KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

PHYSICAL SCIENCES P2

FINAL EXAMINATION MARKING MEMORANDUM

NOVEMBER 2025

Stanmorephysics.com

MARKS: 100

DURATION: 2 hours

Copyright reserved

Downloaded

QUESTION 1:

1.1 A ✓✓ (2)
1.2 B ✓✓ (2)
1.3 D ✓✓ (2)
1.4 C ✓✓ (2)
1.5 C ✓✓ (2)
[10]

Stanmorephysics.com

QUESTION 2

2.1.1 Mixture ✓ (1)

2.1.2a) - 190°C ✓ (1)

2.1.2b) Y_2 ✓ (1)

2.1.2c) Physical (change). ✓
No new substance is formed. OR No chemical reaction took place. ✓ (2)

2.1.2d) Some of the XY would evaporate below its boiling point.✓ ✓ (2)

2.2.1 $2NH_3 + H_2SO_4 \rightarrow (NH_4)_2SO_4$
LHS ✓
RHS ✓
Balancing ✓ (3)

Stanmorephysics.com

2.2.2 Synthesis ✓ (1)

2.3.1 $$\%\ N = \frac{14 \times 2 \checkmark}{14 \times 2 + 1 \times 4 + 16 \times 3 \checkmark} \times 100$$
$= 35\ \%$ ✓ (3)

2.3.2 **POSITIVE MARKING FROM 2.3.1**
m (NH_4NO_3) = 30 ✓ ÷ 0,35 ✓
= 85,71 kg ✓ (3)

2.4 Mass of reactants = 4[14 + 1x3] + 5[16x2] ✓ = 228 g
Mass of products = 4[14 + 16] + 6[1x2 + 16] ✓ = 228 g
Mass of reactants is equal to the mass of products. Therefore mass is conserved. ✓ (3)

[20]

Copyright reserved

QUESTION 3

3.1.1 The movement of atoms or molecules ✓ from an area of higher concentration to an area of lower concentration. ✓ (2)

3.1.2 Ammonia diffuses faster than hydrochloric acid ✓ (1)

3.1.3 Decrease. ✓
At a higher temperature the particles move faster OR have more kinetic energy ✓.
Therefore, the gases diffuse faster. ✓ (3)

3.2.1 The temperature of a liquid at which its vapour pressure equals the external (atmospheric) pressure. ✓✓ (2)

3.2.2 - 85,1 ^{o}C ✓ (1)

3.2.3 (point) A✓ (1)

3.2.4 The temperature of HCl increase. ✓ The average kinetic energy of the particles increases. ✓ Particles move faster. ✓ (3)

[13]

QUESTION 4

4.1.1 Atoms of the same element having the same number of protons, but different number of neutrons. ✓✓ (2)

4.1.2 Let the % of Si – 29 be X.
The % of Si – 30 will be 7,8 – X

$$28{,}1 \checkmark = 28 \times \frac{92{,}2}{100} \checkmark + 29 \times \frac{X}{100} \checkmark + 30 \times \frac{7{,}8 - X}{100} \checkmark$$

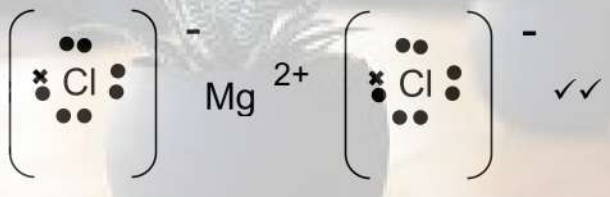
X = 5,6 % ✓ (5)

4.1.3 (a) =14 ✓
(b) = 14 ✓
(c) = 4 ✓ (3)

4.2.1 Ionic bonds ✓ (1)

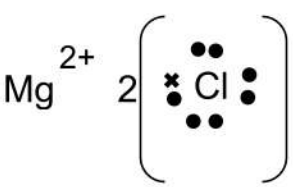
4.2.2 (2)

OPTION 1



✓✓

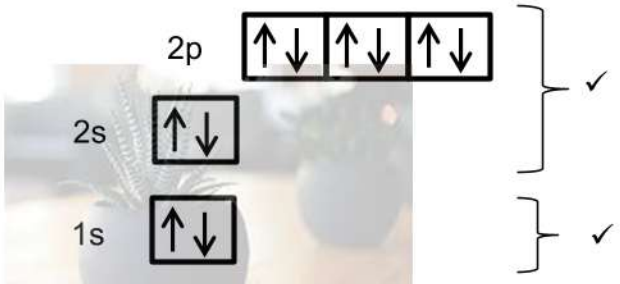
OPTION 2



✓✓

Copyright reserved

4.2.3 (2)



4.2.4 Argon ✓ (1)

4.3 Less than. ✓

- Both chlorine and magnesium are in the same period OR have the same number of energy levels. ✓
- The effective nuclear charge of chlorine is higher than magnesium. ✓
- The force of attraction between the nucleus and the outer orbital is stronger in chlorine. ✓ (4)

