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:

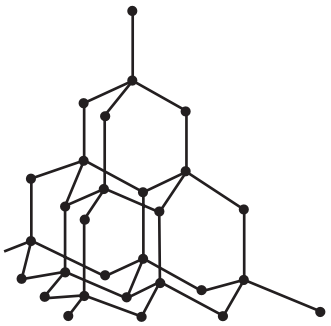

Fig 1.1

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.

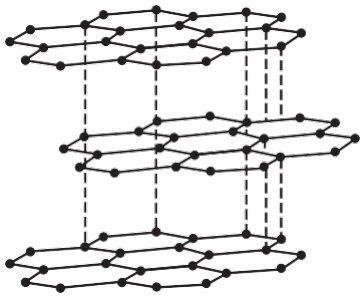

Fig. 1.2

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^3.

Calculate the mass of 1.0 cm^3 of diamond.

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

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

(c) **(i)** 12 g of diamond produces 44 g of CO_2 when it is burned completely.

Calculate the mass of CO_2 produced when 1.0×10^{-3} g of diamond is burned completely.

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

Mass of CO_2 = ... 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_2.'

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