Short Note No. 819/2023

Purification of lavender essential oil by prep SFC (Supercritical Fluid Chromatography)

Purification method of lavender essential oil using Sepiatec SFC instrument with add-on pump

1. Introduction

Lavandula angustifolia, also called lavender, belongs to the lavender plant family. It is used as an ornamental plant or for the extraction of fragrances. Lavender essential oil has many positive health effects. The main compounds of essential oil are volatile compounds.

A prep SFC method for separating various compounds of lavender essential oil using the Sepiatec SFC instrument from BUCHI is presented here.

2. Experimental

Set-up: Sepiatec SFC instrument; prep HPLC column Nucleodur Si 5 um 250 x 4.0 mm

Mobile Phase: A = carbon dioxide; B = ethanol

Mobile Phase condition:

0-11 min: 100 % A

12-21 min: 5 % B

Add-on pump: 2 mL/min ethanol

Samples: Lavandula angustifolia extract in ethanol

Separation: The Nucleodur column Si 5 um 250 x 4.0 mm was conditioned for 5 min at a flow rate of 4 mL/min with 100 % carbon dioxide. The samples were injected automatically using the sample loop and the run was started (run time = 21 min).

The UV detection wavelength was set at 210 nm, the back pressure regulator was set at 150 bar and the column oven was heated to 40 °C.

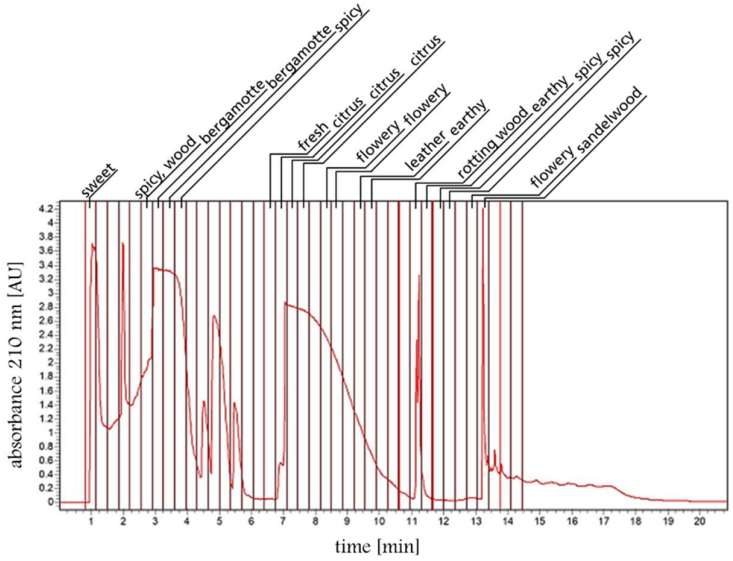
3. Results and discussion

Figure 1 (a) shows the chromatogram of the lavender essential oil purification. Due to a large number of components in the extract, a complex chromatogram with many peaks is obtained. Fractionation allows the many fractions to be classified according to their smell. Through the polar stationary phase (silica), non-polar compounds elute first, having a sweet or spicy, woody smell. Most polar compounds have a flowery or sandalwood taste.

The main part of the extract consists of non-polar volatile components. This allows elution in 100 % carbon dioxide. To prevent precipitation of the sample after the backpressure regulator, ethanol is added by using an add-on pump.

4. Conclusion

Lavender essential oil extract can be purified using the Sepiatec SFC instrument. The collected fractions contain different essential oils with different smells.



(b)

Fig. 1: (a) chromatogram of the Lavandula angustifolia extract purification and (b) picture of the Lavandula angustifolia plant