The Properties and Temperature – 2022 November IGCSE 0625

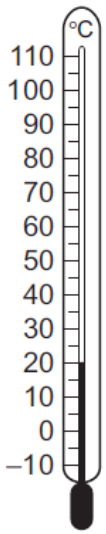
1. Nov/2022/Paper_11/No. 14

What is the temperature difference between the fixed points on the °C temperature scale?

A 10 °C **B** 100 °C **C** 110 °C **D** 120 °C

2. Nov/2022/Paper_12,13/No. 14

The diagram shows a thermometer calibrated in degrees Celsius.



What are the values of the lower fixed point and of the upper fixed point on the Celsius scale?

	lower fixed point / °C	upper fixed point / °C
A	–10	110
B	0	20
C	0	100
D	20	100

3. Nov/2022/Paper_12/No. 15

What happens to a solid when its temperature increases?

A It contracts.

B Its density increases.

C Its internal energy increases.

D Its molecules move freely.

4. Nov/2022/Paper_13/No. 15

Which statements does the term 'melting point' refer to?

1 the temperature at which a liquid changes to solid without a change in temperature

2 the temperature at which a solid changes to liquid without a change in temperature

3 the temperature at which a liquid changes to vapour without a change in temperature

4 the temperature at which a vapour changes to liquid without a change in temperature

A 1 and 2 **B** 2 only **C** 3 and 4 **D** 4 only

5. Nov/2022/Paper_21/No. 14

The diagram shows a liquid-in-glass thermometer.

Which change increases the sensitivity of the thermometer?

A a narrower capillary tube

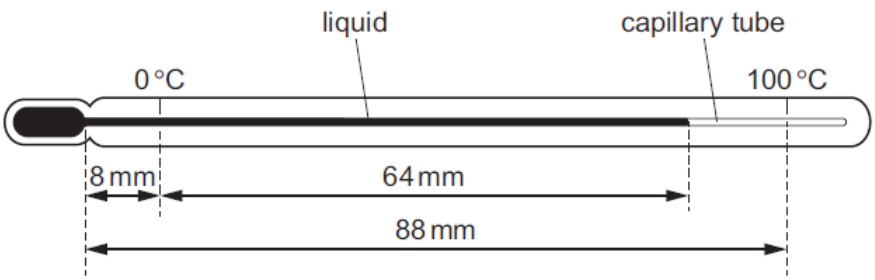
B a wider capillary tube

C thicker glass around the bulb

D thinner glass around the bulb

6. Nov/2022/Paper_21/No. 15

The diagram shows a liquid-in-glass thermometer with a uniform capillary tube.



NOT TO SCALE

Which temperature is indicated by the thermometer?

A 73 °C **B** 80 °C **C** 82 °C **D** 90 °C

7. Nov/2022/Paper_22,23/No.14

Which change in the design of a liquid-in-glass thermometer makes it more sensitive?

A a larger liquid reservoir

B a longer tube

C a smaller liquid reservoir

D a wider tube

8. Nov/2022/Paper_22/No.15

A scientist is determining the specific latent heat of vaporisation of a liquid.

He puts the liquid in a vacuum flask and heats it with a 100 W heater. The mass of liquid in the vacuum flask when it starts to boil is 300 g. He continues to heat the liquid for a further 12 minutes after which the mass of the remaining liquid is 100 g.

What is the specific latent heat of vaporisation of the liquid?

(Assume that all the thermal energy from the heater is used to vaporise the liquid.)

A 6000 J / kg

B 240 000 J / kg

C 360 000 J / g

D 360 000 J / kg

9. Nov/2022/Paper_23No.15

An ice cube of mass 12 g at 0 °C absorbs thermal energy from the surroundings at a rate of 3 J / s. The specific latent heat of fusion of ice is 330 J / g.

How long will it take for the ice cube to melt?

