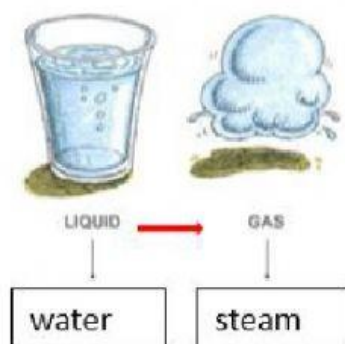


Name :

Formative Practice 4.3. Fill in the blank.

Note:- Do not use any value in standard form such as 3.0×10^3 . If you need such as the value, convert it become 3000.

1. Calculate the energy absorbed by 30 g of 100°C water that is turned into 100°C steam. [Specific latent heat of vaporisation of water = $2.26 \times 10^6 \text{ J kg}^{-1}$]



Step 1

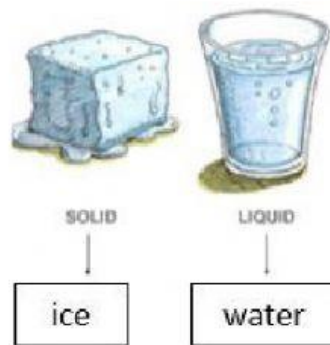
Identify and write down the formula used. $Q = ml$

Step 2, change g into kg. $m = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ kg}$

Step 3, Substitute numerical values into the formula, $Q = ml = \underline{\hspace{2cm}} \text{ kg} \times \underline{\hspace{2cm}} \text{ kg}^{-1}$

Step 3, Perform the calculations. $Q = \underline{\hspace{2cm}} \text{ J}$

2. Calculate the quantity of heat required to change 1.0 kg of ice at 0 °C to water at 15 °C. [Given, Specific latent heat of fusion of ice = $3.34 \times 10^5 \text{ J kg}^{-1}$; Specific heat capacity of water = $4200 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$]



Step 1

Identify and write down the formula used.

$$Q = ml + mC\Delta\theta$$

Step 2

Substitute numerical values into the formula

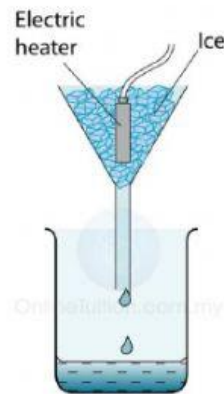
$$Q = (\boxed{} \text{ kg} \times \boxed{} \text{ Jkg}^{-1}) + (\boxed{} \text{ kg} \times \boxed{} \text{ Jkg}^{-1}\text{ }^\circ\text{C}^{-1} \times \boxed{} \text{ }^\circ\text{C})$$

Step 3

Perform the calculations

$$Q = \boxed{} \text{ J}$$

3. Calculate the amount of ice that would be melted by a 50 W heater in five minutes at 0 °C. Assume that no heat loss to the surrounding. [Specific latent heat of fusion of ice = $3.34 \times 10^5 \text{ J kg}^{-1}$]



Step 1

Identify and write down the formula used.

$$Q_{\text{released}} = Q_{\text{absorbed}}$$
$$Pt = ml$$

Step 2

Substitute numerical values into the formula

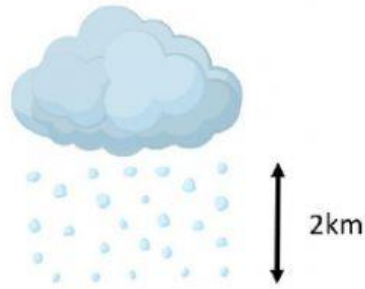
$$\boxed{} \text{ W} \times \boxed{} \text{ min} \times 60 \text{ s} = m \times \boxed{} \text{ J kg}^{-1}$$

Step 3

Perform the calculations

$$m = \boxed{} \text{ kg}$$

4. A hailstone of mass 3.50 g fall from 2 km height. [given, $g = 10 \text{ N}$, Specific latent heat of fusion of ice = $3.34 \times 10^5 \text{ J kg}^{-1}$]



What is its potential energy?

Step 1

Identify and write down the formula used.

$$E_p = mgh$$

Step 2

Substitute numerical values into the formula

$$E_p = \boxed{} \text{ kg} \times \boxed{} \text{ N} \times \boxed{} \text{ m}$$

Step 3

Perform the calculations

$$E_p = \boxed{} \text{ J}$$

Assume that all the potential energy is converted to heat energy and melts the hailstone, calculate the mass of the hailstone on reaching the ground.

Step 1

Identify and write down the formula used.

$$Q = E_p$$

Step 2

Substitute numerical values into the formula

Mass of melting ice = m. Thus, find m.

$$m = \frac{\boxed{} \text{ J}}{\boxed{} \text{ J kg}^{-1}} = \boxed{} \text{ kg}$$

Step 3

Perform the calculations

Mass of ice when reaching the ground = Mass of ice – Mass of melting ice

$$m = \boxed{} \text{ g} - \boxed{} \text{ g}$$

$$m = \boxed{} \text{ g}$$