

CLASS IX

CHEMISTRY

CHAPTER 1 – MATTER IN OUR SURROUNDINGS

CASE STUDY QUESTIONS

1. *In an experimental activity, crushed ice was taken in a beaker. A thermometer is fitted in such a way that its bulb was thoroughly surrounded by ice. The beaker is now slowly heated and temperature was regularly noted. Temperature rises gradually as the heating is continued and becomes constant when ice starts changing into liquid.*

Select the correct answers for the following questions:

i) *What name is associated with conversion of ice into water?*

- a) Evaporation
- b) Sublimation
- c) Freezing
- d) Fusion of Solid

ii) *What specific name is given to the constant temperature?*

- a) latent heat of fusion
- b) Boiling Point
- c) Melting Point
- d) Condensation point

iii) *The heat added to the system at constant temperature is called*

- a) specific heat b) latent heat
- c) residual heat d) none of the above

iv) *Where does the heat energy go when the temperature does not rise?*

- a) It makes the molecular motion of the liquid faster
- b) It raises the temperature of the beaker only.

- c) It is utilised for bringing out the complete change of state
- d) It slows down the molecular motion

2. A hot air balloon has three major parts: the basket, the burner, and the envelope. The basket is where passengers ride. The basket is usually made of wicker. This ensures that it will be comfortable and add little extra weight. The burner is positioned above the passenger's heads. The envelope is the colourful fabric balloon that holds the hot air. The pilot can control the up-and-down movements of the hot air balloon.

Answer the following questions.

1. What keeps a hot air balloon flying?
2. How the balloon's pilot can control the balloon's altitude?
3. Using the passage as a guide, it can be inferred that which of the following statements is not true?
 - (a) Air goes up and out the top of a chimney when you light a fire.
 - (b) Cool air collects about the ceiling when you open a refrigerator.
 - (c) Smoke from a candle rises after you blow out the flame.
 - (d) Cold air coming from an air conditioning vent settles about the floor
4. According to the author, wicker is
 - I. Comfortable
 - II. light weight
 - III. Durable
 - a) I only
 - b) I and II only
 - c) II and III only
 - d) I , II and III

3. Temperature can be expressed in three important scales. These are Celsius scale ($^{\circ}\text{C}$), Fahrenheit scale ($^{\circ}\text{F}$) and Kelvin scale (K). Kelvin scale is often used to express temperature in scientific data. Temperature in any one scale can be easily converted into another scale by using the following equations. If x is the temperature on Celsius scale, then

$$x^{\circ}\text{C} = (x+273) \text{ K} \quad \text{and} \quad x^{\circ}\text{C} = \left[\frac{9}{5}x + 32 \right]^{\circ}\text{F}$$

Answer the following questions using above information

i) What is the boiling point of water in Kelvin scale?

ii) If $x^{\circ}\text{C} = x^{\circ}\text{F}$, what is the value of x ?

iii) Freezing point of water is

- a) 0 K
- b) 0°F
- c) 273 K
- d) 273°F

iv) If temperature of certain oil is 65°C , what is the corresponding temperature on Kelvin scale?

- a) 330 K
- b) 155 K
- c) 298 K
- d) 338 K

4. An ice cube weighing 100 g and having volume V is taken out of the freezer at -10°C and placed in a glass beaker. The beaker is slowly heated till the temperature becomes 25°C .

Answer the following questions on the basis of given information.

i) If we measure the temperature of the content of beaker and plot it in a function of time, how will the graph appear?

ii) At what stage, the temperature will become constant for some time although heating is continued?

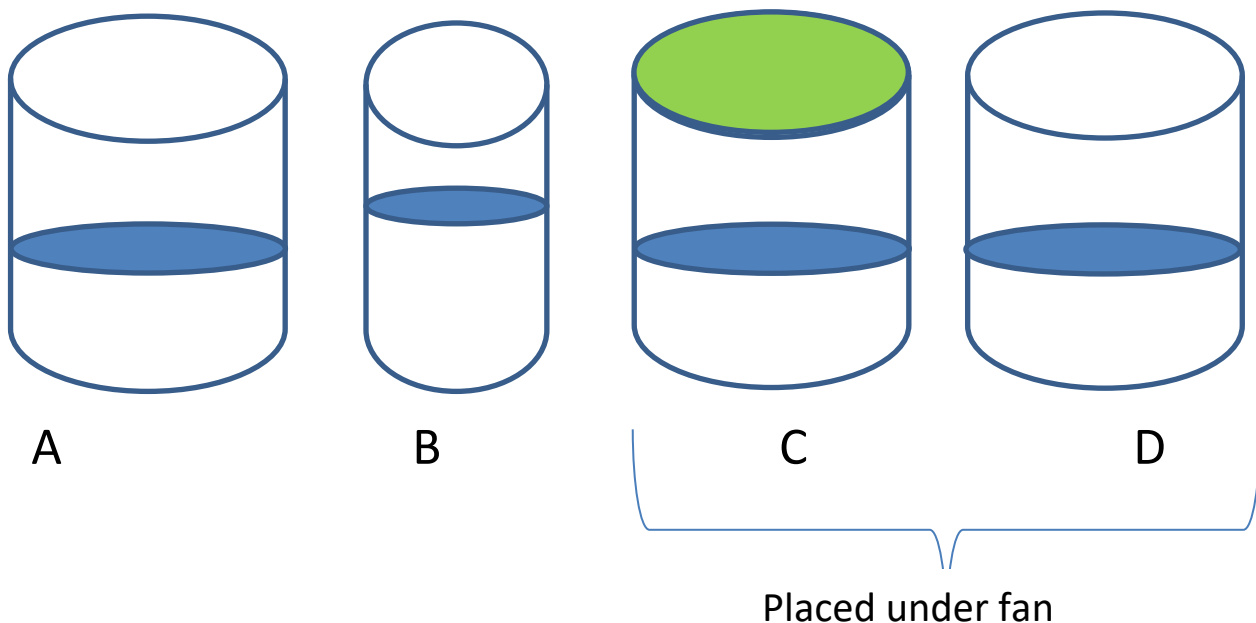
iii) The heat absorbed at the constant temperature during the process is called

