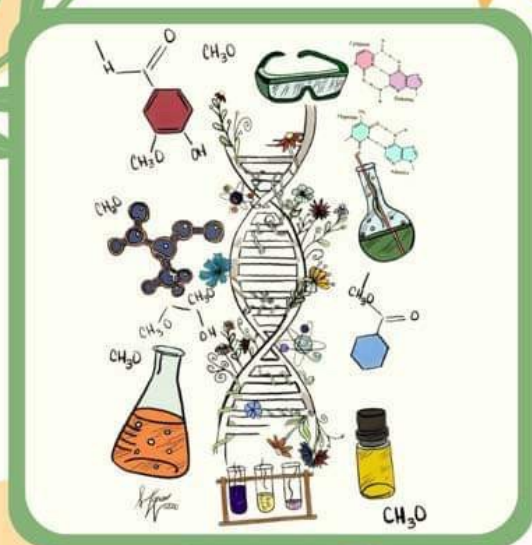


تفريغ عقاير

اسم الموضوع: تفريغ محاضرة الأحد

CH₂. ٧/٢١

إعداد الصيدلاني /ة: سيماء المسلوفي



لجان الرفعات

الهدف الرئيسي أحافظ عليها من
الحفظ الممنوع O₂

Preservation

التحلل

- Preservation aims at limiting decomposition processes as much as possible.
- The plant material must first be preserved so that the active compounds will remain unchanged during transport and storage. النبات لا يتم تحفظ بشكل صحيح حتى أحافظ على المواد الفعالة
- **Factors** that might affect the quality of crude drugs:
 - 1. Light (Light ↑ Free radicals), So Amber glass is used to avoid exposure to Light.
 - 2. Oxygen
 - 3. Attacks by insects (this can be achieved ^①by using methyl bromide or heating up to 65C)
 - 4. Low Temperature ^②

Preservation of plant materials

- After collection, the plant material must first be preserved **so that the active compounds** will remain unchanged during transport and storage.
- The most common method for preserving plant material is **drying**. Living plant materials have high water content:
 - ☐ Leaves may contain 60-90%
 - ☐ Roots and rhizomes 70-85%
 - ☐ Wood 40-50% Wood + Bark have Low water Content
 - ☐ Seed contains 5-10%

عندها أقل ← كمية ماء النبات
صعب تتحفظ ← مهمة حياة
النبات

[لديكم مدة
صلاحيتم طويلة]

Drying of crude drugs

- **Aim of drying:**

- 1. Remove moisture since it favors spoilage due to microbial growth

- 2. Prevents ^{الحفن} molding

الإنزيمات تعمل بالوسط المائي [بجبر أكسدة]
وبالتالي لمنع النشاط الإنزيمي في طريقتين



- 3. Prevents enzymatic action

- 4. Prevents bacterial action.

- 5. Prevents chemical changes

- 6. ^{تثبيت} Fixes cost.

- 7. To facilitate their grinding. → لما تكون جافة يكون أسهل تكسيرها وطحنها

- 8. To reduce their size and weight.

Drying medicinal plants?

→ So we don't lose volatile oils.

- 1. Drying in open air: in sun and under cover sheds at night or during wet weather, e.g. clove, cinnamon,...

أصبح من تجفيف
الرياح الطلق

درجة حرارة قمت
للزهور والأوراق
المحافظ على اللون

- 2. Artificial oven drying (Oven-drying is more rapid than air-drying, controlled temp. In oven – drying, flowers and leaves are usually dried below 60° C to retain color, while roots and barks may be dried at slightly higher temperature.

- 3. Vacuum drying: in oven, rapid and at low temp.

- 4. Lyophilization (Freeze Drying) used for biological fluids, enzymes, proteins and royal jelly. No heat involved.

التجفيف
بالبريد

من الأمثلة
- Powder milk.

Chilis drying



- **In order to keep crude drugs for longer periods:**
- 1. It is essential to store them in a dry condition in carefully closed containers.
- 2. It is also advisable to exclude light, because - even if it does not affect the active constituents - it almost always causes changes in the appearance of the drug, especially loss of color.
- 3. It is also necessary to protect the drug against insect attack.

