وزارة التعليم العالي والبحث العلمي

كلية المستقبل الجامعة

قسم الصيدلة

مختبر الصيدلة الفيزياوية / المرحلة الثانية

EXP 2

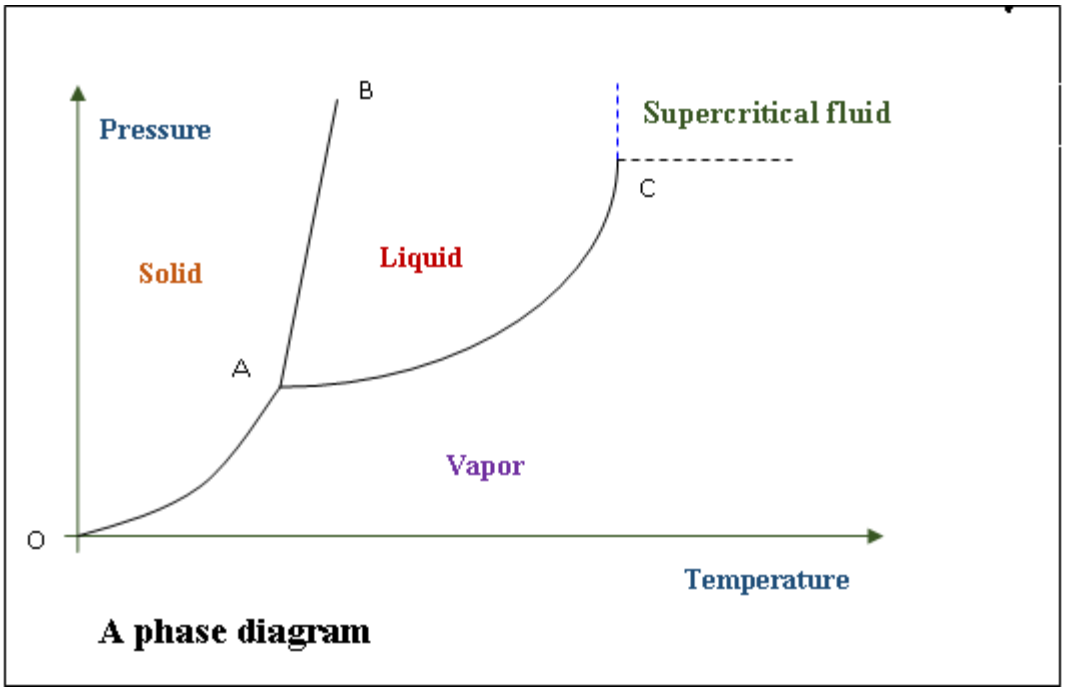
Two component system containing liquid phase

The purpose of the experiment:

To determine the critical solubility temperature (C.S.T) at which both liquids are miscible.

Introduction

The phase is defined as the part of the system that is chemically and physically homogeneous, and is separated from the homogeneous parts by surface boundaries.



(A C) line represents the equilibrium between the gas and liquid phases

(A B) This line represents the equilibrium between the solid and liquid phases

(A O) This line represents the equilibrium between the gas and solid phases

These curves represent the values of pressure and temperature at which each phase can be in equilibrium.

The three curves intersect at the point (A), and this point is called the triple point. At this point the three phases are in equilibrium.

Phase Rule:

It is an equation that gives the relationships between the number of degrees of freedom (F) for a system containing a balanced set of components (C) with the number of phases (P).

$$F = C - P + 2$$

Chemical and tools :

1- Water bath
2- Test tube
3- Phenol
4- Distal water

Procedure:

1- Weigh 1 gm. of phenol and put it into a test tube

2- Add 3 ml of distilled water to the phenol in the tube

3- Heat the mixture on a water bath until the solution is clear .

Record temperature (t 1) the degree of separation of the two layers

4- Transfer the tube to a cold water bath until the solution becomes cloudy (terpidity)

Record temperature (t 2) the degree of mixing of the two layers

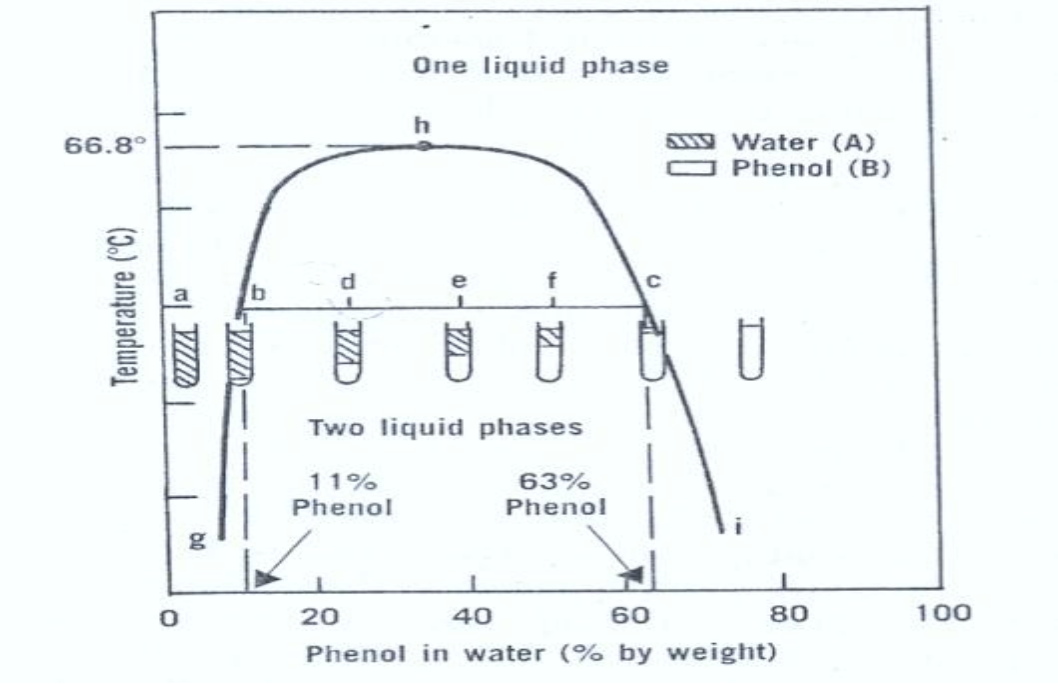
5- Repeat the steps using different volumes of water.

Results and calculations

1- The results are arranged as in the following table

Wt. (phenol)	V/ml H_2O	T1 /C^0 heating	T2 /C^0 cooling	T/ average T1+ T2/2
1	**9**			
3	**7**			
5	**5**			

2- Find the average temperature in the cooling and heating states of the mixture.
3- Find the molar fraction of phenol in each of the above mixtures.
4- The solubility curve is drawn between the temperatures (average) on the vertical axis and the molar fraction of phenol on the horizontal axis.



66.8 C^0

Is the critical solution temperature.

Discussion

To find the minimum temperature at which the mixture , phenol and water become completely miscible at all proportions.

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