Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

GRADE/



PHYSICAL SCIENC Y (P2)
FISIESE WETENSI E (V2)

JUNE 2025

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 75

These marking guidelines consist of 6 pages.
Hierdie nasienriglyne bestaan uit 5 bladsye.

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QUESTION 1/*VRAAG 1*

1.1 D ✓✓ (2)

1.2 D ✓✓ (2)

1.3 B✓✓ (2)

1.4 C ✓✓ (2)

1.5 C ✓✓ (2)

[2 x 5 = 10]



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QUESTION 2/*VRAAG 2*

2.1.1 7/seven/*sewe* ✓ (1)

2.1.2 1/one/*een* ✓ (1)

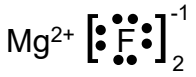
2.2 A covalent bond is the sharing of electrons between two atoms to form a molecule. ✓✓
'n Kovalente binding is die deel van elektrone tussen twee atome om 'n molekuul te vorm. ✓✓ (2)

2.3.1 Ionic/Electrostatic ✓
Ionies/*Elektrostaties* ✓ (1)

2.3.2 Covalent/*Kovalent* ✓ (1)

2.4.1  ✓✓ (2)

2.4.2  ✓✓ (2)

2.4.3 

(The 2 can be in front of the F)



Marking crit
- Mag… */Magnesium met geen elek…*
- Flou… …nded by eight electrons./Fluoor met … agt elektrone. ✓
- Both charges and number of fluorine ions correct./*Albei ladings en aantal fluoor ione korrek.* ✓

(3)

2.5.1 POLAR ✓,Angular✓/*POLĘR* ✓,*Hoekig* ✓ (2)

2.5.2 NON-POLAR ✓Tetrahedral✓/ *NIE-POLĘR*✓ *Tetraëdriese*✓ (2)

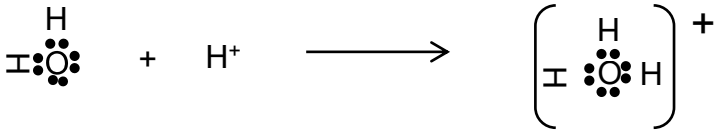
2.5.3 POLAR ✓ Trigonal-pyramidal✓/ *POLĘR* ✓*Trigonaal-piramidaal*✓ (2)

2.6 Boron/central atom has no lone pair of electrons✓ while nitrogen/central atom has one lone pair of electrons. ✓
Therefore flourine atoms are arranged symmetrically around the boron atom.✓
OR
The lone pair of electrons in nitrogen push the hydrogen atoms down.

Boor/sentrale atoom het geen alleenpaar elektrone nie✓ terwyl stikstof/sentrale atoom een alleenpaar elektrone het. ✓
Daarom is fluoor atome simmetries rondom die boor atoom gerangskik. ✓
OF
Die alleenpaar elektrone in stikstof druk die waterstofatome af. ✓ (3)

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2.7



Marking criteria/*Nasienkriteria*

- Lewis Diagram of water correct./*Lewis Diagram van water korrek.* ✓
- Hydrogen ion with no electrons and correct charge./*Waterstof ioon met geen elektrone en korrekte lading.* ✓
- Dative covalent bond illustrated correctly./*Datief-kovalente binding korrek.* ✓
- Brackets with correct charge outside the brackets./*Block hakkies met korrekte lading buite hakkies* ✓

(4)
[25]

QUESTION 3/*VRAAG 3*

3.1 The energy needed to break one mole of its molecules into separate atoms./*Die energie benodig om een mol van sy molekules in aparte atome op te breek*. ✓✓ (2)

3.2.1 Attractive forces between the protons of one atom and the electrons of the other / the unlike charges of each atom./*Aantrekkingskrag tussen die protone van een atom, en die ele…der / twee atome se teenoorgestelde ladings*. ✓ (1)

3.2.2 Repulsive forces between the pr…s and the electrons of both atoms / two atoms like char… *tussen die protone van beide atome en die elektrone va…e atome se soortgelyke ladings.* ✓ (1)

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3.3.1 <u>235 kJ·mol^{-1}</u> ✓ (No mark is awarded for negative answer./*Geen punt word toegeken vir negatiewe antwoord.)* (1)

3.3.2 <u>75 pm/75 x 10^{-12}m</u> ✓ (1)

3.4. Nitrogen atoms are larger than hydrogen atoms./Hydrogen atoms are smaller than nitrogen atoms ✓✓
Stikstof atome is groter as waterstof atome./Waterstof atome is kleiner as stikstof atome✓✓. (2)