Surface area S_o efficiency of extraction

شئ الهدف
الرئيسي منه ؟

Grinding (size reduction of plant materials):

- the first operation that must be performed after drying is grinding of the plant material to a powder of suitable particle size.
- Large particles take a longer time for complete extraction than small ones and large differences in particle size thus slow down the extraction process.
- The purpose for powdering the plant material is to rupture its tissue and cell structures so that its medicinal ingredients are exposed to the extraction solvent.
- Furthermore, size reduction maximizes the surface area, which in turn enhances the mass transfer of active principle from plant material to the solvent.

(٣) الاستخلاص من **Powder** أفضل من
الاستخلاص من **Leaves** مباشرة.

(٤) لا حجم = كفاءة = نقل المادة
الفعالة.

ملخص
(١) الجزيئات الأكبر بتؤخذ وقت أكبر للاستخلاص لهيك
توحيد الحجم بين الجزيئات وح يسرع ويزيد من كفاءة الاستخلاص
(٢) كل ما كان الطحن أفضل مذهب الاستخلاص بوصول لكل الجزيئات

Preparation: Grinding of crude drugs

First step in preparation is grinding of the plant material to a powder of suitable particle size.

Grinding decreases the particle size and increase the surface area.

1. Mortar and pestle.

2. Hammer mill a common type for grinding crude drugs.

3. Knife mill is useful for production of low-dust powders of leaves, barks and roots for subsequent percolation or maceration.

خطوات من Extraction

غبار أفل



➤ Machines are available for grinding crude drugs



Mortar and pestle



Hammer mill, Knife mill



Electrical blender

التخل والغربلة

الرسف

Sieving and Garbling

① التخلص من المواد غير المرغوب فيها
② التأكد أنه الجزيئات نفس الحجم

- Simply it is removing of external matter
- In garbling the material is passed through a sieve of suitable mesh size giving two fractions. The remaining fraction consists of coarser particles which are returned to the mill for continued grinding.

جزيئات
أخبر
(أخشن)

Remaining
Fraction



Storage

- Well-dried and well-stored plant materials can be used up to 6 months after the collection.
- Discard the plant materials if there are molds or other signs of decay.
- Use glass, ceramic pot as cooking utensils, stainless steel pot can also be used.
- Plastic may be used but not for storing crude drugs with volatile oil. → لأنه البلاستيك ممكن يحترق المواد المتطايرة ويخسرهما
- Do not use pots made of aluminum, iron, tin or other metals as these will leach into the tea. →
- Use pure water (distilled water). → ليس مش مناسب لتخزين الشاي؟

← لأنه يملوا [Leaching]

يعني مع الوقت ينزل جزء منهم على المادة، والمخزنة (الشاي).

