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PROVINCIAL ASSESSMENT *PROVINSIALE ASSESSERING*

GRADE/GRAAD 12

TECHNICAL SCIENCES P2/TEGNIJSE WETENSKAPPE V2

JUNE/JUNIE 2025

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 75

These marking guidelines consists of 7 pages.
Hierdie nasienriglyne bestaan uit 7 bladsye



QUESTION/VRAAG 1:

- 1.1 C ✓✓ (2)
- 1.2 A ✓✓ (2)
- 1.3 C ✓✓ (2)
- 1.4 B ✓✓ (2)
- 1.5 A ✓✓ (2)

[10]**QUESTION/VRAAG 2**

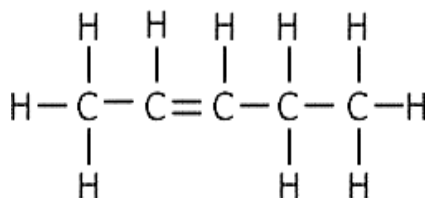
- 2.1 2.1.1 Organic compounds containing only carbon atoms and hydrogen
✓✓
Organiese verbindings wat slegs koolstofatome en waterstofatome bevat. (2)
- 2.1.2 An atom or a group of atoms that determine the chemistry of a molecule ✓✓
- OR**
- An atom or group of atoms that determine(s) the physical and chemical properties of a group of organic compounds
- 'n Atoom of 'n groep atome wat die chemie van 'n molekule bepaal*
- OF**
- 'n Atoom of 'n groep atome wat die fisiese en chemiese eienskappe van 'n groep organiese verbindings bepaal* (2)
- 2.2 2.2.1 **A** ✓ and **B** ✓ (2)
- 2.2.2 **F** ✓ (1)
- 2.2.3 **E** ✓ (1)
- 2.2.4 **C** ✓ and **D** ✓ (2)
- 2.3 2.3.1 Butan ✓-2-ol ✓ (2)
- 2.3.2 Propanone/Propanoon ✓✓ (2)
- 2.3.3 Ethyl ✓ propanoate ✓
Etiel propanoaat (2)
- 2.4 2.4.1 $C_nH_{2n}O$ ✓ (1)



2.4.2 $C_nH_{2n}O_2$ ✓

(1)

2.5 2.5.1

**Marking criteria**

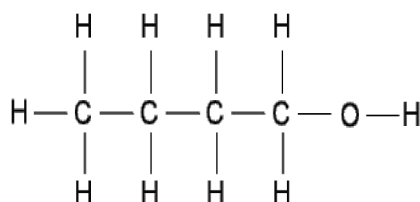
- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

Nasien kriteria

- ✓ Korrekte funksionele groep
- ✓ Hele struktuur korrek
- Indien 'n verbinding of waterstof kort ½

(2)

2.5.2

**Marking criteria**

- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

Nasien kriteria

- ✓ Korrekte funksionele groep
- ✓ Hele struktuur korrek
- Indien 'n verbinding of waterstof kort ½

(2)

2.6 A large molecule composed of smaller monomer units covalently bonded to each other in a repeatly pattern. ✓✓

'n Groot molekule wat uit kleiner monomeer-eenhede bestaan wat kovalent aan mekaar in 'n herhalende patroon gebind is

(2)

2.7 Polythene/Politeen ✓

(1)

[25]

QUESTION/VRAAG 3

- 3.1 The pressure exerted by a vapour at equilibrium with it's liquid in a closed system. ✓✓

Die druk uitgeoefen deur 'n damp in ewewig met sy vloeistof in 'n geslote sisteem. Hoe sterker die intermolekulêre kragte, hoe laer die dampdruk. (2)

- 3.2 Primary alcohol ✓

The (-OH) hydroxyl group is attached to a primary carbon. ✓

OR

The hydroxyl group (-OH) is bonded to only one other carbon atom.

Primêre alkohol

Die (-OH) hidroksied groep is op die primêre koolstof

OR

Die hidrosiel groep (-OH) is verbind met slegs een ander koolstofatoom. (2)

- 3.3 3.3.1 Dispersion/London Forces ✓

Dispersie/London Kragte (1)

3.3.2 Hydrogen bond/Waterstofverbindings ✓ (1)

- 3.4 Compound **A** / Propane ✓

*Verbinding **A** / Propaan* (1)

- 3.5 Ethanoic acid ✓

Etanoësuur (1)

- 3.6 Consists of TWO sites for hydrogen bonding ✓ and has stronger intermolecular force than compound **A** and **B**. ✓

OR

The stronger the intermolecular forces, the higher the boiling point. The stronger the intermolecular forces, the lower the vapour pressure.

