

EXPERIMENT NO.14

ISOLATION OF VOLATILE OIL BY HYDRO-DISTILLATION METHOD USING CLAVENGER'S APPATATUS AND DETECT THE PHYTOCONSTITUENTS BY TLC METHOD

Aim To isolate volatile oil by hydro-distillation method using Clavenger's apparatus and detect the phytoconstituents by TLC method

Requirements (Apparatus)

Beaker, Stirrer, Measuring Cylinder, Clavenger's apparatus Volatile oils are complex mixtures of odorous principles found in various plant species. They are called volatile because they evaporate at room temperature, but they are also referred to as ethereal oils or essential oils. They are mixtures of from ten to hundreds of components. Common properties of volatile oils:

They have a characteristic, usually pleasant odour, and they are usually colourless or pale- yellow, except for chamomile, absinth and yarrow oil (blue or greenish-blue). Their density is usually less than 1, except for clove, cinnamon and mustard oil. During their long-term

storage, volatile oils may oxidize and resinify, which may result in a change in their colour or odour. To prevent this, they should be kept in a dry environment, in tightly-stoppered, full (not partly empty), dark glass containers. Volatile oils are almost immiscible with water, but they have a slight solubility in it, which is enough to form aromatic waters. On the other hand, they are completely soluble in ether, alcohol and most organic solvents. Determination of volatile oil content

The clavenger apparatus consists of the following parts (See Fig.). The apparatus described below is recommended but any similar apparatus may be used provided that it permits complete distillation of the volatile oil. All glass parts of the apparatus should be made of good quality resistance glass. Pharmaceutical

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Calculation

$$\% \text{ Yield} = \frac{2.7}{5.0} \times 100$$

$$= 0.54 \%$$

$$\text{Rf value} = \frac{4.0}{5.6} = 0.68$$

(b)

significance of aromatic drugs is due to their odorous principle that is volatile oils such crude drugs are standardized on the basis of their volatile content

PROCEDURE

The determination of volatile oil in a drug is made by distilling the drug with a mixture of water and glycerine, collecting the distillate in a graduated tube in which the aqueous portion of the distillate is automatically separated and returned to the distilling flask and measuring the volume of the oil. The content of the volatile oil is expressed as a percentage v/w. A suitable quantity of the coarsely powdered drug together with 75 ml of glycerine and 175 ml of water in the one litre distilling flask and a few pieces of porous earthen ware are also put in the distilling flask, which is then connected to the still head. Before attaching the condenser, water is run into the graduated receiver, keeping the tap open until the water overflows. The tap is then closed and the condenser attached. The contents of the flask are now heated and stirred by frequent agitation until ebullition commences. At the end of the specified time (3 to 4 hours) heating is discontinued, the apparatus is allowed to cool for 10 minutes and the tap is opened and the tube lowered slowly; as soon as the layer of the oil completely enters into the graduated part of the receiver the tap is closed and the volume is read. The measured yield of volatile oil is taken to be the content of volatile oil in the drug and calculate the percentage yield accordingly.

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IDENTIFICATION BY TLC

Volatile oil is identified by thin layer chromatography by using silica gel G as stationary phase and Ethyl acetate: toluene (93:7) as mobile phase. After drying the TLC plate, the spot was detected after spraying vanillin- sulphuric acid solution. Calculate the R_f value by using formula.

RESULT-

The % yield of volatile oil in the drug was found to be 0.54%.
The extracted volatile oil was identified by TLC method
of value is 0.68