

Comparison of Geranium Oils on *forte* SolGel-WAX

DESCRIPTION OF ANALYSIS

The yield and relative distribution of components in essential oils varies with plant species, cultivar, agricultural conditions, geographic range and climate. Detection of the dilution or substitution of premium oils with poorer quality natural oil or synthetic oils is of importance to perfumers and other users of essential oils.

Comparative analysis of complex samples from raw chromatographic data is counterintuitive and a more effective technique subtracts the sample chromatogram from a reference chromatogram. The differential chromatogram allows a rapid assessment of batchwise changes in analyte distribution, provided retention times and peak shapes are highly reproducible.

Complete separation of closely related terpenoids is not always effective when using non-polar phases such as 100% dimethylpolysiloxane and 5% phenyl 95% dimethylpolysiloxane.

Complementary separation based on a H-bond accepting phase is particularly useful for resolving fragrant oils with alcohols and other polar components. Polyethylene glycol (or 'wax') phases provide the ideal polarity but are prone to oxidative phase loss which gives poor retention time reproducibility over time.

SGE's *forte* SolGel-WAX™ columns are much more resistant to oxidative phase loss than conventional wax phases, having lower bleed and greater retention time reproducibility with use.

RESULTS

Figure 1a shows the overlaid chromatograms from two samples of Geranium oil. The green trace is the premium priced, high quality Geranium Bourbon from Reunion Island and the red- trace is geranium from South Africa. When one chromatogram is subtracted from the other (Figure 1b), the differences between the two samples are apparent. Low column bleed was important in the identification of the compounds by EI-GC-MS. In this example, the Geranium Bourbon sample contains more menthone (retention time = 14.71 min.), linalool (17.42 min.), and α -terpineol (21.56 min.) than the substituted sample.

The combination of low bleed and resistance to oxygen, make SGE's *forte* SolGel-WAX™ columns an excellent choice for the QC analysis of essential oils.

ACKNOWLEDGMENTS:

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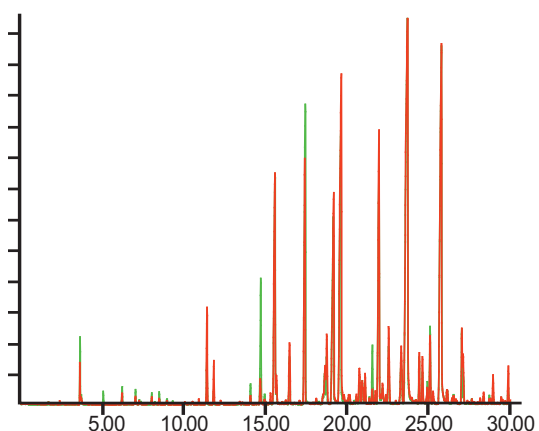


Figure. 1a: Comparison of total ion chromatograms (TIC) for Geranium oils from Reunion Island (green trace) and South Africa (red trace).

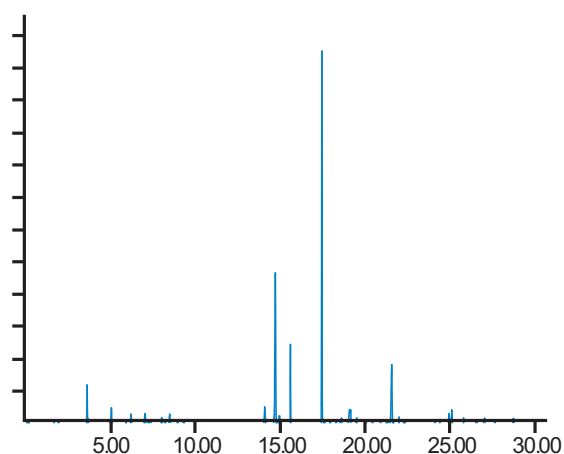


Figure. 1b: Subtraction of the two TIC chromatograms shows the difference between the two essential oils.

EXPERIMENTAL CONDITIONS

Column: SGE *forte* SolGel-WAX™, 30m x 0.25mm x 0.25µm (SGE P/N 054796)

Temperature Program: 60°C for 3 minutes, then 4°C/minute to 220°C

Carrier gas: helium

Flow: 0.6 ml/mn

Injection volume: 0.3µl split ratio 30:1

Injection temp: 250°C

Liner: SGE P/N 092019 single tapered with quartz wool

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