GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION/ *PROVINSIALE EKSAMEN*

JUNE/*JUNIE* 2024

GRADE/*GRAAD* 11

MARKING GUIDELINES/ *NASIENRIGLYNE*

PHYSICAL SCIENCES: (CHEMISTRY) PAPER 2
FISIESE WETENSKAPPE: (CHEMIE) VRAESTEL 2

6 pages/*bladsye*

QUESTION 1/*VRAAG 1*

1.1 C ✓✓ (2)

1.2 D ✓✓ (2)

1.3 C ✓✓ (2)

1.4 B ✓✓ (2)

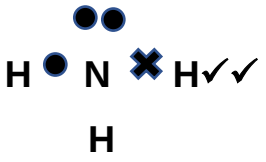
[8]

QUESTION 2/*VRAAG 2*

2.1 2.1.1 A lone pair is a pair of electrons in the valence shell of an atom that is <u>not shared</u> with another atom. ✓✓/
Alleenpaar is 'n paar elektrone in die valensievlak van 'n atoom wat <u>nie</u> met 'n ander atoom <u>gedeel</u> word <u>nie</u>. ✓✓ (2)

2.1.2 A covalent bond✓ is a <u>sharing</u> of electrons between two atoms to form a molecule. ✓✓/
'n Kovalente binding✓ is wanneer atome elektrone deel om 'n molekule te vorm. ✓✓ (3)

2.1.3



✓✓ (2)

2.1.4 Trigonal pyramid ✓✓/*Trigonaal piramidaal* ✓✓ (2)

2.2 2.2.1 8 ✓✓ (2)

2.2.2 Covalent bond ✓✓/*Kovalente binding* ✓✓ (2)

2.3 Phosphine (PH_3) has dipole-dipole forces ✓ while Ammonia (NH_3) has hydrogen bonds. ✓
Dipole-dipole is weaker than hydrogen bonds. ✓/
Fosforhidried (PH_3) het dipool-dipool kragte ✓terwyl Ammoniak (NH_3) waterstofbindings het. ✓✓
Dipool-dipool kragte is swakker as waterstofbindings ✓

OR/*OF*

Ammonia (NH_3) has hydrogen bonds ✓ while Phosphine (PH_3) has dipole-dipole forces.✓ Hydrogen bonds are stronger than dipole-dipole forces. ✓/
Ammoniak (NH_3) het waterstofbindings ✓terwyl Fosforhidried (PH_3) dipool-dipool kragte het. ✓Waterstofbindings is sterker as dipool-dipool kragte. ✓ (3)

[16]

QUESTION 3/*VRAAG 3*

3.1 Electronegativity is a measure of the tendency of an atom in a molecule to attract bonding electrons. ✓
Elektronegatiwiteit is 'n maatstaaf van die neiging van 'n atoom in 'n molekule om bindingselektrone aan te trek. ✓✓ (2)

3.2 Group IV, ✓ can form 4 bonding pairs ✓ with no lone pair or has a valency of four./
Groep IV, ✓*kan 4 bindingspare vorm* ✓*met geen alleenpare of dit het 'n valensie van vier.* (2)

3.3 C/carbon atom ✓/
C/koolstofatoom (1)

3.4 Non-polar,✓ the bonds between C and O atoms are polar, ✓ but the molecule is symmetrically shaped/ even distribution of electrons around the molecule.
Nie-polêr, ✓*die bindings tussen C en O atome is polêr,* ✓ *maar die molekule is simmetries in vorm/ eweredige verspreiding van elektrone rondom die molekule.* (2)

3.5 Bond energy is the energy needed to break one mole of its molecules into separate atoms. ✓✓/
Bindingsenergie is die energie wat nodig is om een mol molekules op te breek in aparte atome. ✓✓ (2)

3.6 As the bond length increases, the bond energy decreases. ✓✓/
Soos die bindingslengte toeneem, sal die bindingsenergie afneem. ✓✓

OR/*OF*

As the bond length decreases, the bond energy increases. ✓✓
Soos die bindingslengte afneem, sal die bindingsenergie toeneem. ✓✓ (2)
[11]

QUESTION 4/*VRAAG 4*

4.1 The temperature at which the vapour pressure of a substance equals atmospheric pressure. ✓✓
Die temperatuur waarby die dampdruk van 'n stof gelyk is aan die atmosferiese druk. ✓✓ (2)

4.2
- NH_3 and H_2O has Hydrogen bonds, while the rest has dipole-dipole forces ✓
- Hydrogen bonds are much stronger than dipole dipole forces ✓
- Thus more energy will be needed to overcome the hydrogen bonds than the dipole-dipole forces. ✓/
- *NH_3 en H_2O het Waterstofbindings, terwyl die res dipool-dipool kragte het* ✓
- *Waterstofbindings is sterker as dipool-dipool kragte* ✓
- *Dus word meer energie benodig om die waterstofbindings te oorkom as om dipool-dipoolkragte te oorkom.* ✓ (3)

4.3 4.3.1 Dipole-dipole forces ✓/
Dipool-dipool kragte ✓ (1)

4.3.2
- All had dipole-dipole forces./
- The molecular mass increases as you go down in the groups. ✓
- As the molecular mass increases the strength of the dipole-dipole forces increases. ✓/
- *Almal het dipool-dipool kragte.* ✓
- *Die molekulêre massa neem toe soos wat daar afbeweeg word in die groep.* ✓
- *Indien die molekulêre massa toeneem sal die sterkte van die dipool-dipool kragte toeneem.* ✓ (2)

4.3.3 H_2Te ✓ (1)

4.4 4.4.1 $C\ell_2$, – London forces ✓/*London kragte*✓
SO_2 – Dipole-dipole forces ✓/*Dipool-dipool kragte*✓
NaBr – Ionic bonds/Electrostatic forces ✓/*Ioniese binding/ Elektrostatiese kragte*✓ (3)

4.4.2 $C\ell_2$ ✓
– the substance with the weakest intermolecular forces ✓will have the lowest boiling point and therefore the highest vapour pressure. ✓/
– die stof met die swakste intermolekulêre kragte ✓*sal die laagste kookpunt hê en daarom die hoogste dampdruk.* ✓ (3)
[15]

TOTAL/*TOTAAL*: 50

Taxonomy

Weighting of Topics

Question	Atomic combinations	Intermolecular forces			Question Total
1	4	4			**8**
2	13	3			**16**
3	11				**11**
4		17			**15**
5					
6					
7					
8					
Total Mark	28	24			**50**
Actual					**100%**
Target					**100%**

	Cognitive Levels			
Question no:	**Knowing science**	**Understanding science**	**Applying scientific knowledge**	**Evaluating, analysing, synthesising**
1.1		2		
1.2		2		
1.3		2		
1.4			2	
2.1.1	2			
2.1.2		3		
2.1.3		2		
2.1.4		2		
2.2.1		2		
2.2.2		2		
2.3		3		
3.1	2			
3.2		2		
3.3			1	
3.4				2
3.5	2			
3.6			2	
4.1	2			
4.2		3		
4.3.1		1		
4.3.2			2	
4.3.3		1		
4.4.1		3		
4.4.2			3	
Total Mark	08	30	10	02
REQUIRED	15 %	35 %	40 %	10 %