education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

PHYSICAL SCIENCES: CHEMISTRY (P2)

JUNE 2024

MARKING GUIDELINES

MARKS: 75

This marking guideline consists of 6 pages including the cognitive grid.

QUESTION 1

1.1 C ✓✓
1.2 D ✓✓
1.3 B ✓✓
1.4 A ✓✓
1.5 B ✓✓

[10]

QUESTION 2

2.1 A substance that cannot be separated into simpler components by physical methods. ✓✓ (2)

2.2 2.2.1 Air ✓ (1)

2.2.2 Copper wire ✓ (1)

2.2.3 Bromine ✓ (1)

2.3 2.3.1 B ✓, C ✓, A ✓ (3)

2.3.2 Liquid ✓ (1)

[9]

QUESTION 3

3.1 Atoms of the same element having the same atomic number/number of protons, but different mass number/number of neutrons. ✓✓ (2)

3.2

3.2.1 $1s^2 2s^2 2p^6 3s^2 3p^5$ ✓✓ (2)

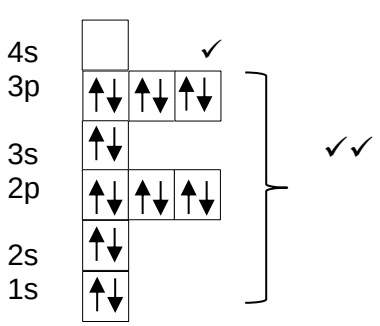
3.2.2 $M_r\ (C\ell) = \frac{35(75,77)\ ✓ + 37(24.23)\ ✓}{100}$
$M_r\ (C\ell) = 35,48$ AMU ✓ (3)

3.2.3 7 ✓ (1)

3.2.4 3 ✓ (1)

3.3

3.3.1 Ca^{2+}



(3)

3.3.2 Ca^{2+} and $C\ell^-$ ✓ (2)

3.4 Energy needed per mole to remove an electron(s) from an atom in the gaseous phase. ✓✓ (2)

3.5 3.5.1 Lithium is a metal that has an electron in the second energy level (1 valence electron). ✓ Its first energy level is full.
Fluorine has 7 electrons in its 2nd energy level (7 valence electrons). ✓
Lithium will rather donate and Fluorine will rather gain an electron. ✓
Therefore the difference in first ionisation energies. (3)

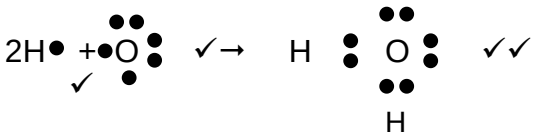
3.5.2 HIGHER THAN ✓ (1)
[20]

QUESTION 4

4.1 A pure substance that consists of two or more non-metal atoms chemically bonded together through the sharing of electrons. ✓✓ (2)

4.2 Chemical change ✓ (1)

4.3

4.3.1 

(4)

4.3.2 Covalent bond ✓ (1)

4.3.3 $HC\ell\ (aq) + MnO_2\ (s)$ ✓→ $MnC\ell_2\ (aq) + H_2O\ (\ell) + C\ell_2\ (g)$ ✓ ✓ (bal.)

Criteria:
If no phases are indicated or any phase(s) are wrong max $^2/_3$ (3)

4.4

4.4.1 Hydrogen sulphate ✓ (1)

4.4.2 Potassium chloride ✓ (1)

4.5 K^+ ✓+ HSO_4^- ✓→ $KHSO_4$ ✓(balancing) (3)

4.6 Ionic bond ✓ (1)

4.7 (39 + 35,5) ✓+ (2(1)+32+4(16)) ✓ = (39+1+32+4(16)) ✓ + (1+35,5) ✓
74,5 + 98 = 136 + 36,5
172,5 = 172,5 ✓ (5)

[22]

QUESTION 5

5.1 A mole of a substance is the same amount of particles as there is atoms in 12 g of the Carbon-12 isotope. ✓✓ (2)

5.2 5.2.1 $M(Na_2CO_3)$ = 2(23)+12+3(16) ✓
= 106 $g.mol^{-1}$ ✓ (2)

5.2.2 $N(HC\ell) = nN_A$ ✓
= 2 x 6,02 x 10^{23} ✓
= 1,204 x 10^{24} molecules ✓
∴ 2 x 1,204 x10^{24} = 2,408 x 10^{24} atoms ✓ (4)

5.2.3 **POSITIVE MARKING FROM 5.2.1**

$n = \frac{m}{M}$ ✓

$= \frac{243,8}{106}$ ✓

= 2,3 mol ✓ (3)

5.2.4 $n(CO_2) = \frac{V}{V_m}$ ✓

$1,15 = \frac{V}{22,4}$ ✓

$V(CO_2)$ = 25,76 dm^3 ✓ (3)

[14]

TOTAL: 75

SUBJECT:	PHYSICAL SCIENCES				ASSESSMENT TASK:	JUNE EXAMINATION PA					
QUESTION ANALYSIS GRID										DATE:	
		Cognitive Levels									
QUESTION	Mark	1	2	3	4	States of matter and KMT	The atom	The Periodic table	Chemical bonding	Physical and chemical change	Quantitative	TOTAL
1.1.1	2		2			2						2
1.1.2	2			2				2				2
1.1.3	2		2						2			2
1.1.4	2				2					2		2
1.1.5	2		2								2	2
Ques 1	10	0	4	2	0	2	0	2	2	0	0	10
2.1	2	2				2						2
2.2.1	1		1			1						1
2.2.2	1		1			1						1
2.2.3	1		1			1						1
2.3.1	3				3	3						3
2.3.2	1			1		1						1
Ques 2	9	2	3	1	3	9	0	0	0	0	0	9
3.1	2	2					2					2
3.2.1	2		2				2					2
3.2.2	3				3		3					3
3.2.3	1		1				1					1
3.2.4	1		1					1				1
3.3.1	3			3			3					3
3.3.2	2		2				2					2
3.4	2	2						2				2
3.5.1	3			3				3				3
3.5.2	1				1			1				1
Ques 3	20	4	6	6	4	0	13	7	0	0	0	20
4.1	2	2							2			2
4.2	1		1							1		1
4.3.1	4			4					4			4
4.3.2	1								1			1
4.3.3	3			3						3		3
4.4.1	1		1							1		1
4.4.2	1		1							1		1
4.5	3		3						3			3
4.6	1		1						1			1
4.7	5			5						5		5
Ques 4	22	2	7	12	0	0	0	0	11	11	0	22
5.1	2	2									2	2
5.2.1	2		2								2	2
5.2.2	4			4							4	4
5.2.3	3			3							3	3
5.2.4	3			3							3	3
Ques 5	14	2	2	10	0	0	0	0	0	0	14	14
SUMMARY												
QUES 1	10	0	4	2	0	2	0	2	2	0	0	10
QUES 2	9	2	3	1	3	9	0	0	0	0	0	9
QUES 3	20	4	6	6	4	0	13	7	0	0	0	20
QUES 4	22	2	7	12	0	0	0	0	11	11	0	22
QUES 5	14	2	2	10	0	0	0	0	0	0	14	14
Total marks	75	10	22	31	7	11	13	9	13	11	14	75
Norm marks	75	11	26	30	7,5	9	10	9	12	23	12	75
Total %	100	89	84	103	93	122	130	100	108	48	117	100
Norm %	100	15	40	35	10							0