

## Fragrance and Flavor Application

# Turpentine (more than paint thinner!)

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Turpentine oil is the natural product obtained by distilling pine tree materials and is familiar to most of us as a solvent our grandfathers used for oil based paints. The real value of turpentine however is as a source of starting materials for the synthesis of a variety of products. Industrially, turpentine is further distilled into individual components. Turpentine is predominantly  $\alpha$ -pinene and  $\beta$ -pinene, which are used as starting materials for the synthesis of other aroma and specialty chemicals. Typical examples are the large scale production of geraniol from  $\beta$ -pinene and linalool from  $\alpha$ -pinene.

The composition of the oil, especially the amount of  $\alpha$ -pinene and  $\beta$ -pinene, varies depending on a variety of factors including the species of the tree and the region from where the tree was harvested. These

amounts must be determined prior to distillation. Figures 1 and 2 are chromatograms of turpentine obtained with DB-WAX and DB-XLB. With both phases, the  $\alpha$ - and  $\beta$ -pinene are well resolved from other turpentine components. DB-WAX provides a better overall separation of the remaining components in the sample. The key components of turpentine are noted in Figure 1.

Many of the compounds contained in turpentine are chiral, including  $\alpha$ -pinene and  $\beta$ -pinene. The enantiomeric ratio is also dependent on the source of the pine trees. This ratio is important to know as the chirality of the starting pinene determines the chirality of the end product. The enantiomers of both  $\alpha$ -pinene and  $\beta$ -pinene are well resolved by GC with a CycloSil-B column. Figure 3 shows this separation with the enantiomers of both  $\alpha$  and

$\beta$ -pinene. CycloSil-B is an excellent general purpose column for chiral separations and allows for quick determination of enantiomeric purity.

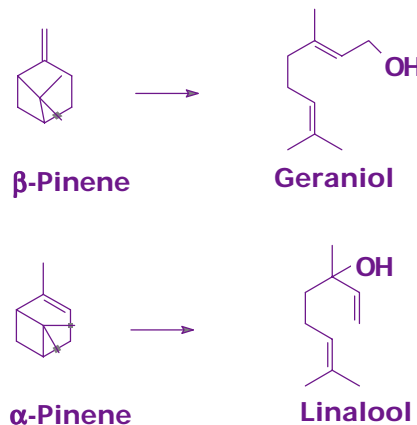
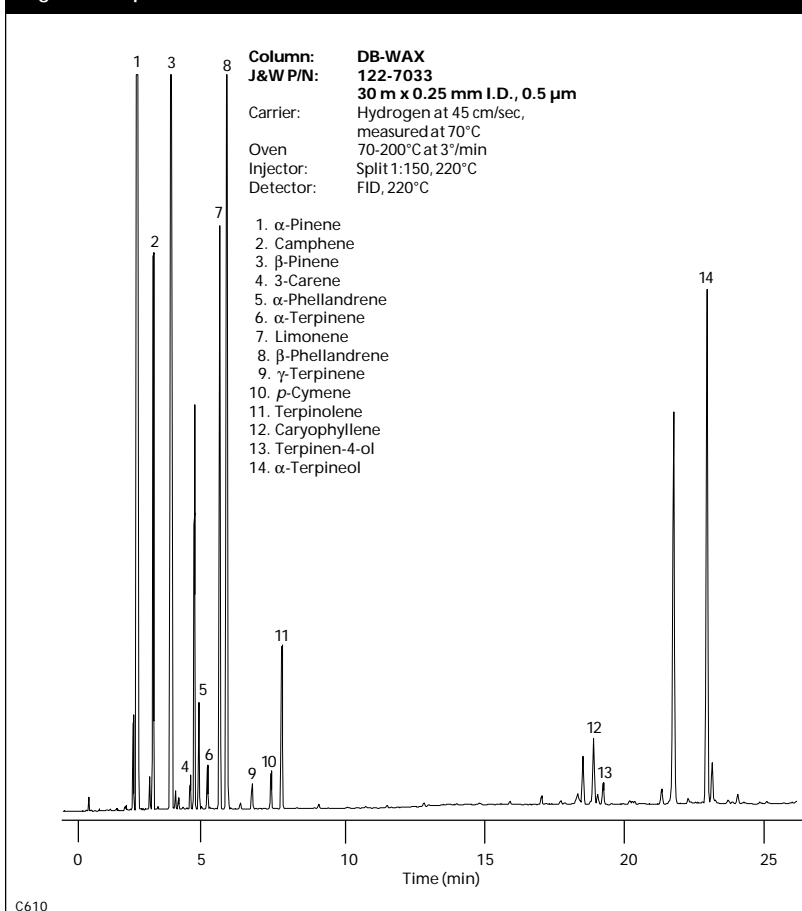


Figure 1. Turpentine Oil on DB-WAX



## CycloSil-B Order Guide

Inner Diameter (mm I.D.)	Length (meter)	Film Thickness ( $\mu$ m)	Temperature Limits (°C)	Part Number (P/N)	Price (\$)	New
0.25	30	0.25	35 to 260/280	112-6632	433	New
0.32	30	0.25	35 to 260/280	113-6632	464	New

## DB-XLB Order Guide

Inner Diameter (mm I.D.)	Length (meter)	Film Thickness ( $\mu$ m)	Temperature Limits (°C)	Part Number (P/N)	Price (\$)	New
0.25	30	0.10	30 to 340/360	122-1231	462	
0.25	30	0.25	30 to 340/360	122-1232	462	
0.25	30	1.00	30 to 340/360	122-1233	462	
0.25	30	0.50	30 to 340/360	122-1236	462	
0.45	15	1.27	30 to 320/340	124-1212*	314	New
0.45	30	1.27	30 to 320/340	124-1232*	550	New

\* No special ferrules required for High Speed Megabore 0.45 mm I.D. columns

## DB-WAX Order Guide

Inner Diameter (mm I.D.)	Length (meter)	Film Thickness ( $\mu$ m)	Temperature Limits (°C)	Part Number (P/N)	Price (\$)
0.25	30	0.25	20 to 250/260	122-7032	403
0.25	30	0.50	20 to 240/250	122-7033	403
0.25	60	0.15	20 to 250/260	122-7061	706
0.25	60	0.25	20 to 250/260	122-7062	706

Partial order guides only. For more part number information call 800-223-3424 or 916-985-7888.

