

Chapter 6: Heat Transfer

Worksheet 1

1. Write T for true and F for false statement.

- (i) Evaporation occurs at all temperatures.
- (ii) The boiling process is a rapid process.
- (iii) Ether expands more than alcohol on heating.
- (iv) Liquids expand less than solids on heating.
- (v) When the length of solid rod increases on heating, the thermal expansion is called area expansion.

2. Fill in the blanks.

- (i) _____ process takes place at a fixed temperature.
- (ii) Gases expand _____ than solids and liquids on heating.
- (iii) The SI unit of coefficient of superficial expansion is _____.
- (iv) Water on heating expands _____ than alcohol.
- (v) The value of coefficient of linear expansion of a solid depends on its _____.

3. Solve the following numerical problems.

- (i) Find the increase in length of an aluminium cable of length 40 m when the temperature rises from 15°C to 45°C. The coefficient of linear expansion of aluminium is $2.4 \times 10^{-5}/^{\circ}\text{C}$.
- (ii) If the coefficient of linear expansion of steel is $2.2 \times 10^{-5}/^{\circ}\text{C}$, then find the value of its coefficient of superficial expansion and coefficient of volume expansion.

4. Answer these questions.

- (i) Name the fixed temperature at which a liquid boils to form a gas.
- (ii) Define coefficient of linear expansion of a solid.
- (iii) Establish the relationship between coefficient of volume expansion and coefficient of linear expansion.
- (iv) Name the three factors on which the thermal expansion of a liquid depends.
- (v) Why are connections of telephones and electric wires in summer kept loose?

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Worksheet 2

1. Tick the correct answer.

- (i) Which form of energy gives sensation of warmth and coldth?
(a) heat (b) electric (c) light (d) none
- (ii) Heat energy always flows from
(a) higher to lower temperature (b) remains constant
(c) lower to higher temperature (d) none
- (iii) The amount of area expansion depends on the
(a) original area (b) rise in temperature
(c) nature of the solid material (d) all of these
- (iv) When solid gets heated, the vibrational kinetic energy of molecules
(a) increases (b) decreases (c) remains constant (d) none
- (v) How many kinds of thermal expansion in solids does have?
(a) two (b) three (c) four (d) five

2. Define the following.

- (i) Temperature
(ii) Thermal expansion
(iii) Coefficient of volume expansion
(iv) Area expansion
(v) Evaporation

3. Match the columns.

Column A

- (i) Solids
(ii) Liquids
(iii) Gases
(iv) Evaporation
(v) Boiling

Column B

- (a) Molecules are very loosely packed
(b) Molecules are tightly packed
(c) Leads to cooling of the surroundings
(d) Temperature remains unchanged
(e) Molecules are loosely packed

4. Answer these questions.

- (i) What happens to an object when it cools?
- (ii) Is evaporation a surface phenomenon only?
- (iii) Name the kinds of thermal expansion in solids.
- (iv) Why are the car tyres filled with less air during summer?
- (v) Why does the thick-walled glass tumbler crack when hot milk is poured into it?