# EXTRACTION OF SESQUITERPENIC LACTONES WITH $CO_2$ SUPERCRITICAL FLUID AND QUANTIFICATION OF THE EXTRACT BY FTIR SPECTROSCOPY

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## *INTRODUCTION*

Supercritical fluid extraction (SFE) is known to be a rapid and efficient method for the extraction of non polar compounds from plant matrices. The extraction characteristic parameters are the pressure and the temperature of the $CO_2$ supercritical fluid used.

We present here the extraction of a sesquiterpenic lactone from dried plant material and the quantification of the extract by FT-IR spectroscopy.

The aim of this work is to analyze the pressure and the temperature conditions for best extraction. A plan of experiments (Pressure: 200-400 atm, Temperature: 40-80 °C and 15 g $CO_2$) was realized.

## *EXPERIMENTAL*

Supercritical fluid extractions were performed using a Varian Star SFE Autoprep 44. The extraction vessel (1 mL) was packed with plant material (± 200 mg). The Variflow restrictor automatically adjust its orifice to maintain a constant set flow of 1 mL/min of $CO_2$. The extract was trapped by bubbling the $CO_2$ through 5 mL of $C_2Cl_4$ placed in a 10 mL marked flask.

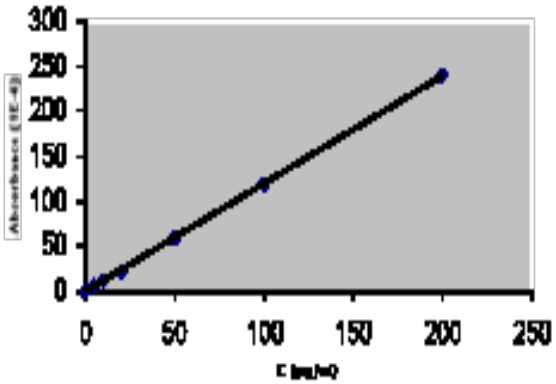


Fig. 1. Linear regression .

For the quantification of the extract, a Perkin Elmer Spectrum GX FT-IR was used. The $C_2Cl_4$ solution was placed in a transmission cell provided with NaCl windows.

After subtraction of the reference solvent spectrum, the sesquiterpenic lactone spectrum was analyzed and quantified by comparison to a calibration curve based on the absorbance of the C=O frequency at 1779 $cm^{-1}$ ($R^2$=1) (fig 1).

## *RESULTS AND DISCUSSION*

The results obtained in the plan of experiments show that the best conditions for extraction are met for a pressure of 347 atm and temperature of 67.8 °C. (fig 2)

Now, experiments are in progress to compare the selectivity of the $CO_2$ supercritical fluid extraction and classical extraction methods.

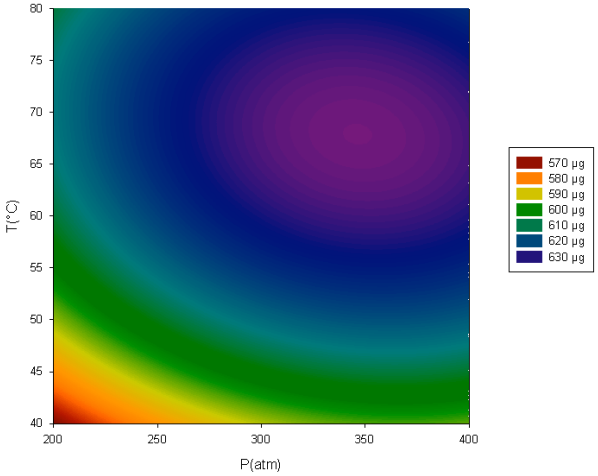


Fig. 2. Modelling of the extraction by the supercritical $CO_2$ (15 g $CO_2$, flow-rate 1 ml $min^{-1}$).