A 82.5 s **B** 1320 s **C** 3960 s **D** 11 880 s

10. Nov/2022/Paper_31No.3

(a) A liquid-in-glass thermometer has a scale with marks from –10 °C to 110 °C.
A student checks the accuracy of the thermometer.

Describe how to check the accuracy of:

(i) the 100 °C mark on the thermometer scale

.....

..... [1]

(ii) the 0 °C mark on the thermometer scale.

.....

..... [1]

(iii) State the importance of the 0 °C and 100 °C marks on a thermometer scale.

..... [1]

(b) We can measure temperature by using physical properties that vary with temperature.

(i) State the physical property that we use to measure temperature in a liquid-in-glass thermometer.

..... [1]

(ii) State another physical property that we use to measure temperature.

..... [1]

[Total: 5]

11. Nov/2022/Paper_33/No.4(a_ b)

(a) During an experiment, a heater supplies thermal energy to a substance. Initially, the substance is a solid. The substance is heated until it becomes a gas.
The temperature of the substance varies with time as shown in Fig. 4.1.

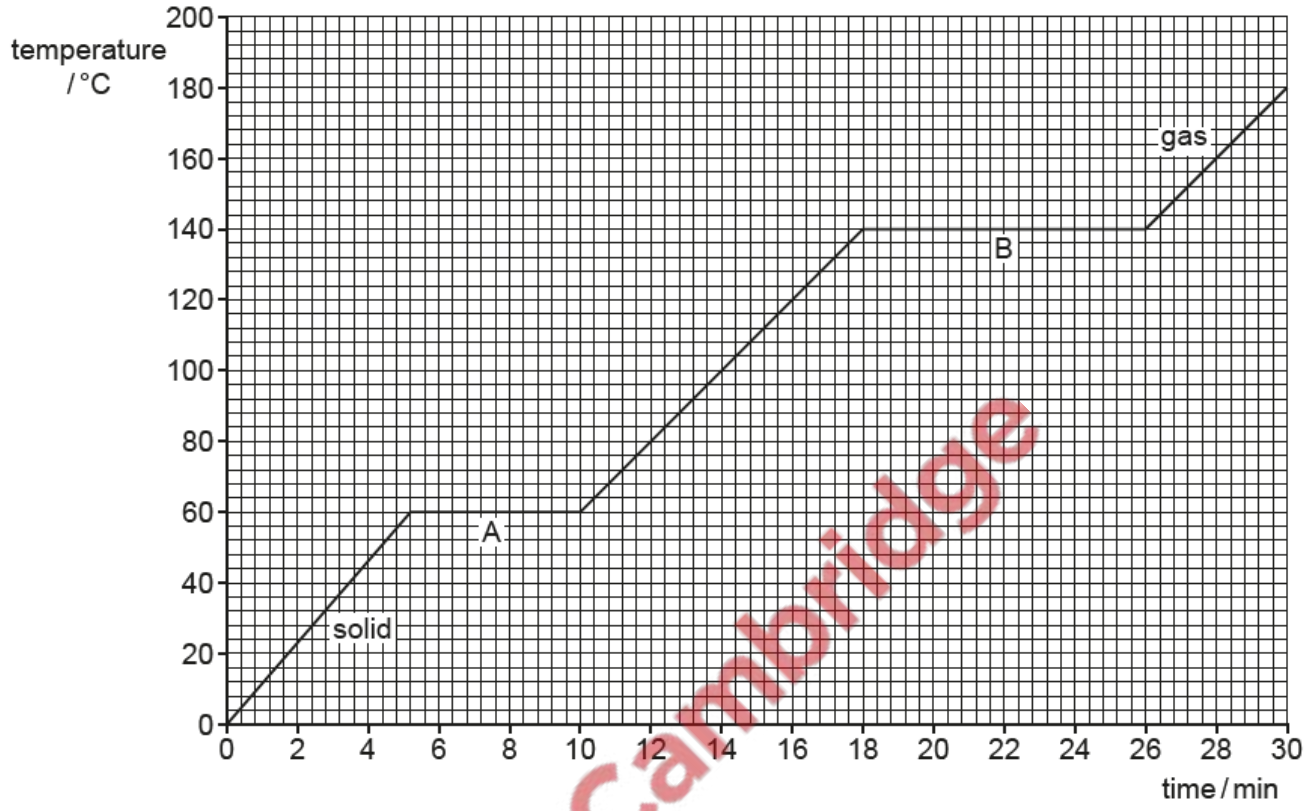


Fig. 4.1

(i) Give the state of the substance between A and B on Fig. 4.1.

