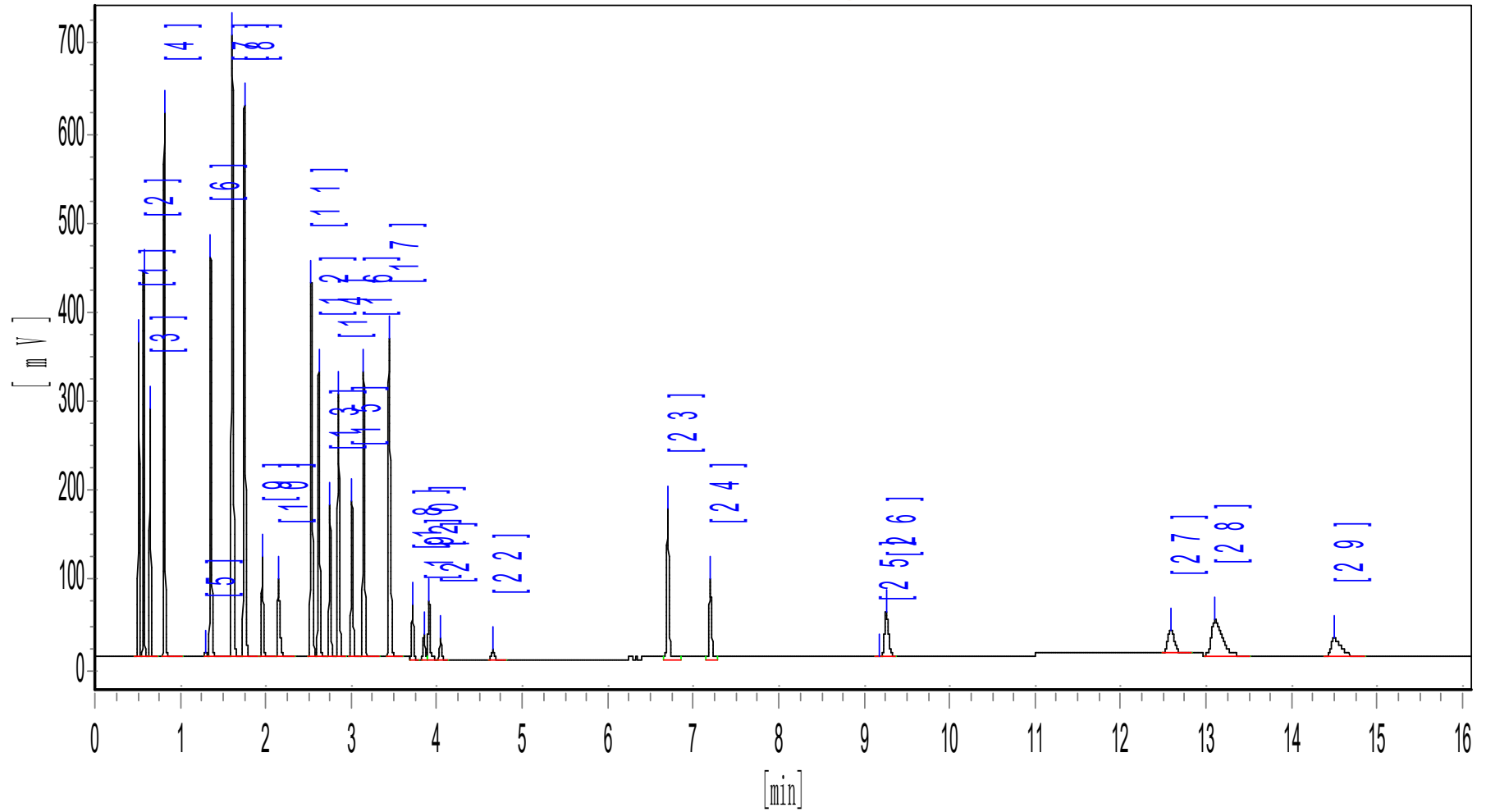
Introduction

Refinery gas streams vary considerably in composition. A detailed determination of hydrocarbons C1 through C6 with reported as a composite peak is usually required in refinery gas analysis (RGA). An exact measure of stream components is essential in achieving optimum product quality control. BTEX is an acronym that stands for benzene, toluene, ethylbenzene and xylenes. These compounds are known pollutants and are typically found near petroleum production and storage sites. Their analysis is included using RGA extended method.