3.5 <u>N_2 has a triple bond between the two nitrogen atoms</u> while H_2 has a single bond between the two hydrogen atoms. ✓✓ OR
N2 has a higher bond order than H.
GROOTER AS ✓
<u>*N_2 het 'n trippel binding tussen die twee stiksto atome*</u>, *terwyl H_2 'n enkel binding tussen die twee waterstof atome het.* ✓ (2)

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3.6 When the nuclei of the atoms get too close to eachother✓, the atoms start to repel. ✓ Potential energy starts to increase. ✓
Wanneer die kerne van die twee atome te naby aan mekaar kom ✓stoot die atome mekaar af. ✓ Potensiële energie neem toe. ✓ (3)
[13]

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QUESTION 4/*VRAAG 4*

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

4.1.2 Type of hydride or Relative <u>molecular mass</u>/*Tipe hydride of Relatiewe <u>atoommassa</u>* ✓ (1)

4.1.3 $\Delta EN = 2,1 - 1,8$✓
$= 0,3$ ✓
∴ polar covalent/*polêr kovalent* ✓ (3)

4.1.4 SnH_4 ✓ (1)

4.1.5 CH_4 ✓ (1)

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4.1.6
- SiH_4 and CH_4 both have London forces/Induced dipole - induced dipole/Dispersion forces ✓
- SiH_4 has stronger intermolecu… has a larger relative molecular mass./CH_4 has wea… ces because it has a smaller relative molecular mas…
- More energy will be needed to … cular forces between SiH_4 molecules./Less energy will be … intermolecular forces between CH_4 molecules.✓
- *SiH_4 en CH_4 het albei London … dipool - geïnduseerde dipool/Dispersiekragte.* ✓
- *SiH_4 het sterker intermolekulê kragte aangesien dit 'n grooter realtiewe molekulêre massa het./CH_4 het swakker intermolekulêre kragte aangesien dit 'n kleiner relatiewe molekulêre massa het.* ✓
- *Meer energie word benodig om die intermolekulêre kragte tussen SiH_4 molekules te breek./Minder energie word benodig om die intermolekulêre kragte tussen CH_4 molekules te breek.* ✓ (3)

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4.2.1 There is an increase in boiling point as the relative molecular mass increases./ *Daar is 'n toename in kookpunt soos die relatiewe molekulêre massa toeneem.* ✓✓ (2)

4.2.2
- All the molecules have dipole-dipole/Van die Waals forces ✓
- Van der Waals forces increase with an increase in relative molecular mass. ✓
- More energy will be needed to break the intermolecular forces between molecules with a larger relative molecular mass.✓
- *Al die molekules het dipool-dipool kragte/Van der Waals kragte.* ✓
- *Die sterkte van Van der Waals kragte neem toe met 'n toename in relatiewe molekulêre massa* ✓
- *Meer energie word benodig om die intermolekulêre kragte te breek tussen molekules met 'n groter molekulêre massa.*✓ (3)

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4.2.3 W is oxygen/O. ✓
It has a boiling point of 100°C **OR** It has a molecular mass of 18 g·mol^{-1}. ✓

W is Suurstof/O. ✓
Dit het 'n kookpunt van 100°C ***OF*** *Dit het 'n relatiewe molekulêre massa van 18 g·mol^{-1}.* ✓

(2)

4.2.4 H_2W has strong hydrogen bonds, while the other molcules have dipole-dipole forces. ✓

Hydrogen bonds are stronger than dipole-dipole bonds. ✓
OR
Dipole-dipole bonds are weaker than hydrogen bonds. ✓

H_2W het sterk waterstofbindings, terwyl die ander molekules dipool-dipool kragte besit. ✓

Waterstof bindings is sterker as dipool-dipool kragte. ✓
OF
Dipool-dipool bindings is swakker [illegible] *gs.* ✓ (2)

[20]

QUESTION 5/*VRAAG 5*

5.1 Solubility is the ability of a solid, l[illegible]hemical to dissolve in solvent and form a solution. ✓✓
Oplosbaarheid is die vermoë van 'n vastestof, vloeibare of gasvormige chemikalie om in oplosmiddel op te los en 'n oplossing te vorm. (2)

5.2 No.✓
Iodine chrystals are non-polar ✓and have weak London forces/Induced dipole - induced dipole/Dispersion forces. ✓
Water molecules are polar ✓and form strong hydrogen bonds. ✓

Nee✓
Jodium kristalle is nie-poler, ✓*en het swak London kragte/Geïnduseerde dipool - geïnduseerde dipool/Dispersiekragte.* ✓
Water molekules is polêr✓ *en besit sterk waterstofbindings.* ✓ (5)
[7]

TOTAL/*TOTAAL*: 75

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