Extraction and Separation of natural drugs

➤ INTRODUCTION

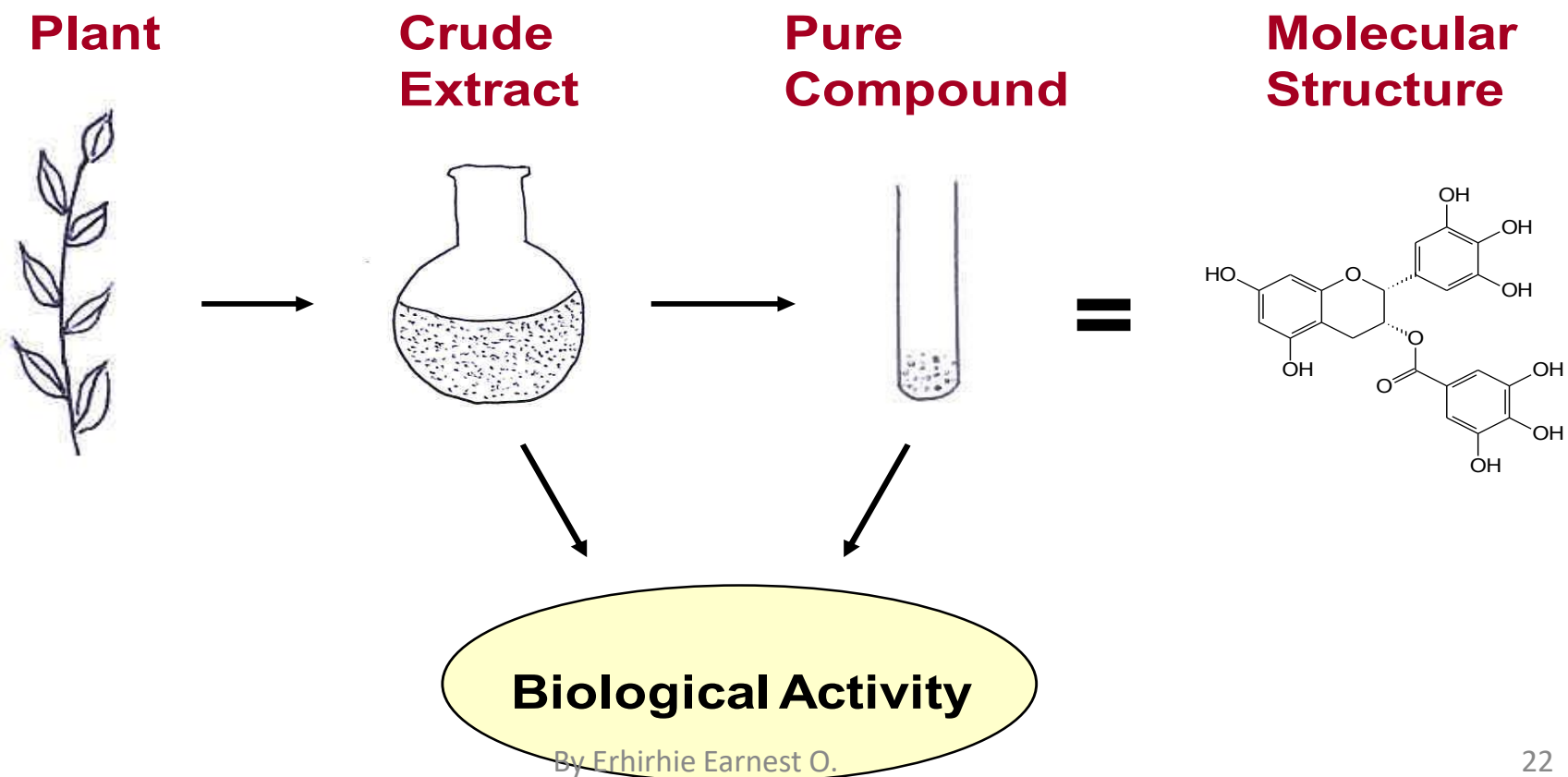
Extraction: This is the separation of medicinally **active portions** of plant from the **inactive components** by using **selective solvents** in standard extraction procedures.

المادة المفصولة

Extract: This is a preparation of **crude drug** which contains **all the constituents** which are **soluble in the solvent** used in making the extract.

➤ INTRODUCTION

From Plant to Drug



➤ BASIC PRINCIPLE IN EXTRACTION

Plant constituents are usually contained inside the cells.

Therefore, The solvent used for extraction must diffuse into the cell to dissolve the desired compounds.

الاستخلاص : هو عملية فصل المادة الفعالة عن النبتة .

← عادة المواد الفعالة في النبات موجودة داخل الخلايا ، لذلك لا بد من استخدام **Solvent** يكون قادر على المرور لخلايا النبتة وإذابة هائي المواد .

Extraction and Separation of natural drugs

- The commonly employed technique for removal of the active substance from the crude drug is called **extraction**

• *على ذيفقة* The forms in which plant drugs are used:

1. Fresh plant material
2. Dried plant material
3. Acellular products like Volatile oil, Resins, and fixed oils
4. Galenical preparation and extracts
5. Processed extracts



1. Fresh plant material

- Predominantly used in folk and herbal remedies.
- Fresh plant material is often required by the
 - flavor industry and is also used by the
 - perfumery industry where the volatile oils from fresh materials , such as flower petals, are highly prized and highly priced.

2.Dried plant material

The method of drying depends on the ^①nature of the
plant material and ^②the active constituents. Plants
containing volatile oils lose much of their aroma if
dried at elevated temperature and, if required for
their volatile content, must be dried extremely
carefully. المواد المحتوية على زيوت طيارة تجفف بدرجة منخفضة الحرارة

Plant material obtained in the tropics is normally sun-dried, often being bleached during the drying process.

