FARMAKOGNOZİ PRACTICE II 2017-2018 spring semester

OLEUM THYMI
TURPENTINE OIL
COLOPHONY

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OLEUM THYMI (EP 2008, BP 2000)

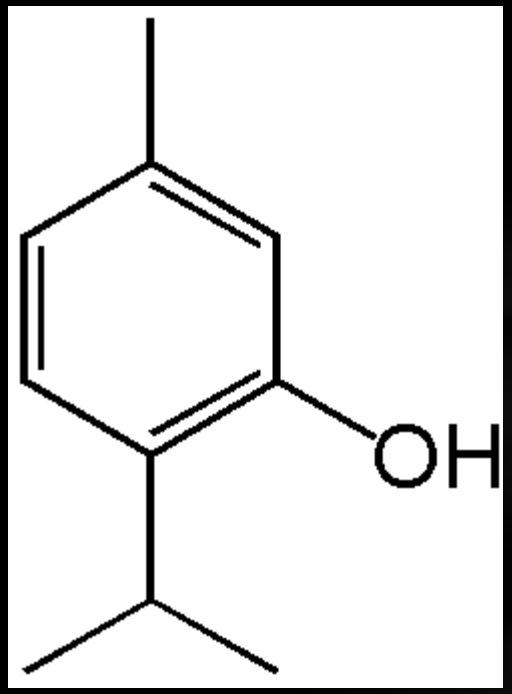
- **Oleum Thymi (essential oil of thyme) is obtained from the aerial parts of *Thymus vulgaris* which is a member of Labiatae familiy . The major components of the oil are thymol and carvacrol which are phenolic compounds.**
- **It is documented in EP 2008. The oil is clear, yellow or brown and has a characteristic odour.**
- **The assay of the oil is conducted using TLC and GC according to the monograph in EP 2008.**

According to the results of GC analysis in European Pharmacopoeia , the content of the essential oil is given below;

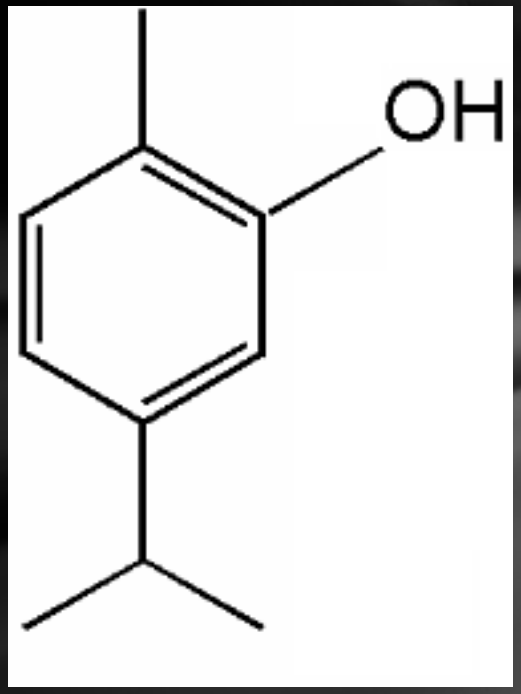
- ✓ β-myrcene : % 1-3
- ✓ γ-terpinen : % 5-10
- ✓ *p*-cymen : % 15-28
- ✓ lynalol : % 4-6,5
- ✓ terpinen-4–ol : % 0,2-2,5
- ✓ thymol : % 36-55
- ✓ carvacrol : % 1-4

According to the analysis given in EP 2008;

- ➢ relative density : 0,915-0,935
- ➢ refractive index : 1,490-1,505 olarak verilmiştir



THYMOL



CARVACROL

ANALİZLER

- **Determination of Purity:**

  Clearly soluble in the mixture of absolute alcohol and water. 99 % v/v EtOH

- **Quantification:**

Cassia flask is used.

Cassia flask; a flask which has a bulb of 100 ml and a graduated neck.

- 50 ml of the mixture of 15% NaOH and water (35:75) is added to 5 ml essential oil in the flask. The mixture is shaked vigorously and left for some while.

- The mixture of NaOH and water is added to the flask until the line seperating the oil and water reaches the beginning of the graduated neck of the flask. The amount of the oil is recorded.
- The loss of the oil gives the amount of phenolic compounds which are soluble in water, because in alkaline media, phenolic compounds yield phenolates which are soluble in water.

The oil used for the experiment is 5 ml. In case the recorded value of the loss of the oil is 3 ml;

5-3 = 2 ml phenolic compounds

5 ml of oil 2 ml phenolic compounds

100 x

x = 40

40% phenolic compounds

The minimum value for the phenolic content is 20%.

