



KS3 Science

Atomic Structure and Bond Energy

Mark Scheme

Time available: 26 minutes

Marks available: 26 marks

www.accesstuition.com

Mark schemes

- 1.** (a) (i) R and Z
letters may be in either order
both letters are required for the mark
- 1
- (ii) Q
- 1
- (iii) X
- 1
- (iv) L
- 1
- (v) M
- 1
- (b) 12
- 1
- (c) (i) 7 **or** VII
- 1
- (ii) R **or** Z
- 1
- [8]**
- 2.** (a) K^+
accept K^{1+} or K^{+1}
- 1
- (b) (i) O^{2-}
accept O^{--} or O^{-2}
- 1
- (ii) K_2O
accept correct charges in formula eg $K^+_2O^{2+}$
*do **not** accept $K^{-}_2O^{2+}$ **or** other formulae including the wrong charges*
*consequential marking applies here if P^+ has been given in part (a) or if an incorrect charge has been given in parts (a) **or** (b) (i)*
- 1

- (c) (i) MgF_2
accept $\text{Mg}^{2+}\text{F}^-_2$ 1
- (ii) MgO
accept 2MgO or $\text{Mg}^{2+}\text{O}^{2-}$
*do **not** accept ' Mg_2O_2*
consequential marking applies here if an incorrect charge has been given in part (b) (i) 1

[5]

3.

- (a) (i) F 1
- (ii) any **two** from
- A
 - B
 - C
- two** letters are required for the mark* 1
- (b) one positive **or** +1 **or** 1+
*accept 'B + **or** '+' **or** 'positive'*
*do **not** accept '1'* 1

[3]

4.

- (a) (i) oxygen-oxygen **or** O–O 1
- (ii) **Answers may be in either order**
- carbon-oxygen **or** C–O
accept 'oxygen–carbon'
*do **not** accept 'carbon dioxide'* 1
- hydrogen-oxygen **or** H–O
accept 'oxygen–hydrogen'
*do **not** accept 'water'* 1

(b) any **one** from

- heat is produced
accept 'the reaction is exothermic'
- the temperature goes up
*do **not** accept 'energy is released'*

1

[4]

5.

consequential marking applies in all parts of this question

(a) (i) 1600

accept '2 × 800'

1

(ii) 1840

accept '4 × 460'

1

(iii) -3440

the minus sign is required for the mark

***or** a statement that energy is evolved*

accept [answer to (a) (i) + answer to (a) (ii)]

1

(b) 2590

*do **not** accept '-2590'*

accept answer to (a) (iii) -850

1

(c) (i) 1590

accept '2590 - (2 × 500)'

accept answer to (b) - 1000

1

(ii) 397.5

accept '1590 ÷ 4'

accept answer to (c) (i), 4

1

[6]