



Oxford Cambridge and RSA

## **GCSE Chemistry B (Twenty First Century Science)**

**J258/03** Breadth in chemistry (Higher Tier)

### **Question Set 13**

1 Diamond and graphite are two forms of carbon.

(a) (i) Fig. 1.1 shows the structure of diamond:

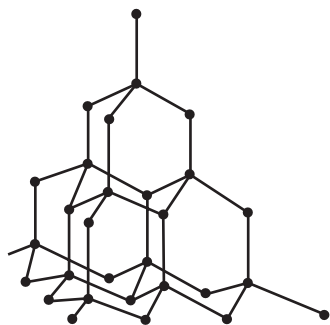


Fig 1.1

Explain why diamond has a high melting point.

[1]

(ii) Fig. 1.2 shows the structure of graphite.

Graphite also has a high melting point.

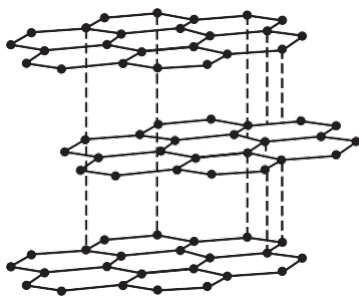


Fig. 1.2

Describe and explain **two** other properties of graphite.

Use the structure shown in Fig. 1.2 to help explain your answers.

[2]

**(b)** Diamond has a high density.

1.0 g of diamond has a volume of 0.29 cm<sup>3</sup>.

Calculate the mass of 1.0 cm<sup>3</sup> of diamond.

Give your answer to **2** significant figures.

Mass = ..... g **[2]**

**(c) (i)** 12 g of diamond produces 44 g of CO<sub>2</sub> when it is burned completely.

Calculate the mass of CO<sub>2</sub> produced when 1.0 × 10<sup>-3</sup> g of diamond is burned completely.

Give your answer to **2** significant figures.

Mass of CO<sub>2</sub> = ..... g **[2]**

**(ii)** Jane makes some statements about graphite and diamond:

1 'Complete combustion of 12 g of graphite produces less than 44 g of CO<sub>2</sub>.'

2 'This is because atoms in graphite are further apart than in diamond.'

Do you agree with Jane's statements?

Explain your answer.

**[2]**

**Total Marks for Question Set 13: 9**

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