- Oleum Thymi is used for the preparation of aromatic baths and due to its antiseptic effect.

TURPENTINE OIL (EP 2008, BP 2000)

- Turpentine oil is an ssential oil obtained by steam distillation from the oleoresin of *Pinus* sp. It is a clear, colourless liquid with a characteristic odour.

- Resins occur as a result of physiological conditions or pathological factors and are used as active components or excipients for pharmaceuticals.
- Resins are found with some components in plants

resin + essential oil = oleoresin

resin + gum = gomresin

resin + gum + essential oil = oleogomresin

- Turpentine oil is documented in EP 2008. The assay of the oil is conducted using TLC and GC according to the monograph in EP 2008.
- According to the results of GC analysis in European Pharmacopoeia , the content is given below;

✓ α-pinene	: % 70-85
✓ camphene	: % 0,5-1,5
✓ β-pinene	: % 11-20
✓ β-myrcene	: % 0,4-1,5
✓ limonene	: % 1-7
✓ β-caryophyllene	: % 0,1-3
✓ caryophyllene oxide	: max. 1,0

According to the analysis given in EP 2008;

- relative density : 0,856-0,872
- refractive index : 1,465-1,475

- Turpentin oil is dissolves substances such as wax, far and rubber, therefore it is used as dissolvent in industry.
- It is also used in the preparations for hair.

ANALYSES

- **Solubility in Alcohol**

Completely soluble in 90% and 96% ethanol.

- **Weight per ml: The ratio of the weight of a liquid fills the pycnometer at 20˚C in grams to the weight of water fills the pycnometer at 20˚C**

weight of pycnometer (empty) = m_1
pycnometer + oil = m_2
pycnometer + water = m_3

$$\text{Weight per ml} = \frac{m_2 - m_1}{m_3 - m_1}$$

Specific Weight: The ratio of the weight of a substance at specific temperature and volume to the weight of water at specific temperature and volume.

Density: The mass of a unit volume of material. The weight of 1 ml substance at 20 ^{o}C.

COLOPHONY (Colophonium)

(EP 2008, BP 2000)

- **Colophonium is the residue remaining after distillation of the volatile oil from the oleoresin obtained from various species of Pinus.**
- **It comprises resin acids. Among these resin acids, abietic acid is the one which is found in larger quantitiy.**
- **Translucent, pale yellow of brownish-yellow, anguler, brittle, glassy pieces.**

ANALYSES

- **Solubility:**
  - ✓ **Solubility in water, ethanol, ether, carbon disulphide and petroleum ether**
  - ✓ **Insoluble in water,**
  - ✓ **Soluble in 96% ethanol, ether, carbon disulphide**
  - ✓ **Partially soluble in petroleum ether.**

➢Identification:

A-) Colophonium is dissolved acetic acid anhydride (10 ml)

+ 1 drop of H_2SO_4

RED-PURPLE

The colour immediately turns into violet.

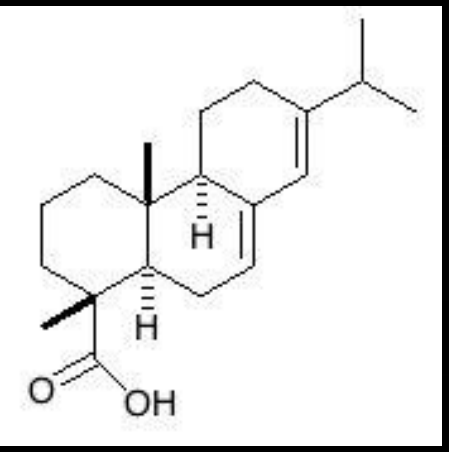
B-) Colophonium + petroleum ether (dissolved)

↓

+ 0.5 % Cu-acetate solution

The phase of petroleum ether turns into **GREEN**

Abietic acid + Cu – acetate → Copper abietate (Green)



- **Acid Value:** The mass of potassium hydroxide (KOH) in milligrams that is required to neutralize one gram of free fatty acids in 1 gram of oil.

- A gram (1,???? g) colophonium is dissolved in 96% ethanol. The solution is titrated with 0.1 N KOH usinf phenolphtalein as indicator until pink colour is formed.

The amount of KOH consumed for titration: *t* ml

$$A.V. = \frac{t \times 0{,}00561 \times 1000}{A\ (g)}$$

1000 ml	1 N KOH	56,1 g
1 ml	0,1 N KOH	0,00561 g
t ml	0,1 N KOH	y g

y= *t* x 0,00561 g

A g sample	*t* x 0,00561 g KOH
1 g	?

$$? = \frac{t \times 0{,}00561}{A} \times 1000$$

mg