

TO STUDY THE RATE OF EVAPORATION OF DIFFERENT LIQUIDS

- INTRODUCTION
- REQUIREMENTS
- PROCEDURE
- OBSERVATIONS
- CONCLUSION

INTRODUCTION

When a liquid is placed in an open vessel, it slowly escapes into gas phase, eventually leaving the vessel empty. This phenomenon is known as evaporation. Evaporation of liquids can be explained in terms of kinetic molecular model. Although there are strong inter-molecular attractive forces which hold molecules of a liquid together, the molecules having sufficient kinetic energy can escape into gas phase if such molecules happen to come near the surface. In a sample of liquid all the molecules do not have same kinetic energy. There is a small fraction of molecules which have enough kinetic energy to overcome the attractive forces and escape into gas phase.

Evaporation causes cooling. This is due to the reason that the molecules, which undergo evaporation, are high-energy molecules; therefore the kinetic energy of molecules which are left behind is less. Since the remaining molecules have lower average kinetic energy therefore, temperature must be lower. If the temperature is kept constant the remaining liquid will have the same distribution of molecular kinetic energies and the high-energy molecule will keep on escaping from the liquid into the gas phase. If the liquid is taken in an open vessel, evaporation will continue until whole of the liquid evaporates.

REQUIREMENTS

Apparatus:

- Three Petri dishes of diameter 10 cm with covers
- 10 ml pipette
- Stop watch

Chemicals:

- Acetone
- Benzene
- Chloroform

PROCEDURE

- Clean and dry the Petri dishes and mark them as A, B, C.
- Pipette out 10 ml of acetone to Petri dish A and cover it.
- Pipette out 10 ml of benzene in Petri dish B and cover it.
- Pipette out 10 ml of chloroform in Petri dish C and cover it.
- Uncover all the three Petri dishes simultaneously and start the stop-watch.
- Note the respective time when the liquids evaporate completely from each Petri dish.

OBSERVATIONS

Petri dish Mark	Liquid Taken	Time taken for complete evaporation
A	Acetone	53 min
B	Benzene	42 min
C	Chloroform	30 min

CONCLUSION

The rate of evaporation of the given three liquids is in the order:

Chloroform > Benzene > Acetone