Atomiese Kombinasies Memo
November 2018/1

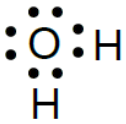
1.1 B ✓✓ (2)

1.2 C ✓✓ (2)

QUESTION 2/*VRAAG 2*

2.1 Chemical bond is mutual attraction between two atoms resulting from the simultaneous attraction between their nuclei and (outer) electrons. ✓✓
Chemiese binding is die wedersydse aantrekking tussen twee atome as gevolg van die gelyktydige aantrekking tussen hulle kerne en (buite)-elektrone. (2)

2.2.1  ✓✓
(2)

2.2.2  ✓✓
(2)

2.3 Linear ✓
Lineêr (1)

2.4 3 – 2,5 = 0,5 ✓ (1)

2.5 Polar ✓
Polêr (1)

2.6 CN has a higher order bond/triple bond with more orbitals overlapping ✓ than CH, which is a single bond. ✓ Thus CN bond needs more energy to break.
CN het 'n hoër orde/drievoudige binding met meer orbitale wat oorvleuel as die CN enkel binding. Dus benodig die CN-binding meer energie om te breek. (2)

2.7 CN has a longer bond length than CH ✓ because the H atom is smaller than the N atom. ✓
CN het 'n groter bindingslengte as CH omdat die H-atoom kleiner as die N-atoom is (2)

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2.8 Yes/*Ja* ✓ (1)

2.9

- HCN has polar molecules with dipole-dipole forces. ✓
- H_2O has polar molecules with hydrogen bonds (dipole-dipole forces). ✓
- If the forces are of the same order/comparable the substances will dissolve. ✓

OR

- Both molecules are polar ✓
- HCN has dipole-dipole forces and H_2O has (dipole-dipole forces) hydrogen bonds ✓
- Like dissolve like. ✓

- *HCN het polêre molekules met dipool-dipoolkragte.*
- *H_2O het polêre molekules met waterstofbindings.*
- *Indien die intermolekulêre kragte van dieselfde orde is, sal stowwe oplos*

OF

- *Beide molekules is polêr* ✓
- *HCN het dipool-dipool kragte en H_2O het (dipool-dipool kragte) waterstofbindings* ✓
- *Soort los op in soort* ✓ (3)

[17]

Atomiese Kombinasies Memo
November 2017

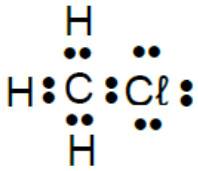
1.1 C ✓✓ (2)

1.3 C ✓✓ (2)

QUESTION/*VRAAG 2*

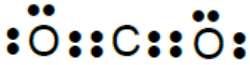
2.1 A covalent bond is the sharing of electrons between two atoms to form a molecule. ✓✓
'n Kovalente binding is die deel van elektrone tussen twee atome van 'n molekuul. ✓✓ (2)

2.2 2.2.1



✓✓ (2)

2.2.2



✓✓ (2)

2.3 None/zero ✓/*Geen/nul* ✓ (1)

2.4 H_2O/water ✓ (1)

2.5.1 H_2O is angular/bent/*hoekig* ✓ (1)

2.5.2 CO_2 is linear/*lineêr* ✓ (1)

2.6 (The charge distribution in) CH_3Cl is asymmetrical and CH_4 is symmetrical. ✓
(Die verspreiding van lading in) CH_3Cl is asimmetries en CH_4 is simmetries.

OR/*OF*

The chlorine has a higher electronegativity than the hydrogen. ✓
Die chloor het 'n hoër elektronegatiwiteit as waterstof. (1)
[11]

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November 2016

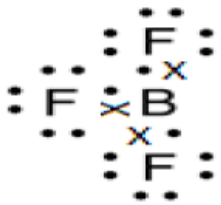
1.3 A ✓✓

QUESTION/*VRAAG 2*

2.1.1 Covalent bonding✓/*Kovalente binding* (1)

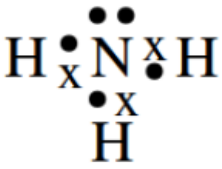
2.1.2 It is the sharing electrons between non-metals.✓
Die deling van elektrone tussen nie-metale. (1)