Figure 2. Turpentine Oil on DB-XLB

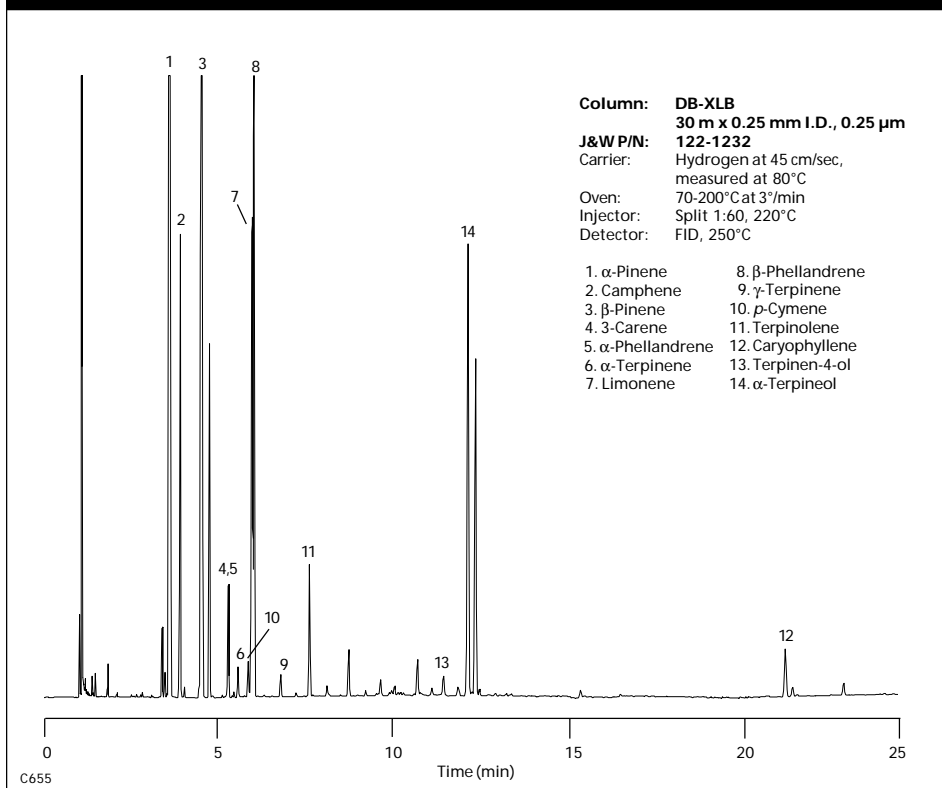
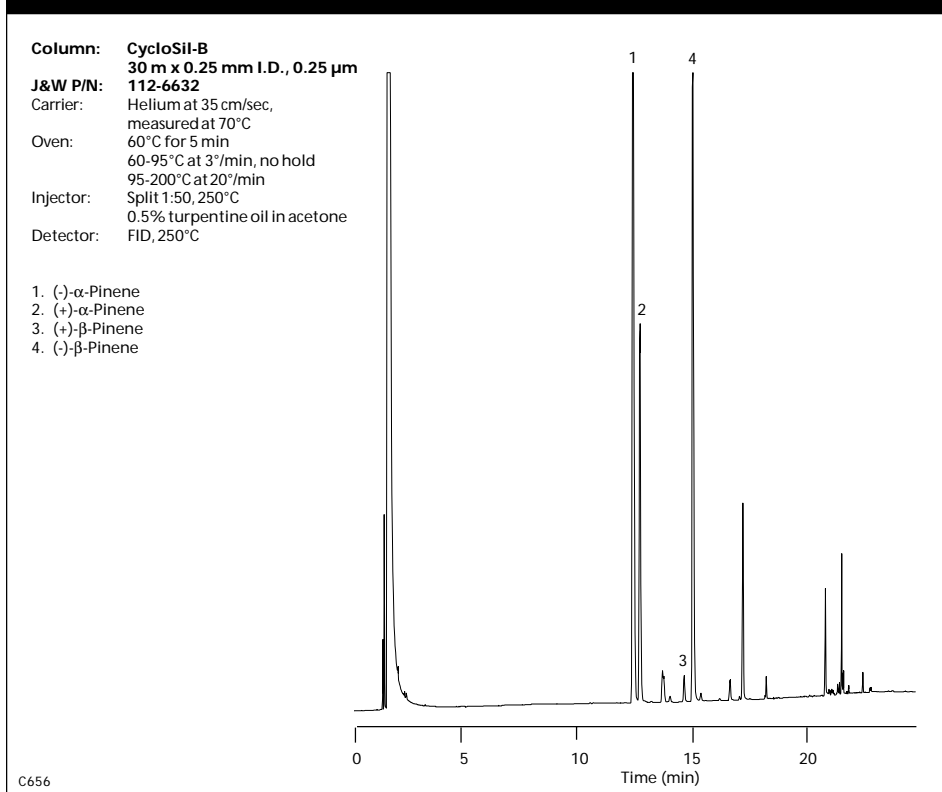


Figure 3. Turpentine Oil on CycloSil-B



Gay Sun and husband Dario at Machu Picchu.