**3** **(a)** State what is meant by *specific latent heat*.

.....

.....

..... [2]

**(b)** A student uses the apparatus illustrated in Fig. 3.1 to determine a value for the specific latent heat of fusion of ice.

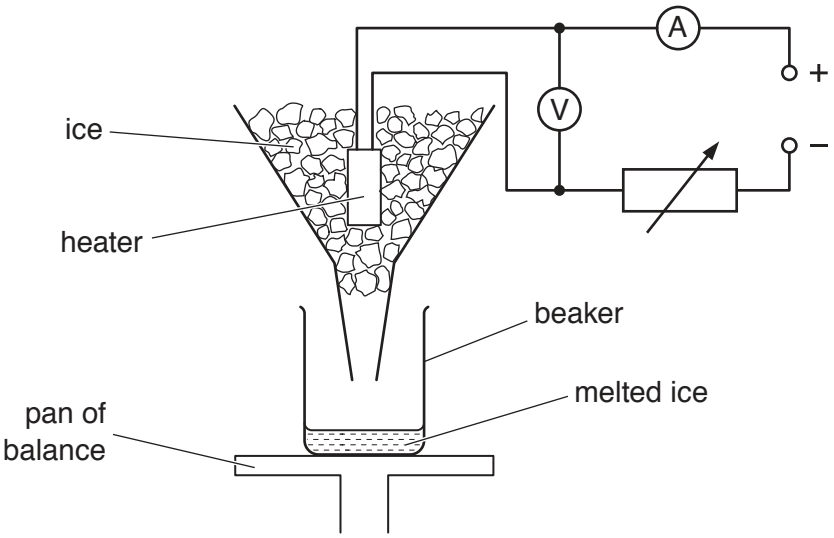


**Fig. 3.1**

The balance reading measures the mass of the beaker and the melted ice (water) in the beaker.

The heater is switched on and pieces of ice at 0 °C are added continuously to the funnel so that the heater is always surrounded by ice.

When water drips out of the funnel at a constant rate, the balance reading is noted at 2.0 minute intervals. After 10 minutes, the current in the heater is increased and the balance readings are taken for a further 12 minutes.

The variation with time of the balance reading is shown in Fig. 3.2.

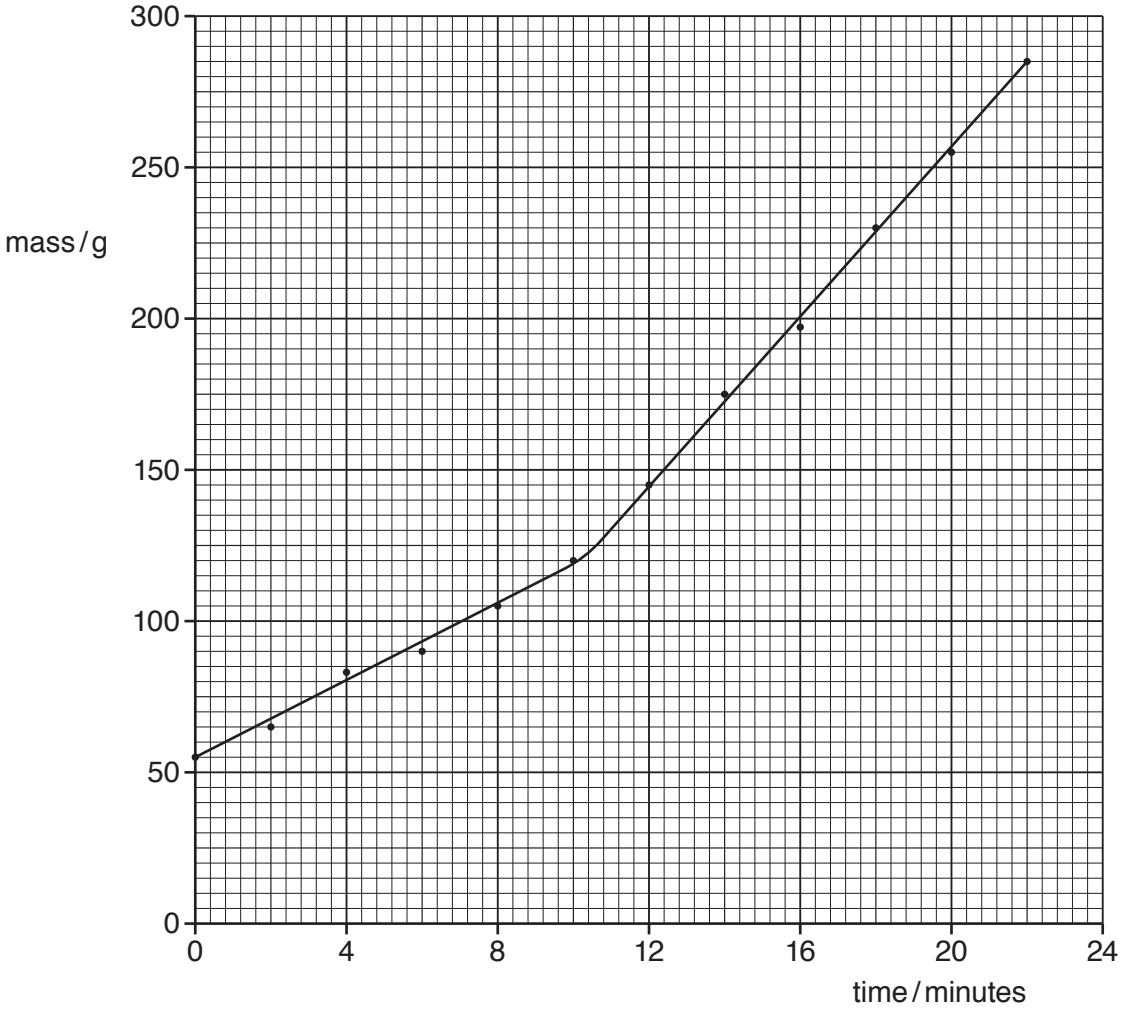


**Fig. 3.2**

The readings of the ammeter and of the voltmeter are shown in Fig. 3.3.

| | ammeter reading /A | voltmeter reading /V |
|---|---|---|
| from time 0 to time 10 minutes<br>after time 10 minutes | 1.8<br>3.6 | 7.3<br>15.1 |

**Fig. 3.3**

**(i)** From time 0 to time 10.0 minutes, 65 g of ice is melted.

Use Fig. 3.2 to determine the mass of ice melted from time 12.0 minutes to time 22.0 minutes.

mass = ..... g [1]

**(ii)** Explain why, although the power of the heater is changed, the rate at which thermal energy is transferred from the surroundings to the ice is constant.

.....

..... [1]

**(iii)** Determine a value for the specific latent heat of fusion $L$ of ice.

$L$ = ..... $J\,g^{-1}$ [4]

**(iv)** Calculate the rate at which thermal energy is transferred from the surroundings to the ice.

rate = ..... W [2]

[Total: 10]