..... [1]

(ii) State the process that is occurring at:

A .....

B .....

[2]

(b) The experiment is repeated using a heater with a greater power output. All other variables are kept constant.

Suggest how the temperature of the substance varies with time. Draw on Fig. 4.1. [3]

12. Nov/2022/Paper_41/No.4(b)

(b) The initial temperature of the cylinder and the gas is 21 °C and, in the freezer, the temperature of the cylinder decreases to –18 °C.

The thermal capacity of the cylinder is 89 J / °C.

Calculate the change in the internal energy of the cylinder.

change in internal energy = ... [2]

13. Nov/2022/Paper_42/No.5(a)

Fig. 5.1 shows an aluminium block after leaving a furnace in a factory.

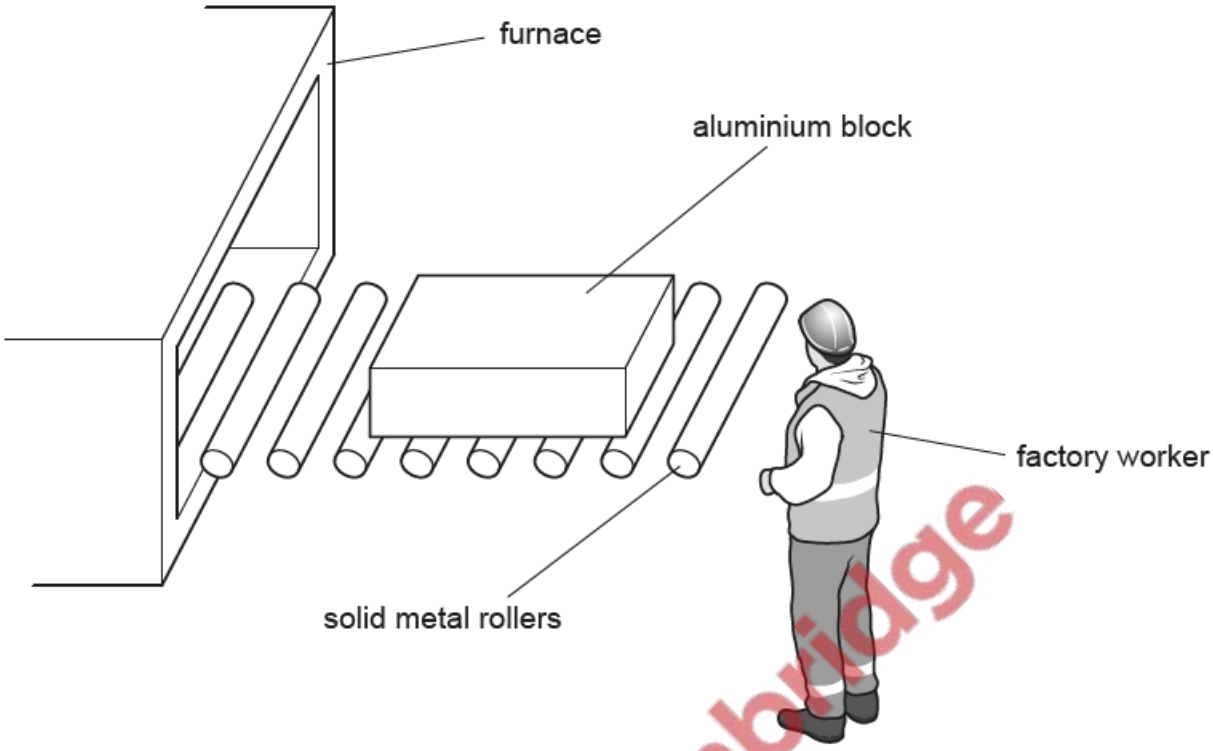


Fig. 5.1

(a) The mass of the block is 1200 kg and it is heated in the furnace from 20 °C to 380 °C. The aluminium block does not melt.
The specific heat capacity of aluminium is 960 J / (kg °C).

