Province of the
EASTERN CAPE
EDUCATION

OR TAMBO INLAND DISTRICT

GRADE 10

PHYSICAL SCIENCES (P2)

OCTOBER 2022

MARKING GUIDELINES

Stanmorephysics.com

MARKS: 100



These marking guidelines consists of 6 pages.

QUESTION 1

1.1 C✓✓
1.2 B✓✓
1.3 D✓✓
1.4 C✓✓
1.5 B✓✓
1.6 B✓✓
1.7 D✓✓ **[14]**

QUESTION 2

2.1 Measure of the average kinetic energy of the particles in a substance✓✓ (2)

2.2 30^0C✓ (1)

2.3.1 30-40 minutes ✓ (1)

2.3.2 0-5 minutes ✓ (1)

2.3.3 5-10✓ and 20-30 minutes ✓ (2)

2.3.4 During a phase change the heat energy supplied is used to overcome the intermolecular forces.✓ Therefore the average kinetic energy of the particles remains the same. ✓ (2)

[9]

QUESTION 3

3.1.1 Atoms with the same atomic number ✓but different mass number.✓ (2)

3.1.2 Relative atomic mass = $\frac{(69.5252 \times 60.4) \checkmark + (70.9249 \times 39.6)}{100}$ ✓

= 70.08✓ (3)

3.1.3 Ga ✓ (1)

3.2 a) 13✓ (1)

b) 13 ✓ (1)

c) 13✓ (1)

d) 10✓ (1)

e) 27✓ (1)

3.3.1 8 ✓ (1)

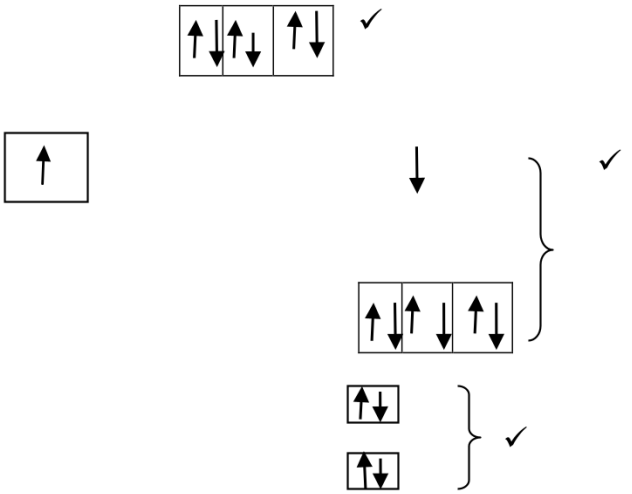
3.3.2 Period -3 ✓ (1)

3.3.3 3 ✓ (1)

3.3.4 Ar ✓ (1)

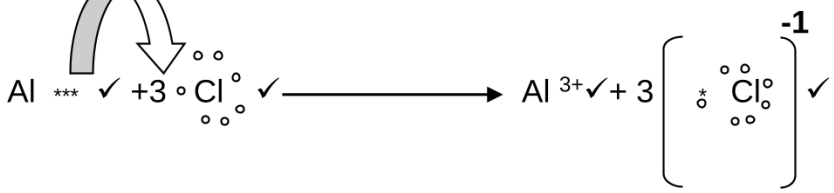
3.4 Ionic bond ✓ (1)

3.5



(3)

3.6



(4)

[23]

QUESTION 4

4.1.1 Mg ✓

4.1.2 O ✓

4.1.3 H ✓

4.1.4 F ✓

4.1.5 Si ✓ (5)

4.2.1 Energy released when an electron is added to an atom in the gaseous state to form an anion. ✓✓ (2)

4.2.2 $Cl + e^- \checkmark \rightarrow Cl^- + 349\ kJ\ mol^{-1}$ ✓ (2)

4.3 Ionisation energy ✓ (1)

4.4.1 Li_2O ✓✓ (2)

4.4.2 CaF_2 ✓✓ (2)

[14]

QUESTION 5

5.1 Copper(I) oxide. ✓✓ (2)

5.2 Synthesis reaction ✓ (1)

5.3 (4 x 63.5) + (2x16) ✓ = (4 x 63.5) + (2 x16) ✓

286 $g.mol^{-1}$ = 286 $g.mol^{-1}$ ✓ (3)

5.4.1 Number of moles of the solute per litre of the solution. ✓✓ (2)

5.4.2 $n = \frac{m}{M}$ ✓ $= \frac{20}{63.5}$ ✓ = 0.3149 mole

n (HCl) = 2 x 0.3149 = 0.6299 mole ✓

$c = \frac{n}{v}$ ✓

$c = \frac{0.6299}{0.25}$ ✓ = 2.59 $mol.dm^{-3}$ ✓ (6)

[14]

QUESTION 6

6.1 Experiment 1 ✓ (1)

6.2 New substances are formed ✓/ Bonds are broken and new bonds are formed (1)

6.3 $Fe_{(s)} + S_{(s)}$ ✓⟶ $FeS_{(s)}$ ✓ Balancing ✓ (3)

6.4 Separate the iron filings using a magnet✓ (1)

[6]

QUESTION 7

7.1 O_2 ✓ (1)

7.2  6 valence electrons ✓
Sharing 2 pairs ✓

(2)

7.3.1 $n = \frac{m}{M}$ ✓ $= \frac{10}{32}$ ✓ = 0.3125 moles ✓ (3)

7.3.2 n (SO_3) produced = 2 x 0.3125✓ = 0.625 moles

m (SO_3) produced = n x M✓ = 0.625 X 80✓ = 50g ✓ (4)

7.3.3 % yield = $\frac{\text{Actual yield}}{\text{Theoretical yield}}$ x 100 ✓= $\frac{40}{50}$ x 100 ✓= 80%✓ (3)

[13]

QUESTION 8

8.1 The simplest whole number ratio of elements in a compound. ✓✓ (2)

8.2

Element	g/100g	n = m/M	Simplest ratio
Na	**43.39**	**43.39 / 23 = 1.8867**✓	**2**
C	**11.32**	**11.32 / 12 = 0.9433** ✓	**1** ✓
O	**45.28**	**45.28 / 16 = 2.83** ✓	**3**

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Empirical formula is Na_2CO_3 ✓ (5)

[7]

[TOTAL 100 MARKS]