Processed extraction

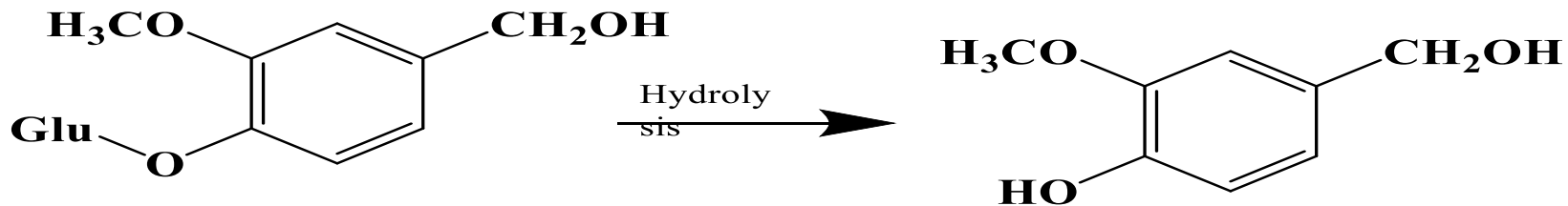
- If the active constituents are not present in a free form but need liberating by enzymatic processes, care must be taken not to dry the plant too quickly. For example, vanilla pod, the source of natural vanillin, contain the phenolic glycosides glucovanillic alcohol. During the curing process, which involve slow drying, the glycoside is enzymatically hydrolysed and oxidized to vanillin.

Vanilla *Vanilla planifolia*



Some active constituents need to be processed (slow drying is allowed)

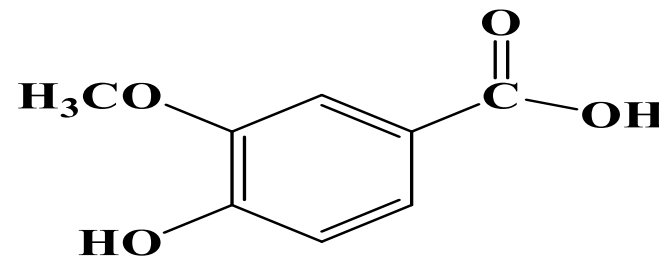
Liberation of active vanillin by enzymatic process from *Gentiana Luten* and Vanilla pod



Glucovanillic acid
Not active
Glycoside

Vanillic alcohol
Not active

Oxidation



Vanillin

السلايد مهمة
والأمثلة مهمة

3. Acellular products

They are plant isolates like volatile oil, balsams, resins and fixed oils.

↓
رائحته نقادة

Methods to extract acellular products (Volatile oils):

أبرز مثال على تقديده
هو في صناعات النفط

- 1. **destructive distillation**: wood of Scotch pine (used for dermititis)
- 2. **Steam distillation using Clavenger tube**: plant material is heated with water and steam is passed through the mixture and condensed. This needs a round-bottomed flask دورق that contains water or alcohol (usually water), the plant is inserted inside it with the water, then it's attached into a condenser, also a collecting tube should be there to collect the extracted oil, distillation also requires a heat source, **if the treated material is very sensitive for heat (thermo labile) the steam distillation can't be used then, but other methods like:**
 - **Hydrosteam distillation**: here the plant is separated from the water by a membrane, the plant part is inserted to the membrane and by water heating, the vapor passes this membrane to the plant material, the v.o. is then extracted.

