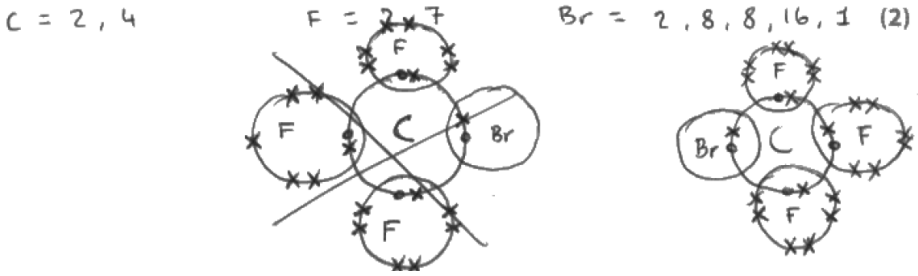
ACTIVITY 7b – AO2 in Exams – Student Answers

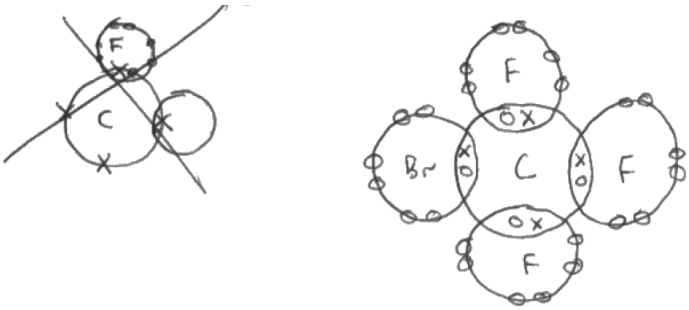
Paper 1C, Q9(b)

Student 1

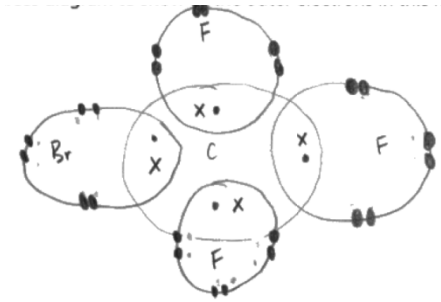
Student 2



Student 3



Student 4



Paper 2C, Q4c(ii)

Student 1

(ii) Explain why magnalium is harder than aluminium.

(3)

In Magnalium the structure is less uniform as magnesium atoms disrupt the the uniformity of the aluminium atoms. This means the atoms can slide over each other less easily, this means the metal is harder and less soft/malleable.

Student 2

(ii) Explain why magnalium is harder than aluminium.

(3)

Magnalium contains the different sized atoms of Mg and Al, therefore this distorts the layers. This means the layers are unable to slide over each other meaning that ~~they~~ Magnalium is hard and not malleable. Aluminium has the same sized atoms so layers can slide over each other, ~~not~~ making it softer, and malleable.

(Total for Question 4 = 7 marks)

Student 3

(ii) Explain why magnalium is harder than aluminium.

(3)

Magnalium is harder than aluminium as its ~~Al~~ atoms have different shapes which break up the ~~perfect~~ perfect lattice and make it harder for the layers to slide over each other as they are not uniform in shape making them harder.

Paper 1C, Q14(f)(i) & (ii)

Student 1

(i) In an experiment, a student completely reacts 9.54 g copper(II) oxide.

Show that the maximum possible mass of $CuSO_4.5H_2O$ crystals that can be obtained is about 30 g.

[M_r of CuO = 79.5 M_r of $CuSO_4.5H_2O$ = 249.5]

Give your answer to an appropriate number of significant figures.

(3)

$\frac{9.45}{79.5}$

$= 0.119$

$CuO : CuSO_4 \cdot 5H_2O$

$1 : 1$

$0.119 : 0.119$

$0.119 \times 249.5 = 29.69$

mass = 29.69 g

(ii) In this experiment, the actual yield of $CuSO_4.5H_2O$ crystals is 23.92 g.

Calculate the percentage yield of $CuSO_4.5H_2O$

(2)

$\text{percent yield} = \frac{\text{actual yield}}{\text{theoretical yield}}$

$\text{percent yield} = \frac{23.92}{29.69} \times 100$

$= 80.6$

percentage yield = 80.6 %

Student 2

(i) In an experiment, a student completely reacts 9.54 g copper(II) oxide.

Show that the maximum possible mass of $CuSO_4.5H_2O$ crystals that can be obtained is about 30 g.

[M_r of CuO = 79.5 M_r of $CuSO_4.5H_2O$ = 249.5]

Give your answer to an appropriate number of significant figures.

(3)

1:1 ratio

$n = \frac{M}{Mr}$

$n = \frac{9.54}{79.5}$

$n = 0.12$

$n = \frac{M}{Mr}$

$0.12 = \frac{M}{249.5}$

$0.12 \times 249.5 = M$

$= 29.94$

$M = 29.94$

mass = 30.0 g

(ii) In this experiment, the actual yield of $CuSO_4.5H_2O$ crystals is 23.92 g.

Calculate the percentage yield of $CuSO_4.5H_2O$

(2)

$\frac{23.92}{29.94} \times 100 = 79.893\ \%$

79.9 %

percentage yield = 79.9 %

Student 3

(i) In an experiment, a student completely reacts 9.54 g copper(II) oxide.

Show that the maximum possible mass of $CuSO_4.5H_2O$ crystals that can be obtained is about 30 g.

[M_r of CuO = 79.5 M_r of $CuSO_4.5H_2O$ = 249.5]

Give your answer to an appropriate number of significant figures.

(3)

n of CuO = $\frac{9.54}{79.5}$

= 0.12

m g crystals = n × M_r

= 0.12 × 249.5

= 29.94 g

mass = 29.94 g

(ii) In this experiment, the actual yield of $CuSO_4.5H_2O$ crystals is 23.92 g.

Calculate the percentage yield of $CuSO_4.5H_2O$

(2)

$\frac{23.92}{29.94} \times 100 = 92.21...$

percentage yield = 92.21 %