

# Analysis of Somalia Incense essential oil by gas chromatography and physicochemical measurements

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## Introduction

Incense is a tree found in the Somalia desert. When it is subjected to an outside aggression, such as incision, it secretes a resin, which is transformed in a gum when drying. With this gum, it is possible to extract the essential oil of incense, by a hydro-distillation method.

## Experimental methods

The gum is ground to powder and mixed with 10 volumes (in mass) of water. This sample is shaken and heated during 15 hours. The vapor contains oil molecules, and will be condensed before decanting through the funnel. After decantation, the oil phase is recovered and dried with anhydrous sodium sulfate.

GC analysis aims to identify the oil components and their percentages. These must be within the specification, such as AFNOR or ISO. If the percentage of the component is not included in the specification, the oil cannot be sold. The physicochemical analyses performed are relative density, rotator power and refractive index all at 20°C. These measurements are characteristic of only one essential oil: it is possible to detect a fraud if we identify a variation. Finally, an odor control is made to detect an unattractive smell, such as acid or burnt.

## Results

Somalia incense is not submitted to AFNOR or ISO specification. That is why; the company chose an internal specification in order to ensure the best quality: the "Albert VIEILLE" specification.

The results obtained by chromatography (Table 1) show that most components are not included in the standard imposed by the company.

## Conclusion

The results show that the incense analyzed in the lab does not correspond to the quality given by the industry: the quality "grade 1", where gums are selected and graded. It is possible that the supplier sold a lower quality, where the gums are neither selected nor calibrated.

COMPONENT	INTERNAL SPECIFICATION	% IN OIL
ALPHA THUYENE	0.5 to 4 %	0.99
ALPHA PINENE	28 to 40 %	42.01
SABINENE	2 to 7 %	6.79
MYRCENE	5 to 10 %	4.09
LIMONENE	11 to 20 %	6.28
PARA-CYMENE	2 to 5 %	1.51
BETA CARYOPHYLLENE	1 to 6 %	0.80
INCENSOL	0.15 mini	0.20

**Table 1:** Main components of Somalia incense

After, the physicochemical measurements are given in the internal specification (Table 2).

Rotary Power at 20°C	Refractive index at 20°C	Relative density at 20°C
-20° to 0°	1.4690 to 1.4920	0.8600 to 0.8900
-4.4	1.4709	0.8728

**Table 2:** Physicochemical measurement of Somalia incense

For the odor control, the smell is woody, warm and slightly gruel (characteristic of a fresh distillation). This is specific of Somalia incense.