إذا كانت
المادة حساسة
لدرجة الحرارة
بالمكان
مما يضرها الحرارة
مباشرة

3. Acelleular products

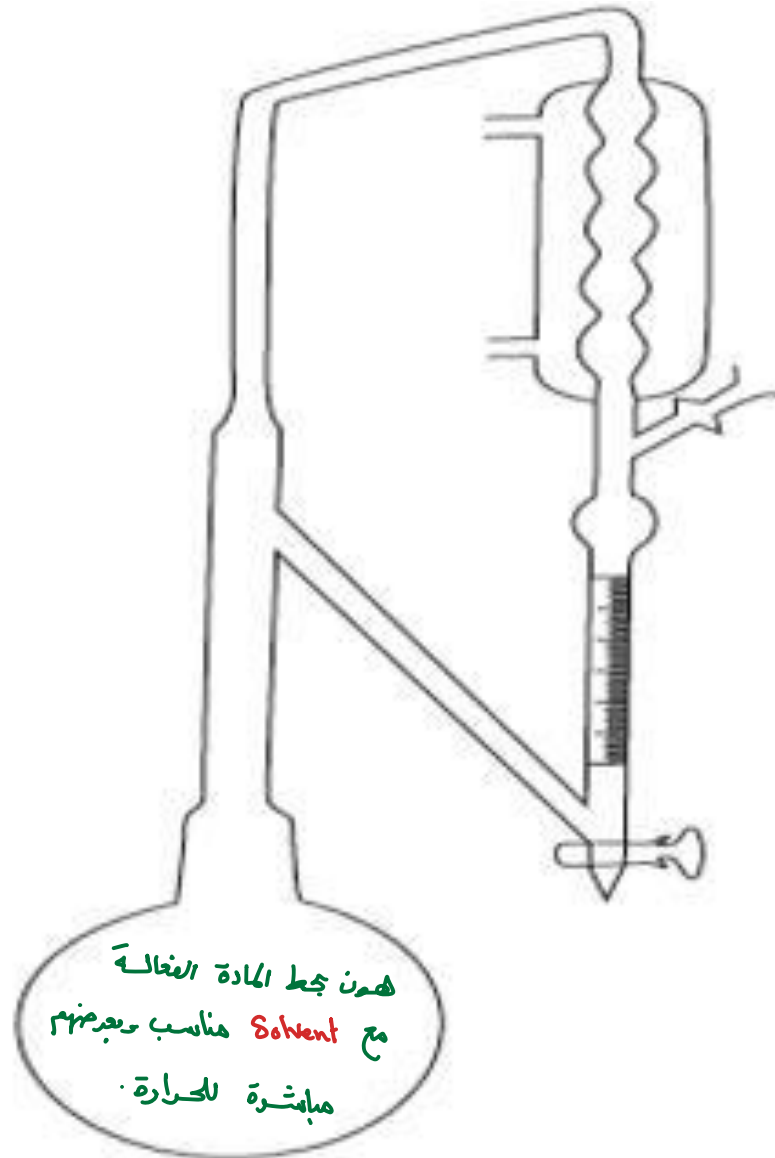
عادةً لزيوت الحمضيات
بأنها ما يخرج بتعرض حرارة
أبداً ↑

- **3. Expression** **العصر** used **pharmaceutically for citrus oils only**, fruits are turned by a stainless steel perforated roll , each pore is attached into an opening ending into a collector, upon turning these pores are induced.
- **4. Solvent extraction , using alcohol** , not used in pharmaceutical industry.
- **5. Enzymatic hydrolysis** : very uncommon , some **V.O. that has a sugar part** force to use this method to extract the non-sugar part (previously mentioned example: Vanilla).
أجلته
الذخيرة
بعد
- **6. Enfleurage** : in expensive perfume industry , an old method that uses sheets of waxes or fatty solid materials , the plant is inserted into these glassy sheets , then put in woody frames for a week or 2 weeks in a dark area , then the plant part used is removed and the sheets then are treated with alcohol to produce a concentrate of these v.o.
مستخلص
بكتلة
حبال العطور



