



Aromatic components in gasoline

PF310

- BTEX, C₉, heavier aromatics and total aromatics in finished gasoline
- ASTM D5580
- Modular iConnect injector and detector
- High uptime



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Aromatic components in gasoline ASTM D5580

This test method determines benzene, toluene, ethylbenzene, xylenes, heavier aromatics, and total aromatics in finished motor gasoline using gas chromatography. Aromatic hydrocarbons are separated from other components without interference, although some higher-boiling non-aromatic compounds may affect the measurement of heavier aromatics. Certain compounds co-elute, while others are separated, and heavier aromatics are treated as a single group. The method applies to typical concentration ranges for these aromatic compounds in gasoline, covering both individual components and total aromatic content across low to high percentages. Results are reported with a precision of 0.01 percent, either by mass or by liquid volume.

Principle of operation

A two-column chromatographic system with a column switching valve and flame ionisation detector is used, see figure 1. A sample containing an internal standard such as 2-hexanone is injected onto a polar precolumn (column 1, TCEP). Lighter non-aromatics are vented as they elute, and the precolumn is backflushed before benzene elutes, and the remaining sample is directed to a second, non-polar column (Rtx-1). Benzene, toluene and the internal standard then elute in order of boiling point and are detected. After the internal standard elutes, the flow is reversed to backflush heavier components to the detector (figure 2).

The procedure is repeated, allowing lighter non-aromatics, benzene and toluene to vent. The precolumn is backflushed before ethylbenzene elutes, and the remaining aromatics are directed to the second column. The internal standard and aromatic components elute in boiling order and are detected. Once o-xylene has eluted, the flow is reversed again to backflush heavier aromatics.

From the first run, peak areas of benzene, toluene and the internal standard are measured. From the second run, peak areas of ethylbenzene, xylenes, heavier aromatics and the internal standard are recorded. The backflush peak in the second run contains only heavier aromatics.

The detector response, proportional to concentration, is used to calculate the amount of aromatics present relative to the internal standard.

Instrument specification

- Thermo Trace GC1600 with iConnect SSL (Split-splitless injector), 10 port diaphragm gas switching valve (rotary valve is optional), micropacked and capillary column, FID
- Chromeleon chromatography data system
- Runtime 30 minutes

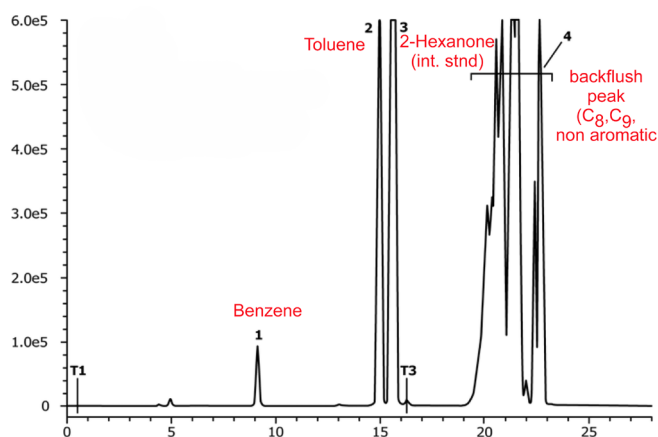


Figure 2 Chromatogram ASTM D5580 analyser: first analysis (see 'principle of operation')

		FrontDetector			
		Benzene	Toluene	2-Hexanone	
1	repro Method 1	Unknown	1274.6592	1325.0558	1774.2793
2	repro Method 1	Unknown	1239.2146	1303.2042	1752.1404
3	repro Method 1	Unknown	1268.6268	1316.3041	1766.5574
4	repro Method 1	Unknown	1275.9759	1330.7667	1788.4714
5	repro Method 1	Unknown	1198.3388	1264.9478	1701.5425
6	repro Method 1	Unknown	1190.5696	1251.0071	1681.7038
7	repro Method 1	Unknown	1225.0728	1289.4681	1735.6654
8	repro Method 1	Unknown	1211.6801	1262.6376	1699.3739
9	repro Method 1	Unknown	1227.4325	1295.6599	1748.7689
10	repro Method 1	Unknown	1189.5304	1260.9296	1702.8354
Maximum			1275.9759	1330.7667	1788.4714
Average			1230.1101	1289.9981	1735.1338
Minimum			1189.5304	1251.0071	1681.7038
Standard Deviation			33.7417	28.9276	36.7352
Relative Standard Deviation			2.74%	2.24%	2.12%

Figure 3 Method repeatability

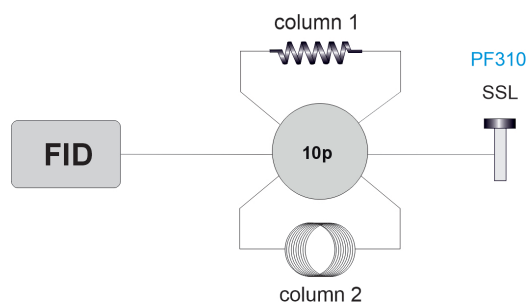


Figure 1 Diagram ASTM D5580 analyser

Ordering information PF31X - ABCDE				
code X	0	1	2	3
GC model, power	1600, 230V	1610, 230V	1600, 115V	1610, 115V

For the selection of options (e.g. GC oven cryo valves, Power plug type and more), see the options table in the order guide.

About GAS

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