

80% Faster GC/MS Analysis of Essential Oils

Using a 10m x 0.10mm ID Rtx®-5 Column

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- 5x greater sample throughput.
- Sharply reduced cost per analysis.
- Resolution and elution orders are not changed.

Essential oils are key components of perfumes, soaps, and other cosmetic products, and they find extensive use in aromatherapy. Because they have high market value, essential oils are subject to adulteration with less expensive impurities. It is, therefore, important to have reliable analytical methods to determine the purity of essential oils.

Typical analysis times for these complex samples, using a 30m x 0.25mm x 0.25µm df Rtx®-5SilMS column and “conventional” GC/MS conditions, are 18 minutes for bergamot oil and 30 minutes for patchouli oil (the analyses are posted on our website). Figure 1 shows these analyses optimized for speed, using a 10m x 0.10mm x 0.10µm df Rtx®-5 column. Analysis times were reduced to approximately 3.5 minutes for bergamot oil and 5.5 minutes for patchouli oil. This 80% reduction in analysis time increases sample throughput by a factor of 5, without sacrificing resolution or accuracy!

Relative to conventional analyses, resolution in the fast analyses is essentially unchanged for bergamot oil, and actually is slightly better for patchouli oil. Because the phase ratio (β) was kept constant at 250, the elution order of the oil components is identical for both fast and conventional analyses, allowing easy peak identification and comparison.

These results demonstrate the potential for greatly increased throughput for essential oils by using a shorter, smaller diameter column. The cost savings make this a desirable improved method for any laboratory.

Rtx®-5 Column (fused silica)

(5% diphenyl/95% dimethyl polysiloxane)

ID	df (µm)	temp. limits	length	cat. #	price
0.10mm	0.10	-60 to 330/350°C	10-Meter	41201	\$275

Rtx®-5Sil MS Column (fused silica)

(Selectivity similar to 5% diphenyl/95% dimethyl polysiloxane)

ID	df (µm)	temp. limits	length	cat. #	price
0.25mm	0.25	-60 to 330/350°C	30-Meter	12723	\$455

Figure 1 Fast GC/MS analysis of essential oils: equivalent to conventional chromatography, 80% faster.