3. Acellular products

VOLATILE OIL STEAM DISTILLATION



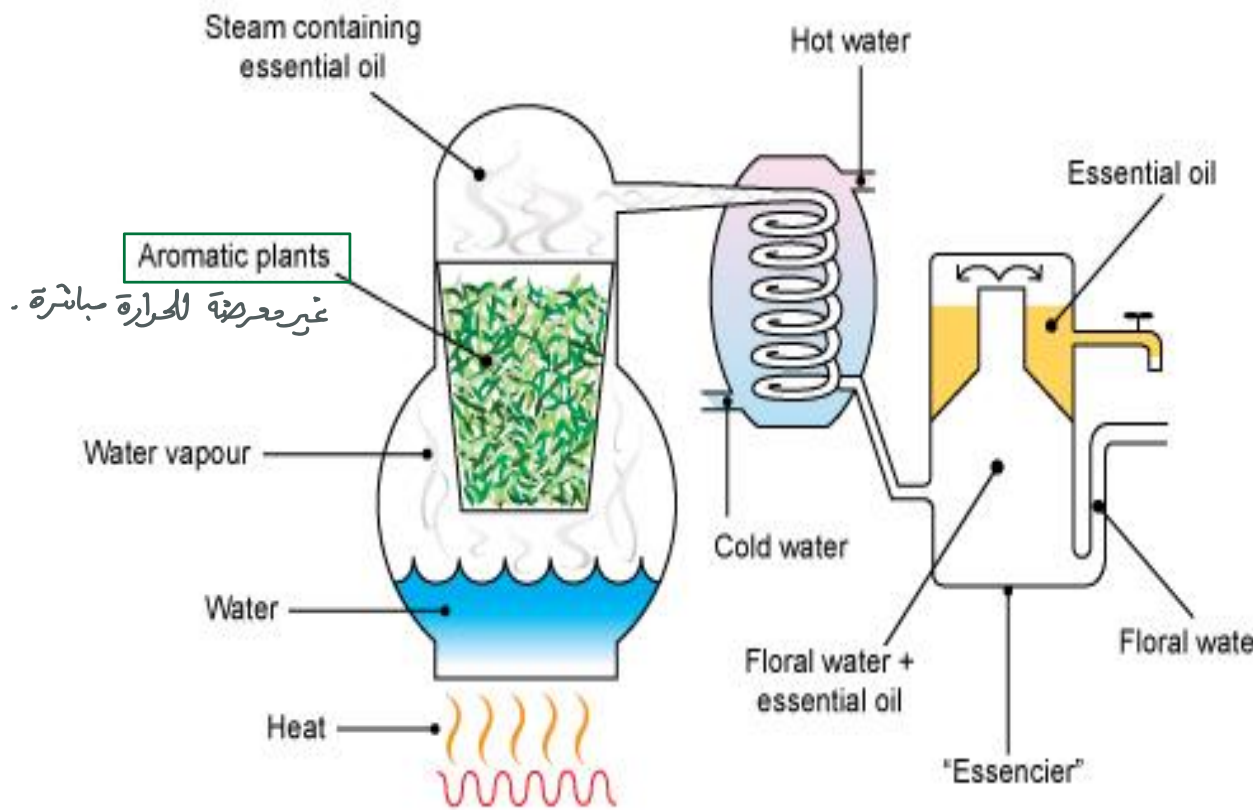
Clevenger tube

Figure 1. Clevenger-type apparatus — *Appareil de type Clevenger*.

3. Acellular products

VOLATILE OIL STEAM DISTILLATION

Hydro-steam distillation



Clavenger tube

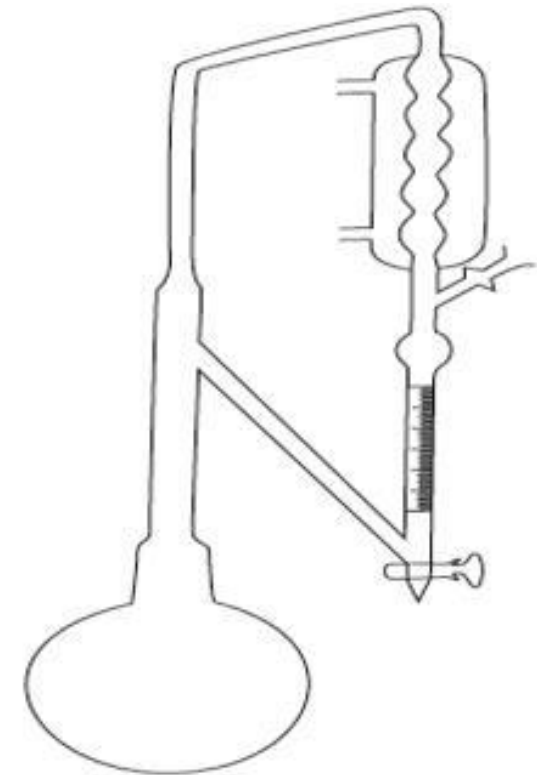


Figure 1. Clavenger-type apparatus — *Appareil de type Clavenger.*