

Q1. (2018)

0 4 . 7

Old copper wires are melted when they are recycled.

Calculate the energy needed to melt 500 kg of copper at its melting point.

Specific latent heat of fusion of copper = 200 kJ/kg

Use the Physics Equations Sheet.

[3 marks]

Q3. (2019)

0 7

A scientist cooled the air inside a container.

The temperature of the air changed from 20 °C to 0 °C

The volume of the container of air stayed the same.

0 7 . 2

The air contained water that froze at 0 °C

The change in internal energy of the water as it froze was 0.70 kJ

The specific latent heat of fusion of water is 330 kJ/kg

Calculate the mass of ice produced.

Use the Physics Equations Sheet.

[3 marks]

Q4. (2022)

0 4

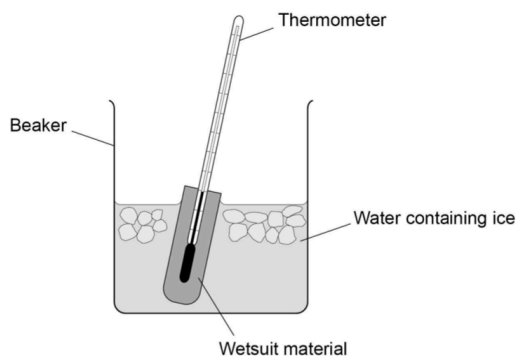
Figure 6 shows a swimmer wearing a wetsuit.

The wetsuit helps to keep the swimmer warm.

Figure 6

A student wrapped a thermometer in a piece of wetsuit material and placed the thermometer in water containing ice.

Figure 7 shows the apparatus.

Figure 7

The student recorded the temperature of the thermometer after 30 seconds for four materials. Each piece of material was the same size and thickness.

In each test the starting temperature of the thermometer was 21.0 °C

Table 2 shows the results.

Table 2

Material	W	X	Y	Z
Temperature in °C	13.5	8.0	16.0	12.0

0 4 . 5 During the investigation 0.0150 kg of the ice melted. The temperature of the water and ice did not change.

specific latent heat of fusion of ice = 334 000 J/kg

Calculate the energy needed to melt the ice.

Use the equation:

energy to melt the ice = mass × specific latent heat

[2 marks]

Q5. (2023)

0 3 A piece of steel is heated until it has all melted.

Steel is a mixture of iron and a small amount of carbon.

Table 1 shows the mass of carbon in 1.0 kg of different types of steel.

Table 1

Type of steel	Mass of carbon in 1.0 kg of steel
Low carbon	2.0 g
Medium carbon	4.5 g
High carbon	7.0 g

A 4.0 kg piece of steel contains 18 grams of carbon.

0 3 . 9 The 4.0 kg piece of solid steel was heated until it reached its melting point.

The additional energy required to melt the piece of steel was 280 000 J.

Calculate the specific latent heat of fusion of the steel.

Use the Physics Equations Sheet.

[3 marks]