2.2.1



✓✓ (2)

2.2.2



✓✓ (2)

2.3 The bonds in both molecules are polar due to the difference in electronegativities ✓ between B and F and N and H.
The shape of the NH_3 molecule is pyramidal ✓ and therefore the molecule is polar ✓ because one side of the molecule can be positive and the other side negative.
The shape of the BF_3 molecule is trigonal planar✓ and thus its non-polar ✓ because the charge distibution is symmetrical.
Die bindings in beide molekules is polêr weens die verskil in die elektonegatiwiteite tussen B en F en N en H.
Die vorm van die NH_3-molekuul is piramidaal en dus is die molekuul polêr omdat een kant van die molekuul positief en die anderkant negatief kan wees.
Die vorm van die BF_3-molekuul is trigonaal planêr en dus is die molekuul nie-polêr omdat die ladingverspreiding simmetries is. (5)

2.4.1 Dative covalent bond✓/Co-ordinate bond
Datief kovalente binding/Koördinatiewe binding (1)

2.4.2 The oxygen in water molecule (H_2O) consists of two lone pairs of electrons ✓ that can make bonds with the empty valence s-orbital of H^+ ion. ✓
Die suurstof atoom in watermolekuul(H_2O) besit twee alleenpare elektrone wat bindings kan maak met die leë s-orbitaal van H^+-ioon. (2)
[14]

Atomiese Kombinasies
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QUESTION 2 / *VRAAG 2*

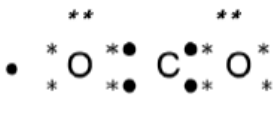
2.1 2.1.1 C √

2.1.2 E √

2.1.3 D √

2.2 A √ and/*en* D √

2.3.1



√√ (2)

2.3.2
- Electronegativity difference > 1 √√ / (C-2.1 and O-3.5 $\therefore \Delta EN = 1.4$)
  Verskil in elektronegatiwiteit > 1
- Uneven √ sharing of electron pairs √ / O-atoms have stronger pull on shared electron pairs.
  Onewe deel van elektronpare / O-atome trek gedeelde elektronpare sterker aan. (4)

[11]

1.2 C ✓✓ (2)

1.6 D ✓✓ (2)

QUESTION 2/*VRAAG 2*

2.1 The (average) distance between nuclei ✓
of two bonded atoms in a molecule. ✓
Die (gemiddelde) afstand tussen kerne van twee gebinde atome in 'n molekuul. (2)

2.2

2.2.1 60 (pm) ✓✓ (2)

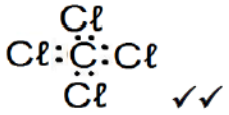
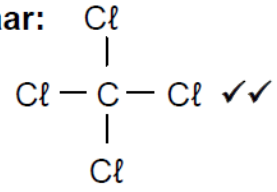
2.2.2 350 ($kJ \cdot mol^{-1}$) ✓✓ (2)

2.2.3 Bond energy ✓
Bindingsenergie (1)

2.3 Shorter than ✓
F atoms are smaller than Br atoms and come closer to H atom. ✓
Korter as
F-atome is kleiner as Br-atome en kom nader aan H-atoom. (2)
[9]

2.1 C ✓✓ (2)
2.2 A ✓✓ (2)
2.4 B ✓✓ (2)
2.5 B ✓✓ (2)
2.6 C ✓✓ (2)

VRAAG 3

3.1  ✓✓ **Aanvaar:**  (2)

3.2 **$CC\ell_4$:** tetrahedraal ✓ **CO_2:** lineêr ✓ (2)

3.3 Van der Waals/Londonkragte✓ (1)

3.4 CH_4 ✓ en CO_2 ✓ (2)

3.5 Beide C – H en C – O bindings is kovalent as gevolg van die elektronegatiwiteitsverskil ✓ maar die ladingsverspreiding op beide molekule as geheel is simmetries ✓ en dus is die molekule nie-polêr. (2)

3.6 C ✓ (1)

3.7 NH_3 ✓ (1)
[11]