Calculate the thermal energy gained by the block in the furnace.

thermal energy = ... [3]

14. Nov/2022/Paper_43/No.4

(a) Fig. 4.1 shows a liquid-in-glass thermometer labelled thermometer X.

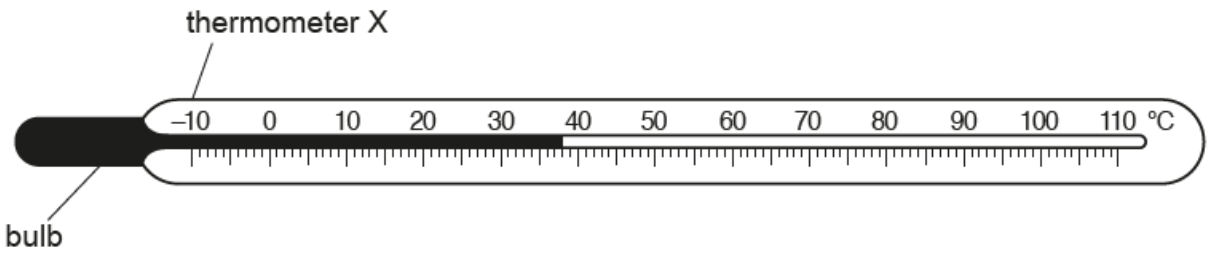


Fig. 4.1

(i) State the physical property which varies with temperature in a liquid-in-glass thermometer.

..... [1]

(ii) Thermometer Y has a bulb that contains twice the volume of liquid compared to thermometer X.

State and explain how the sensitivity of thermometer Y compares with the sensitivity of thermometer X.

statement .....

explanation .....

.....

[2]

(iii) State and explain **one** change that can be made to the design of thermometer X to increase its range.

statement .....

explanation .....

[2]

(b) A liquid-in-glass thermometer cannot measure a temperature of 1300 °C.

State a physical property which varies with temperature in a thermometer which can measure a temperature of 1300 °C.

..... [1]

[Total: 6]

15. Nov/2022/Paper_43/No.5

(a) Three identical dishes, A, B and C, contain an equal volume of water.

Dish A is outside in sunlight and experiences no wind during the day. Dish B is outside in sunlight and experiences a strong wind during the day. Dish C is in a dark room.

Water evaporates from each dish. After 12 hours, a student measures the volume of water in each dish. Dish C contains the largest volume of water and dish B contains the smallest volume of water.

Explain, in terms of particles, why the three dishes have different volumes of water.

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.....

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.....

.....

..... [4]

(b) Define specific latent heat of vaporisation.

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..... [2]

(c) Fig. 5.1 shows an insulating beaker, crushed ice, an immersion heater and a thermometer.

