Clevenger device

The plant material is cut into small pieces and then subjected to financial distillation other than a device for extracting essential oils called Clevenger (Fig. 06). Financial distillation depends on the ability of water vapor to carry the essential oil of the plant. A certain amount of the plant is immersed in distilled water, which is inside a glass ballon flask (liter capacity), provided that the latter is not completely filled, working at most two-thirds of the volume of the flask, in order to avoid exceeding the boiling area and the eruption of the mixture. After boiling under the influence of a heat source, the water vapor becomes saturated with the essential oil of the plant and is transferred with it through vertical tubes that pass through a cooling device where the process of condensation occurs to the seas and small droplets are formed that accumulate in a tube containing distilled water 41. Because of the difference between the density of distilled water and the essential oil, the oil remains floating above The surface of the distilled water is to the bottom, the distillation process takes three hours after boiling. The essential oil is collected in a tightly closed and opaque glass bottle. The amount of water that may remain at the bottom of the bottle is disposed of by sodium sulfate. The bottle is kept away from light and at a temperature between (4-6)

Extraction of essential oils according to the distillation technique by means of a calvinger device

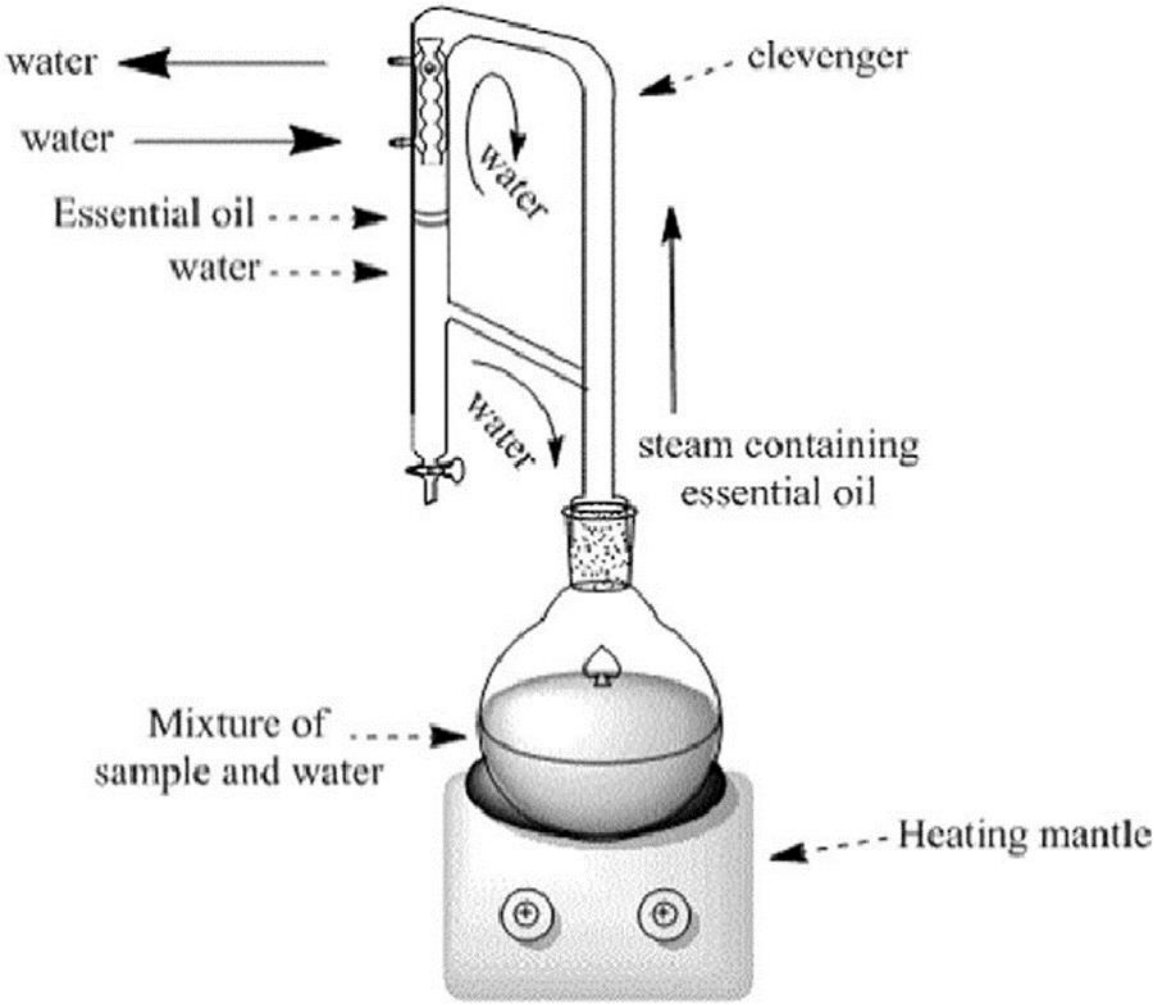
The essential oils were extracted by hydro-distillation method using a Clevenger equipment, by placing a quantity of 100g of dry ground plant sample (unripe fruits dried in the shade) in a 1000 ml glass flask, to which a quantity of distilled water (600 ml) was added until the entire sample was immersed. The extraction process continued for 18 hours, after which the essential oil was separated from the aqueous extract by a 1000 ml separating funnel using chloroform solvent in several batches. Evaporater at oC 40 to a volume of 3ml and then leave the solution until complete evaporation of the solvent.I repeated this process for the remaining four samples, the sample of sun-dried immature fruits - the ripe fruits dried in the shade and in the sun - the flower sample dried in the shade. With a color ranging between pale yellow and opaque golden for the five samples, until

the OC analysis was performed, the oils were then kept in small, opaque glass tubes that were sealed tightly in the refrigerator at a degree Celsius. 4°C temperature

Studying the chemical compounds of essential oils using a kelvinger apparatus

Samples were analyzed by injecting 1µl of oil into a Shimadzu GC-17A/QP2010 GC/MAS using an OV-5 fused silica capillary column (30m*0.25mm, id0.25µm) and a carrier gas of helium. With a flow rate of 0.89ml/min, the solvent used was hexane.The injector temperature was set at 250oC and at a pressure of 100kPa.The heat program was started at 40oC, which is the temperature of the furnace shaft and was kept at this temperature for 5min and then raised to 280oC at an average rate of 0.89ml/min. 10 oC per minute and this final temperature was maintained for 5 min after which it was increased from oC 280 to oC 290 by 2 oC per minute and the temperature was fixed there for 12 min.Mass spectra were recorded from m/z (40-350) with a time ranging between 3 min. -20) at oC 250. Page 26 of 71 After that, the chemical compounds of the oils extracted from the studied samples were identified by comparing the mass spectra of each peak with the mass spectra of the available libraries within the device. Calculating the percentage of essential oils extracted using the Clevenger device.

After extracting the essential oils from ripe and immature fruits (dried in the shade and in the sun) and from flowers by water distillation using a Clevenger equipment, the essential oil was separated from the aqueous extract using chloroform solvent in several batches. The organic layer containing the essential oil was isolated and dried from moisture, then the solution was concentrated to a volume of 3ml, then the solution was left until the complete evaporation of the solvent, after that the remaining oil was weighed and its percentage was calculated.


water
water
Essential oil
water
clevenger
water
water
steam containing
essential oil
Mixture of
sample and water
Heating mantle