[20]

QUESTION 5

5.1 The number of moles of solute per cubic decimetre of solution. ✓✓ (2)

5.2 $n(Mg_3N_2) = \frac{m}{M}$ ✓

$= \frac{10}{24\times3+14\times2}$ ✓

$= 0,1$ mol ✓ (3)

5.3.1 **POSITIVE MARKING FROM 5.2**

$Mg_3N_2 : HCl$

1 : 6 ✓

$n(HCl) = 0,6$ mol

$c(HCl) = \frac{n}{V}$ ✓

$= \frac{0,6}{1,2}$ ✓

$= 0,5$ mol·dm^3 ✓ (4)

Copyright reserved

5.3.2 **POSITIVE MARKING FROM 5.2 AND 5.3.1**

$Mg_3N_2 : NH_3$ OR $HCl : NH_3$

1 : 2 ✓ OR 6 : 2 (or 3:1) ✓

$n(NH_3) = 0,2$ mol

$n(NH_3) = \frac{V}{V_m}$ ✓

$0,2 = \frac{V}{22,4}$ ✓

$V(H_2) = 4,48\ dm^3$ ✓ (4)

5.3.3 **POSITIVE MARKING FROM 5.2, 5.3.1 AND 5.3.2**

$Mg_3N_2 : MgCl_2$ OR $HCl : MgCl_2$ OR $NH_3 : MgCl_2$

1 : 3 ✓ OR 6 : 3 (or 2:1) ✓ OR 2 : 3 ✓

$n(MgCl_2) = 0,3$ mol

$n(MgCl_2) = \frac{N}{N_A}$ ✓

$0,3 = \frac{N}{6,02 \times 10^{23}}$ ✓

$N(MgCl_2) = 1,806 \times 10^{23}$ formula units

$N(Cl^-) = \underline{2\ x}$ ✓$1,806 \times 10^{23}$

$= 3,612 \times 10^{23}$ ions✓ (5)

[18]

Stanmorephysics.com

QUESTION 6

6.1

Marking criteria:

- Calculate the number of moles of each element (3 x 1 = 3) ✓✓✓
- Determine the simplest ratio of all elements ✓
- Multiplying by 2 ✓
- Final answer: $Mg_3P_2O_8$ ✓

Element	mass (g)	$n = \frac{m}{M}$	Simplest Ratio			
Mg	27,7	$\frac{27,7}{24} = 1,15$ ✓	$\frac{1,15}{0,76} = 1,51$	✓	x 2 ✓	3
P	23,6	$\frac{23,6}{31} = 0,76$ ✓	$\frac{0,76}{0,76} = 1$			2
O	48,7	$\frac{48,7}{16} = 3,04$ ✓	$\frac{3,04}{0,76} = 4$			8

Empirical Formula: $Mg_3P_2O_8$ ✓ (6)

Copyright reserved

Downloaded from Stanmorephysics.com

6.2.1 $M(K_2SO_4.7H_2O) = 39x2 + 32 + 16x4 + 7x18$ ✓

$= 300\ g.mol^{-1}$

OPTION 1

$c = \frac{m}{MV}$ ✓

$0,2 = \frac{m}{300(0,1)}$ ✓

$m = 6\ g$ ✓

OPTION 2

$c = \frac{n}{V}$ ✓

$0,2 = \frac{n}{0,1}$

$n(K_2SO_4.7H_2O) = 0,02\ mol$ ✓

$m = n \times M$

$= 0,02 \times 300$

$= 6\ g$ ✓

(4)

[10]

QUESTION 7

7.1

$$\%\ yield = \frac{actual\ yield}{theoretical\ yield} \times 100$$

$$85✓ = \frac{15✓}{theoretical\ yield} \times 100$$

$m(Cu)_{theoretical} = 17,65\ g$ ✓

OR

$m(Cu)_{actual} = m(Cu)_{theoretical} \times 0,85$

$15✓ = m(Cu)_{theoretical} \times 0,85$ ✓

(3)

7.2 **POSITIVE MARKING FROM 7.1**

Marking criteria:

- Divide by 63,5 ✓
- Ratio (2:3) ✓
- Formula: $n(Y) = \frac{m}{M}$ ✓
- Substitute n(Y) ✓
- Substitute 5g ✓

Final answer: Aluminium ✓

$n(Cu) = \frac{m}{M}$

$= \frac{17,65}{63,5}$ ✓

$= 0,278\ mol$

Y : Cu

2 : 3✓

$n(Y) = 0,185\ mol$

$n(Y) = \frac{m}{M}$ ✓

$0,185✓ = \frac{5✓}{M}$

$M(Y) = 27,03\ g$

Y is Aluminium ✓

(6)

[9]

TOTAL: **100**

Copyright reserved