

وزارة التعليم العالي والبحث العلمي

كلية المستقبل الجامعة

قسم الصيدلة

مختبر الصيدلة الفيزيائية / المرحلة الثانية

---

EXP 1

## Viscosity of Liquid

### **The purpose of the experiment:**

To determine the viscosity of benzene and acetone using Ostwald's U tube viscometer.

### **Principle:**

The viscosity of a fluid is the internal resistance to flow. This is also called as coefficient of dynamic viscosity.

When equal volume of two liquid (one test and the other reference standard whose viscosity is known) are flown through the same apparatus under same driving pressure:

$$\frac{\eta_{test}}{\eta_{standard}} = \frac{d_{test} \cdot t_{test}}{d_{standard} \cdot t_{standard}}$$

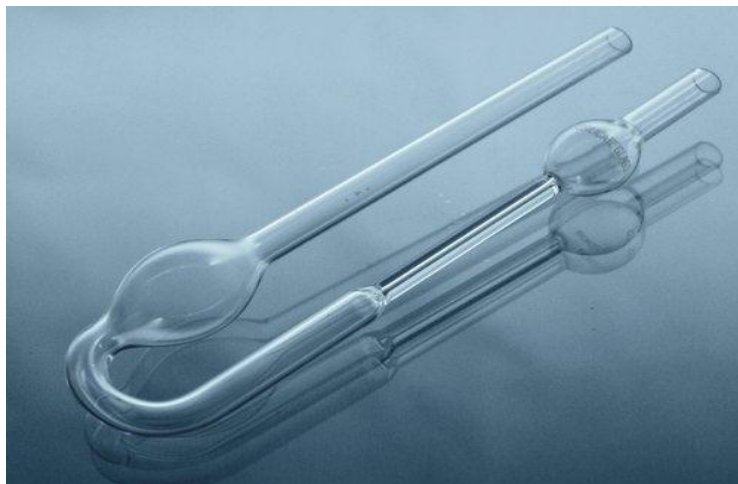
As absolute viscosity determination is difficult, the viscosity of a liquid can be determined easily by comparing with a liquid whose viscosity is known using the above equation, where:

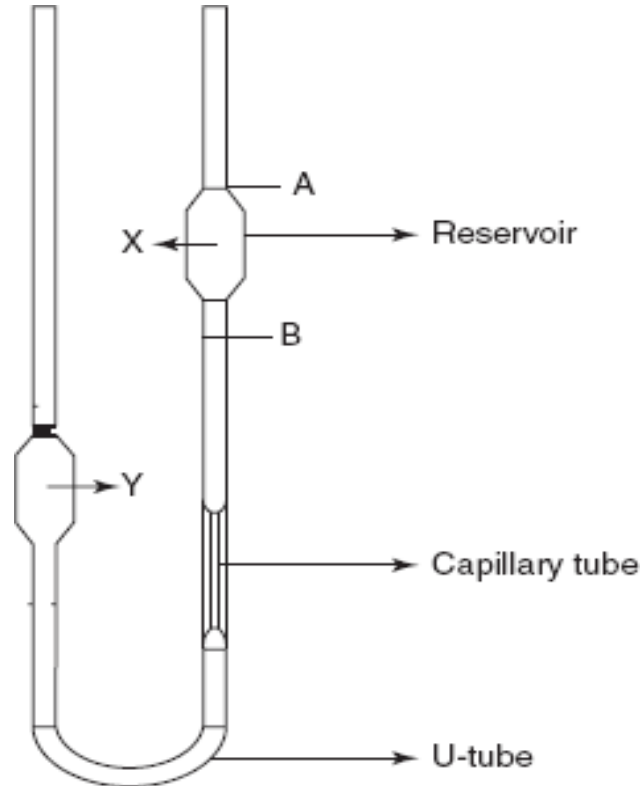
$\eta_{test}$ : Viscosity of test

$\eta_{standard}$ : Viscosity of standard

d: density of test and standard

$t_{test}, t_{standard}$  : Time of test and standard flow





## Ostwald's viscometer

### Procedure

- 1- The cleaned viscometer is vertically clamped
- 2- Sufficient liquid whose viscosity is to be determined is poured using a pipette into bulb Y to reach the mark.
- 3- The liquid is then sucked or blown up to a point 1 cm above A.
- 4- The time for the liquid to fall from A to B is measured using a stopwatch. This is repeated for three times to ensure that accurate time is only recorded.
- 5- In the similar way, the data for the standard liquid (water) is recorded using the same apparatus after cleaning and drying.

What are the importance of viscosity in pharmacy?

- 1- The viscosity of injection should not to be too high that it prevent the passage through the needle when the plunger is pushed.
- 2- Ophthalmic preparations are sometimes adjusted to certain viscosity so that they could not to be easily washed off and thus to prolong the contact period.
- 3- By increasing viscosity, the stability of suspensions and emulsions can be improved.

*Asst. Lec. Sarah Mohammed Ali*

*E-mail : Sarah.mohammed@mustaqbal-collge.edu.iq*