education

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REPUBLIC OF SOUTH AFRICA

FURTHER EDUCATION AND TRAINING
VERDERE ONDERWYS EN OPLEIDING

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GRADE/GRAAD 11

PHYSICAL SCIENCES P2/FISIESE WETENSKAPPE V2

JUNE/JUNIE 2025

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE 50

These marking guidelines consist of 10 pages.

Hierdie nasienriglyne betstaan uit 10 bladsye.

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Please turn over/Blaai asseblief om

QUESTION / VRAAG 1

1.1 B✓✓ (2)

1.2 D✓✓ (2)

1.3 C✓✓ (2)

[6]

QUESTION / VRAAG 2

2.1 A mutual attraction between two atoms resulting from the simultaneous attraction between their nuclei and the outer electrons.✓✓

'n Wedersydse aantrekking tussen twee atome as gevolg van die gelyktydige aantrekking tussen hul kerne en die buite / valenselektrone.

[If any of the underlined key words/phrases in the correct context are omitted; deduct 1 mark. / Indien enige van die onderstreepte woorde / frases in die korrekte konteks uitgelaat is, trek 1 punt af.] (2)

2.2 HIGHER / HOëR ✓

The (potential) energy of F_2/combined atoms is lower than that of individual (F) atoms.✓

Die (potensiële) energie van F_2/gekombineerde atome is ler as die individuele (F) atome. (2)

2.3.1 ✓✓

Marking criteria / Nasienriglyn	
Symbols of both F atoms with two electrons shown as dots/crosses between them. Simbole van beide F atome met twee elektrone as kolletjies / kruisies tussen hulle.	✓
Six lone pairs placed around F atoms. Ses alleenpare rondom die F atome.	✓

(2)

2.3.2 6 ✓ (1)

2.4.1 

Marking criteria / Nasienriglyn	
Correct shape of / Korrekte vorm van NH_3	✓
Correct formula of / Korrekte formule van H^+	✓
Correct shape of / Korrekte vorm van NH_4^+	✓✓

(4)

2.4.2 Trigonal pyramidal / Trigonaal piramidaal ✓ (1)

[12]

QUESTION / VRAAG 3

3.1 The energy needed to break one mole of the compound's molecules into separate atoms. / Die energie benodig om 1 mol van 'n verbinding se molekules op te breek in atome. ✓✓
[2 or 0 marks / 2 of 0 punte] (2)

3.2.1 As the bond length increases, the bond energy decreases.✓
OR: As the bond length decreases, the bond energy increases.
Soos die bindingslengte toeneem, sal die bindingsenergie afneem.
OF: Indien die bindingslengte afneem, sal die bindingsenergie toeneem. (1)

3.2.2 Bonds with longer bond lengths have lesser forces of attraction,✓and require lesser energy to break.✓
OR: Bonds with shorter bond lengths have greater forces of attraction,✓and require more energy to break.✓

Bindings met langer bindingslengtes het swakker aantrekkingskragte, en benodig minder energie om te breek.
OF: Bindings met korter bindingslengtes het sterker aantrekkingskragte, en benodig meer energie om te breek. (2)

3.3.1 In C=O there is a double bond / atoms are closer / bond length is shorter. ✓
Therefore, the bond strength is higher.✓

In C=O is daar 'n dubbelband / atome is nader aan mekaar / bindingslengte is korter. Daarom is die binding sterker. (2)

3.3.2 The electronegativity difference in C=O (3,5 –2,5) is 1,0 (which makes the bonds polar).✓
The charge (electron density) distribution in a molecule is even/ the charge distribution is symmetrical.✓
There is no net dipole moment/ net dipole moment is zero.✓

Die verskil in elektronegatiwiteit in C=O (3,5 –2,5) is 1,0 (daarom is die bindings polêr.)
Die ladingsverspreiding (elektrondigtheid) is simmetries.
Daar is geen netto dipoolmoment nie / die netto dipoolmoment is zero. (3)

[10]

QUESTION / VRAAG 4

4.1.1 Induced dipole forces / London forces ✓
Geïnduseerde dipoolkragte / London kragte (1)

4.1.2 Covalent bonding / Kovalente binding ✓ (1)

4.1.3 Interatomic forces / Interatomiese kragte ✓ (1)

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4.2.1 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 omringende atmosferiese druk.
[If any of the underlined key words / phrases in the correct context are omitted; deduct 1 mark / Indien enige van die onderstreepte woorde / frases in die korrekte konteks uitgelaat is, trek 1 punt af.] (2)

4.2.2 Molecular mass / Molekulêre massa ✓ (1)

4.2.3 **OPTION / OPSIE 1**
Boiling point increases with an increase in molecular mass. ✓
Kookpunt neem toe met 'n toename in molekulêre massa.

OPTION / OPSIE 2
Boiling point decreases with a decrease in molecular mass. ✓
Kookpunt neem af met 'n afname in molekulêre massa. (1)

4.2.4 **OPTION / OPSIE 1**

- As the molecular mass increases, the strength of intermolecular forces / van der Waals forces / induced dipole forces / London forces increases. ✓
- The energy needed to separate the molecules / to overcome the intermolecular forces / van der Waals forces / induced dipole forces / London forces increases. ✓
- As die molekulêre massa toeneem, sal die sterkte van die intermolekulêre kragte / van der Waals kragte / geïnduseerde dipoolkragte / London kragte toeneem.
- Die energie wat die molekules benodig om die intermolekulêre kragte / van der Waals kragte / geïnduseerde dipoolkragte / London kragte te oorkom neem toe.