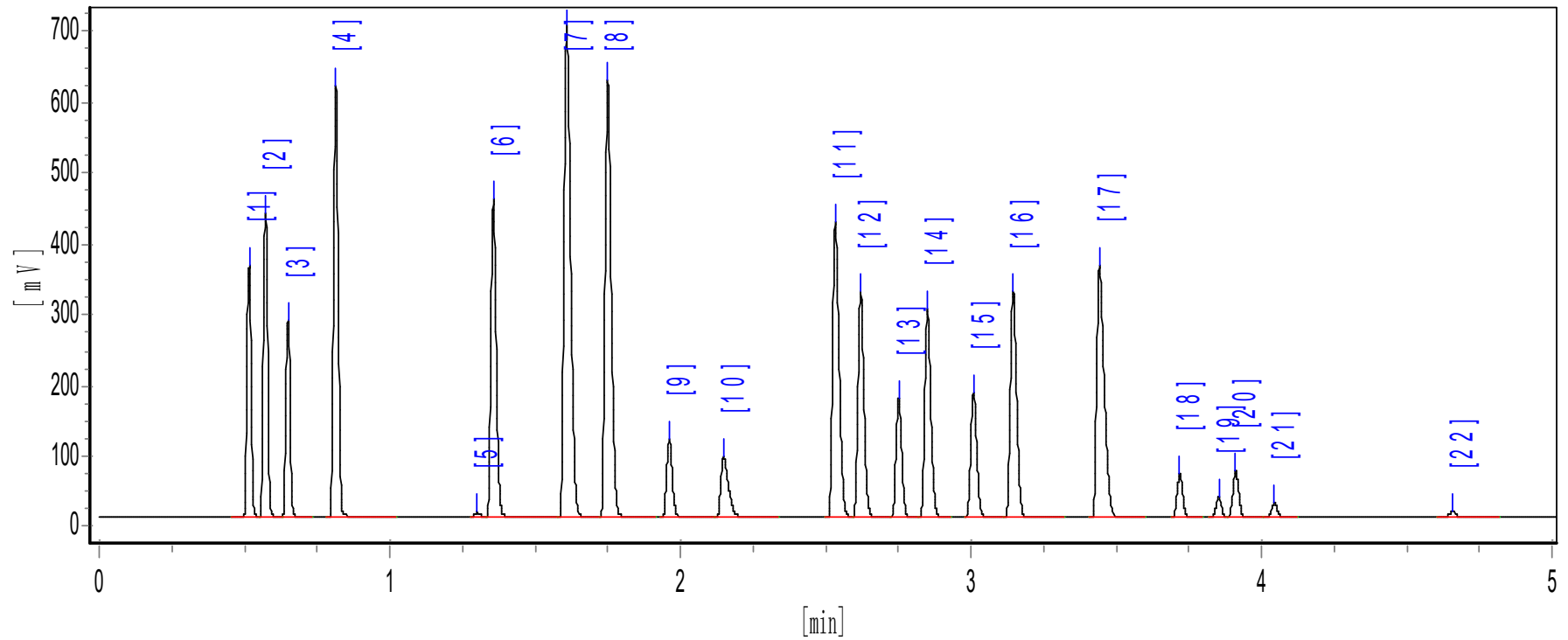
Instrumentation Conditions

- GC: Agilent 5890 w/ FID
- Cat no: 8253-3000A *30m x 0.53mm*
- Oven: 70 °C (1min) 30 °C /min 145 °C (2min) 45 °C /min 200 °C (10min)
- Carrier: Hydrogen, column pressure 5psi
- Inlet: Split, 275 °C, split ratio 10:1
- Detector: FID 325 °C
- Samples: refinery gas and BTEX sample
- Inject volume: 10ul

Chromatogram



Zoom in Chromatogram



Peak Identification

Peak	Compound	Retention Time
1	Methane	0.515
2	Ethane	0.572
3	Ethylene	0.649
4	Propane	0.813
5	Cyclopropane	1.299
6	Propylene	1.355
7	Iso-butane	1.607
8	1-Butane	1.749
9	Propadiene	1.961
10	Acetylene	2.148
11	Trans-2-butene	2.533
12	1-Butene	2.62
13	Iso-butylene	2.751
14	Cis-2-butene	2.85

Peak Identification (continued)

Peak	Compound	Retention Time
15	Iso-pentane	3.008
16	Pentane	3.145
17	1,3-Butadiene	3.442
18	Propyne	3.718
19	Trans-2-pentene	3.852
20	1-pentene	3.911
21	2-Methyl-2-butene	4.045
22	n-Hexane	4.658
23	Benzene	6.704
24	Toluene	7.199
25	Ethylbenzene	9.175
26	m-Xylene	9.259
27	p-Xylene	12.584
28	o-Xylene	13.106

Conclusion

1. FAST refinery gas analysis (RGA) method determines the composition of refinery gas including C5 olefins and n-C6 with a high speed solution in only five minutes on a propriety 30m Al₂O₃ PLOT column and 70°C starting temperature.
2. This analysis is extended to C8 at temperatures 200°C. The analysis of BTEX using the RGA extended method within 15 minutes is achieved.