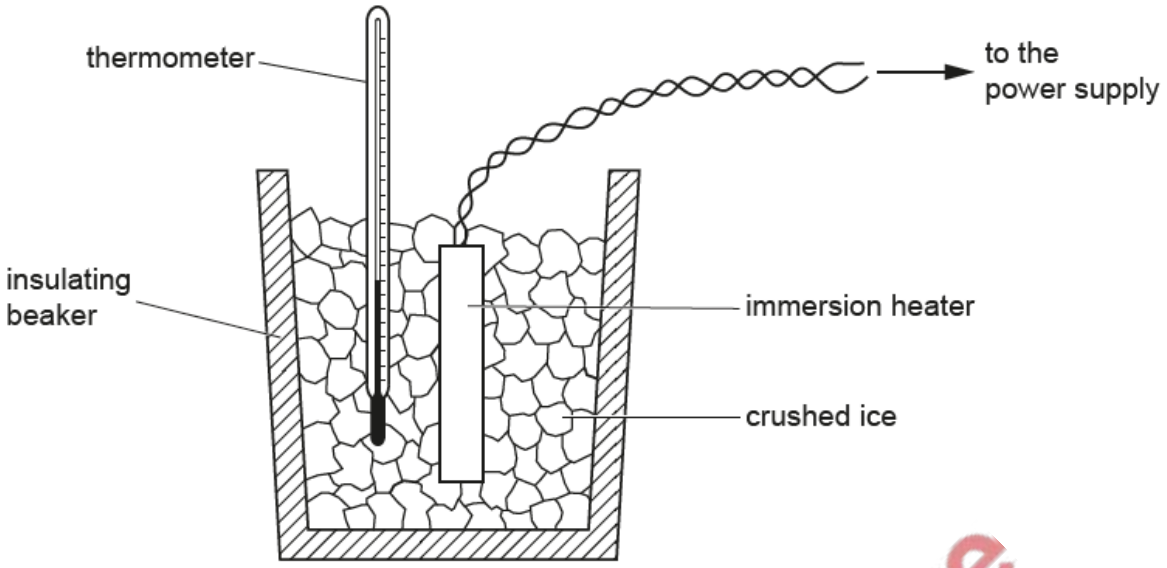

Fig. 5.1

The initial temperature of the ice is –60 °C.
The immersion heater is switched on and the temperature is recorded at equal intervals of time.
Fig. 5.2 shows the temperature–time graph.

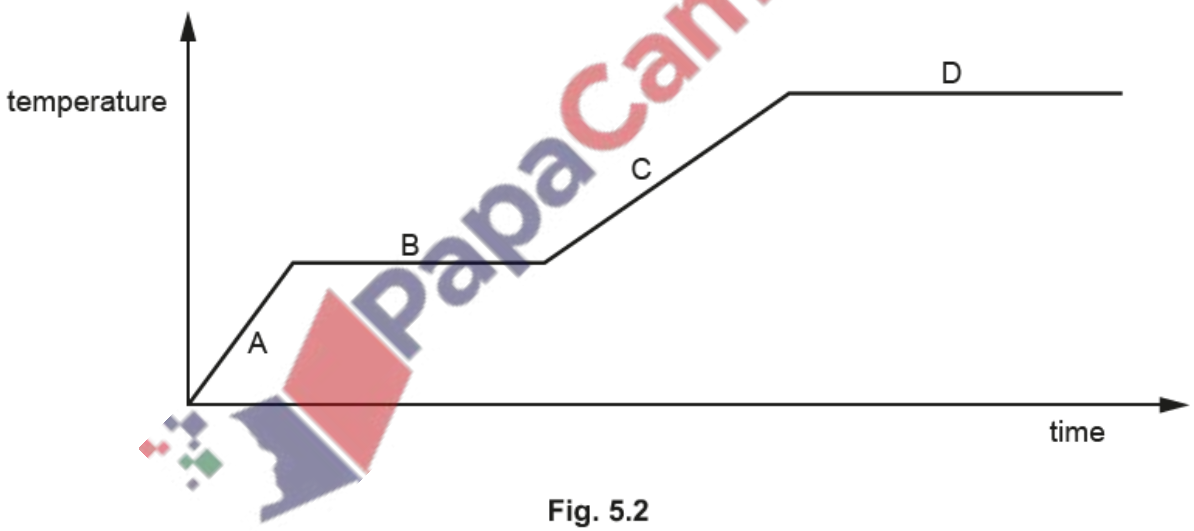

Fig. 5.2

Describe what occurs in each of the sections A, B, C and D.

A .....

B .....

C .....

D .....

[3]

[Total: 9]