

Supercritical Fluid Application Notes

SFE538: EXTRACTION OF THE FRAGRANCE FROM YLANG YLANG

Introduction

Ylang Ylang is an essential oil extracted from the flowers of the tree *Canaga odorata*. It is used both in fine perfumes, basic toiletries, and aromatherapy. Ylang Ylang is traditionally extracted by steam distillation.

The major objectives of the work described in the referenced scientific paper was to evaluate the potential for using supercritical fluid extraction (SFE) with carbon dioxide, as an alternative to the traditional extraction technique. Also, the effects of CO₂ extraction temperatures and pressures were evaluated. Finally, a study on the effect of flower maturity on the yield and chemical composition of the extracted ylang ylang oil was conducted.

Equipment

Applied Separations Supercritical Extraction Equipment SFE 2

Materials

Flowers of the *Canaga odorata*, forma *genuina*, tree commonly referred to as ylang ylang.

Five maturity stages were identified, three being described:

Stage 1:

The flowers were least mature, the petals colored milky green and showing no signs of red dots.

Stage 3:

The flowers were of moderate maturity, the petals colored greenish-yellow to yellow and red dots visible.

Stage 5:

The flowers were of highest maturity, the petals limp and shriveled and dark brown with no visible spots.

Liquid CO₂ cylinder

Equipment



Applied Separations Spe-ed SFE 2

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Extraction Conditions

Extraction vessel: 100 mL
Sample: 28 g
Pressure: 300 Bar
Temperature: 45 °C
CO2 Flow Rate: 2,5 L/min (gas)
Collection: 60 mL pre-weighed vial
Dynamic time: 15 minutes

Analysis: GC-FID

Results

GC Results for the Variation of Ylang Ylang
Oil Composition with Flower Maturity .

Component	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Benzyl acetate	4.01	4.55	3.07	1.93	0.34
Benzyl benzoate	13.21	11.92	12.32	13.62	12.45
Eugenol	21.28	21.58	21.92	20.40	20.17
Farnesol	0.51	0.64	0.60	0.97	1.16
Geraniol	0.02	0.02	0.04	0.02	0.03
Nerol	1.31	1.39	1.39	1.38	1.73
Nerolidol	0.00	0.61	0.06	0.05	0.09

Conclusion

Supercritical CO2 extraction of volatile fragrance compounds from ylang ylang flower is a feasible extraction technique. The optimum conditions for the supercritical fluid extraction of ylang ylang were shown to be 300 bars and 450C, giving the highest yield and good quality. It appears that Grade 3 maturity flowers were shown to yield the highest quality of ylang ylang oil.

References

McGaw DR, Watson M, Paltoo V, ChangYen I, Grannum J. A comparison of methods for the extraction of the fragrance from ylang ylang. Proceeding of the 6th ISSF. Pp. 2003 Apr:23-8.

Skeene R, Maharaj S, McGaw DR, Farrell DM. Industry in Developing Countries.