- a) Heat capacity
- b) melting point
- c) heat of absorption
- d) latent heat of fusion

iv) Once the ice cubes completely get converted into water, the volume of water will be

- a) equal to V
- b) more than V
- c) equal to $2V$
- d) less than V

5. 100 ml of water was placed in four vessels A, B, C, D. Vessel C, A and D are of same size, B is smaller. Vessel C is covered and C and D are placed under the fan as shown



Read the above information and answer the following questions.

i) In how many beakers, water will escape into atmosphere as vapours ?

ii) What name is given to the process of escaping of water from liquid to vapour state?

iii) After one hour from the beginning of the experiment the water level will fall to the maximum in which beaker?

- a) C
- b) A
- c) D
- d) Both in A and D

iv) What happens in beaker C?

6. In certain investigatory project 150 ml of water is taken in each of the four beakers A, B, C and D. Beaker A and B are maintained at temperature 25°C while C and D are maintained at temperature 65°C. Four crystals of copper sulphate of approximately same mass (say 2g) are taken and two of them are ground into powder form. Now, crystals are added in beaker A and C while powdered form of the salt are added in beaker B and D respectively.

Mark the correct answer in each of the following questions:

(i) In which beaker the intermixing will be the quickest?

- a) C b) D c) A d) B

(ii) Rate of intermixing will be:

- a) Same in A and C
b) Same in A and B
c) Quicker in B than in A
d) Slower in C as compared to that in A

(iii) Colour of solution after intermixing is:

- a) Greenish b) Bluish c) Pinkish d) Violet

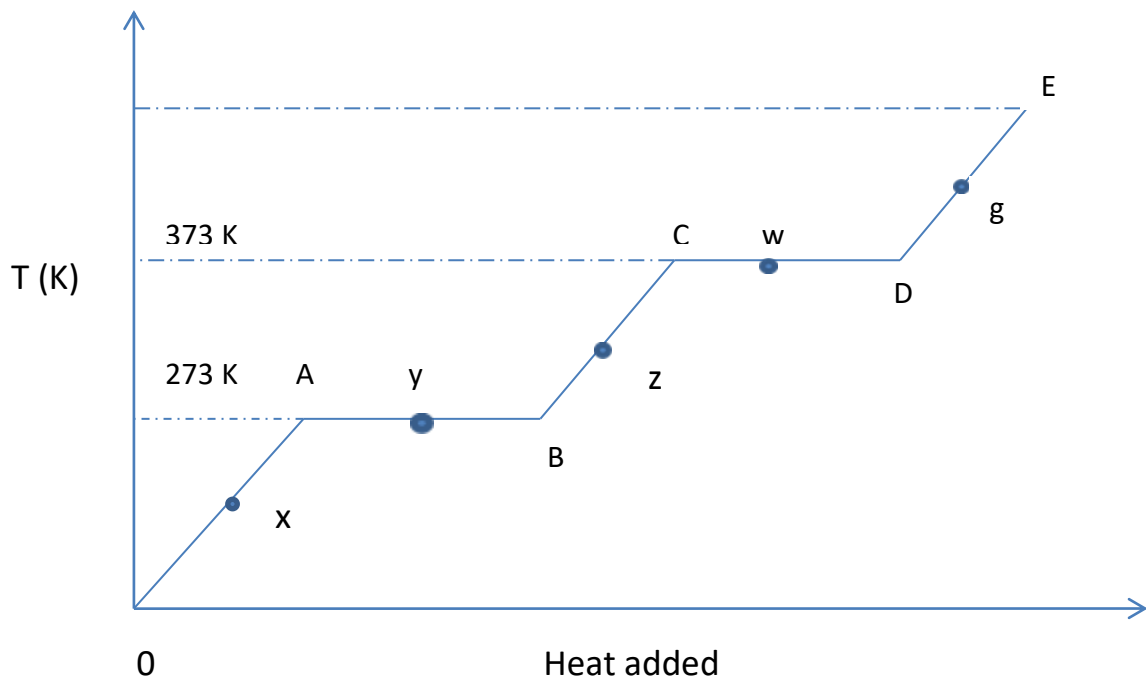
(iv) Phenomenon responsible for intermixing is called

- a) Diffusion of solid into liquid
b) Diffusion of liquid into solid
c) Sedimentation
d) Freezing

(v) Which of the following evidence is not provided by the experimental activity?

- a) Particles of matter are in a state of motion.
b) Particle motion increases with rise in temperature
c) Particles of matter are stationary
d) There are empty spaces between the molecules.

7. A teacher asked a group of students to heat a given sample of ice and to draw a heating curve representing temperature rise as a function of heat added. After performing experiment at one atmospheric pressure, the students gave the following curve



Mark the correct answer in each of the following questions:

(i) What is the physical state of substance at point y?

(a) Ice only

(b) Water only

(c) Ice and water coexist

(d) Ice and vapour

(ii) Heat added per gram of the substance along the line CD is known as

(a) Specific heat

(b) reserve heat

(c) Solar heat

(d) Latent heat of vaporisation

(iii) Physical state of substance at point w is:

(a) Water vapour

(b) ice

(c) Water and vapour coexist

(d) only water

(iv) Which lines represent the change of state without undergoing any change of temperature?

(a) AB and CD

(b) OA and AB

(c) OA and BC

(d) CD and DE