*Bestaan uit TWEE waterstofbindings plekke en het sterk intermolekulêre kragte tussen verbinding **A** en **B***

OR

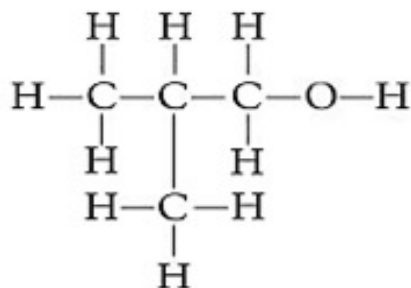
Hoe sterker die intermolekulêre kragte, hoe hoër die kookpunt. Hoe sterker die intermolekulêre kragte, hoe laer die dampdruk. (2)

- 3.7 Molecules that have the same molecular formula but different types of chains. ✓✓

Molekule met dieselfde molekulêre formule, maar verskillende struktuurformules (2)



3.8

**Marking criteria**

- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

Nasien kriteria

- ✓ Korrekte funksionele groep
- ✓ Hele struktuur korrek
- Indien 'n verbinding of waterstof kort ½

(2)

[14]**QUESTION/VRAAG 4**

4.1 4.1.1 Hydrohalogenation/Hidrohalogenering ✓ (1)

4.1.2 Hydration/Hidrasie ✓ (1)

4.2 Substitution reaction/Substitusie reaksie ✓ (1)

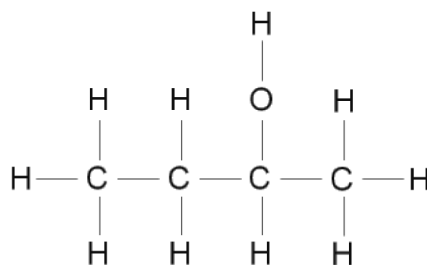
4.3 4.3.1 Butane/Butaan ✓ (1)

4.3.2 Bromobutane ✓ / 1-bromobutane
Bromobutaan / 1-bromobutaan (1)

4.3.3 Butan-2-ol ✓ (1)

4.4 4.4.1 Pt/ Pd/ Ni as a catalyst ✓
Pt/Pd/Ni as 'n katalisator (1)4.4.2 No water must be present ✓
Geen water moet teenwoordig wees nie (1)

4.5

**Marking criteria**

- ✓ Correct functional group
- ✓ Whole structure correct
- If a bond or hydrogen is missing ½

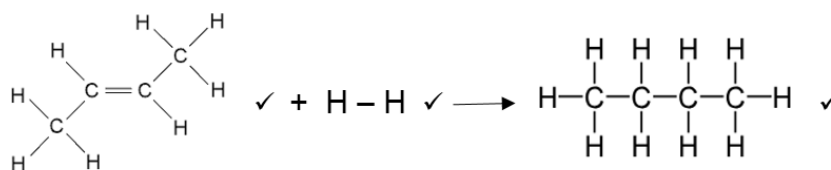
Nasien kriteria

- ✓ Korrekte funksionele groep
- ✓ Hele struktuur korrek
- Indien 'n verbinding of waterstof kort ½

(2)

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4.6 4.6.1

**Marking criteria/Nasien kriteria**

- 1 mark for the reactants/1 punt vir reaktante
- 1 mark for functional group of alkene/1 punt vir funksionele groep van alkeen
- 1 mark for Butane/1 punt vir Butaan
- **NOTE:** Penalise 1 mark if condensed structural/molecular formula for butene is given.
- **NOTA:** Penaliseer 1 punt indien gekondenseerde strukturele/molekulêre formule vir buteen gegee is.

(3)

4.7 4.7.1 Combustion / Oxidation ✓
Verbringing/ Oksidasie

(1)

4.7.2 $2\text{C}_3\text{H}_6 + 9\text{O}_2 \longrightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy}$ ✓ Balancing ✓

(3)

- 4.8
- Combustion of fuel source in applications where high heat is needed ✓
 - In engines of cars, bikes and automobiles
 - In generators to generate electricity
 - Powering industrial equipment
 - Blowtorches
 - Gas stoves

(Any one)

- Verbranding van brandstof in toerusting waar hoë hitte benodig word
- In motorenjins, motorfietse en motors
- In generators om elektrisiteit te genereer
- Aandryf van industriële toerusting
- "Blowtorches"
- Gasstowe

(Enige een)

(1)

[18]



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QUESTION/VRAAG 5

- 5.1 5.1.1 A material which has electrical conductivity between that of a conductor and an insulator. ✓ ✓
'n Materiaal met 'n elektriese geleidingsvermoë tussen dié van 'n geleier en 'n isolator (2)
- 5.1.2 Pure semiconductor. ✓ ✓
Suiwer halfgeleier (2)
- 5.2 The positive terminal of the battery must be connected to the p-type material ✓ and the negative terminal of the battery must be connected to the n-type material. ✓
Die positiewe terminaal van die battery moet gekoppel wees met die p-tipe materiaal en die negatiewe terminaal van die battery moet gekoppel wees met die n-tipe materiaal. (2)
- 5.3 Silicon (Si) ✓
 Germanium (Ge) ✓ (2)
- [8]**

TOTAL/TOTAAL: 75