

# Application Note

## Essential Oils

### Introduction

Linalool (Figure 1) and Linalyl Acetate (Figure 2) are the main components of many essential oils that naturally occur in scented plants including lavender. They are used extensively in the food, nutraceutical, cosmetic, insecticide and detergent industries. Uses include flavourings, perfumes in aromatherapy, cosmetics and detergents; Linalool is a precursor in the manufacture of vitamin E and a natural flea repellent in animal shampoos. As the structures are unsaturated hydrocarbons they are readily oxidized in air which may be linked to eczema. To control finished product performance manufacturers use HPLC to quantitatively monitor these components in lavender and other essential oils. Fig1. (S)-(+)-linalool (left) and (R)-(-)-linalool (right)

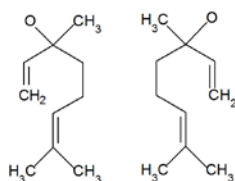


Figure 1.

The S form occurs in coriander seeds and the R form is in Lavender Oil.

Fig 2. (S)-(+)-linalyl Acetate (left) and (R)-(-)-linalyl Acetate (right) Linalyl acetate may have some toxic properties<sup>(1)</sup>.

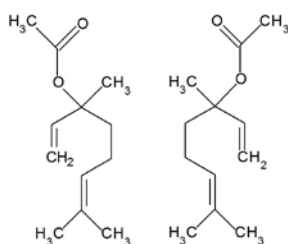
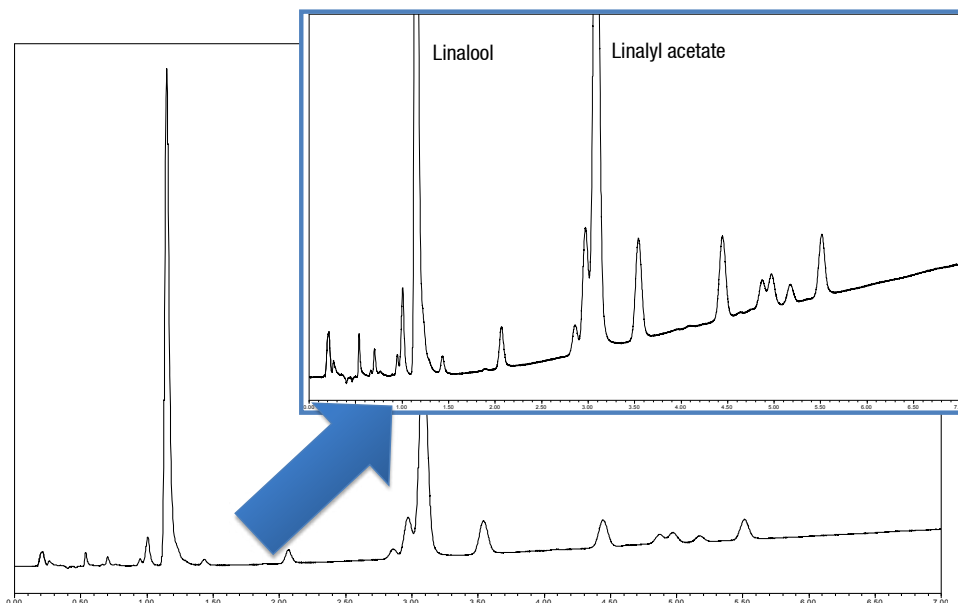


Figure 2.



### Experimental

The customer was keen to improve their productivity and so evaluated the UHPLC 1.7µm Fortis™ C18 particles for their QC screen of lavender oil which only contains the R forms of the Linalool and Linalyl Acetate.

Column: 1.7µm Fortis™ C18 50 x 2.1mm p/n F18-020301

Mobile phase:

A: H<sub>2</sub>O

B: ACN

Gradient: 60-100% in 10 mins

Flow Rate: 0.4 ml/min

Temp: Ambient

Detection: UV 200nm

### Results

It can be seen here that baseline resolution is still achieved for the Linalool after increasing the flow rate beyond optimum to 0.4 ml/min. This is because well packed small particles have a very flat van Deemter curve which means that increasing the flow rate beyond the optimum should not have a detrimental effect on the efficiency of the separation.

### Conclusion

Well packed small particles, demonstrated here with 1.7µm Fortis C18 particles, provide excellent resolution without compromising efficiency in the separation. This has allowed the customer to improve their productivity by decreasing run time whilst obtaining resolution from that of a traditional HPLC methods.

### References

1. Environ Mol Mutagen. 2011 Jan;52(1):69-71. doi: 10.1002/em.20587.

Genotoxicity of lavender oil, linalyl acetate, and linalool on human lymphocytes in vitro.

Di Sotto A, Mazzanti G, Carbone F, Hrelia P, Maffei F.

Source

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