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OPTION / OPSIE 2

- As the molecular mass decreases, the strength of intermolecular forces / van der Waals forces / induced dipole forces / London forces decreases. ✓
- As die molekulêre massa afneem, sal die sterkte van die intermolekulêre kragte / van der Waals kragte / geïnduseerde dipoolkragte / London kragte afneem.
- The energy needed to separate the molecules / to overcome the intermolecular forces / van der Waals forces / induced dipole forces / London forces decreases. ✓
- Die energie wat die molekules benodig om die intermolekulêre kragte / van der Waals kragte / geïnduseerde dipoolkragte / London kragte te oorkom neem af.

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(2)

4.2.5 **OPTION / OPSIE 1**

CORRECT / REG ✓

- Between molecules of E / H_2O there are hydrogen bonding, and between molecules of F / H_2S there are dipole-dipole forces. ✓
- Dipole-dipole forces are weaker than hydrogen bonding. ✓

- Tussen die molekules van E / H_2O is daar waterstofbinding, en tussen die molekules van F/ H_2S is daar dipool-dipool kragte.
- Dipool-dipool kragte is swakker as waterstofbinding.

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OR / OF: Intermolecular forces in F / H_2S are weaker than between E / H_2O.
Intermolekulêre kragte tussen F / H_2S is swakker as tussen E / H_2O.

- Less energy is needed to overcome dipole-dipole forces (than hydrogen bonding) ✓

- Minder energie word benodig om dipool-dipoolkrgate te oorkom (as waterstofbinding)

OR / OF: Less energy is needed to overcome Intermolecular forces in F / H_2S than in E / H_2O.
Minder energie word benodig om die intermolekulêre in F / H_2S te oorkom as in E/ H_2O.

OR / OF: Less energy is needed to separate the molecules of F / H_2S (than the molecules of E / H_2O.)
Minder energie word benodig om molekules van F / H_2S te skei, as die molekules van E / H_2O.

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OPTION / OPSIE 2

CORRECT/REG ✓

- Between molecules of E/ H_2O there are hydrogen bonding, and between molecules of F/ H_2S there are dipole-dipole forces✓
- Hydrogen bonding are stronger than dipole-dipole forces✓
- Tussen die molekules van E / H_2O is daar waterstofbinding, en tussen die molekules van F/ H_2S is daar dipool-dipool kragte.
- Waterstofbinding is sterker as dipool-dipoolkragte.

OR/OF: Intermolecular forces in E / H_2O are stronger than in F/ H_2S.
Intermolekulêre kragte tussen E / H_2O is sterker as tussen F / H_2S.

- More energy is needed to overcome hydrogen bonding (than dipole-dipole forces)✓

- Meer energie word benodig om waterstofbinding te oorkom (as dipool-dipoolkragte)

O /OF: More energy is needed to overcome Intermolecular forces in E / H_2O (than Intermolecular forces in F/ H_2S)
Meer energie is nodig om Intermolekulêre kragte in E / H_2O te oorkom (as Intermolekulêre kragte in F / H_2S)

OR/ OF: More energy is needed to separate the molecules of E/ H_2O (than the molecules of F / H_2S.) (4)
Meer energie word benodig om die molekules van E / H_2O te skei (as die molekules van F / H_2S.)

[13]

QUESTION /VRAAG 5

5.1 The property of a solid, liquid or gaseous chemical substance (solute) to dissolve in a solid, liquid or gaseous solvent to form a homogenous solution.✓✓

Die eienskap van 'n vaste stof, vloeistof of gas (opgeloste stof) om op te los in 'n vaste stof, vloeistof of gas (oplosmiddel) om 'n homogene oplossing te vorm.

[If any of the underlined key words/phrases in the correct context are omitted; deduct 1 mark / Indien enige van die onderstreepte woorde / frases in die korrekte konteks uitgelaat is, trek 1 punt af.] (2)

5.2.1 CRYSTALS ARE NOT SOLUBLE / KRISTALLE LOS NIE OP NIE ✓ (1)

5.2.2 CRYSTALS ARE SOLUBLE / KRISTALLE LOS OP ✓

•Water molecules are held together by strong hydrogen bonding. ✓
Watermolekules word deur sterk waterstofbinding bymekaar gehou.

•The ions in sodium chloride are held together by strong ion-dipole forces. ✓
Die ione in natriumchloried word deur ioon-dipoolkragte bymekaar gehou.

• Sodium chloride is soluble in water because the forces are in the same order of strength/ are of comparable strength. ✓
Natriumchloried is oplosbaar in water want die kragte is van dieselfde grootte orde / vergelykbare sterkte. (4)

5.3.1 Induced dipole forces / London forces. ✓
Geïnduseerde dipool kragte / London kragte. (1)

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5.3.2 Intermolecular forces / van der Waals forces between iodine and water molecules are not of comparable strenghths.✓
Intermolekulêre kragte / van der Waals kragte tussen jodium en watermolekules is NIE van vergelykbare sterkte NIE.

OR/ OF: Induced dipole forces / London forces between iodine and hydrogen bonding in water are not of comparable strenghth.
Geïnduseerde dipool kragte / London kragte tussen jodium en waterstof binding in water is NIE van vergelykbare sterkte NIE.

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OR/ OF: Substances dissolve in each other only if their Intermolecular forces / van der Waals forces are of comparable strenghths.
Stowwe sal oplos indien hul intermolekulêre kragte / van der Waals kragte van vergelykbare grootte is. (1)

[9]

GRAND TOTAL 50
GROOTTOTAAL 50

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