higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

CHEMIE N4

24 JULIE 2018

Hierdie nasienriglyn bestaan uit 5 bladsye.

Kopiereg voorbehou

VRAAG 1

1.1 1.1.1 Dit het:
- directional properties
- molecules that are easily separated
- molecules are small with weak Van der Waal's forces
- molecules with a definite overall shape (4)

1.1.2
- generally electrolyte
- conduct electricity if dissolved in polar solvent (2)

1.1.3
- soluble in non – polar solvent
- chemical reaction of polar and covalent causes the structure to become ionised (2)

1.2 H_2, Cl_2, HCl, H_2O, HOCl en NH_3 (Enige 2 × 1) (2)

1.3
- The ionisasie-energie of een atom is relatively low
- The electron affinity of the other atom is high
- The lattice energy is high (3)

1.4 1.4.1 metallic bonding

1.4.2 dative covalent bonding/co-ordinate covalent bonding

1.4.3 ionic bonding

1.4.4 electrovalent bonding

1.4.5 ionic/hydrogen bonding

(5 × 1) (5)

1.5 The arrangement in space✓ of the covalent bond in multiple covalent✓ which is related to the number of electrons in their valency shell.✓ (3)

1.6 Sublimasie energie : $Na_{(s)} \rightarrow Na_{(g)}$✓✓

Eerste ionisasie-energie: $Na_{(g)} \rightarrow Na^+_{(g)} + e$✓✓ (4)

[25]

VRAAG 2

2.1 2.1.1 AX_5 (2)

2.1.2 chlorine triflouride (2)

2.1.3  (4)

2.1.4 trigonal pyramid (1)

2.1.5 five (1)

2.1.6 No,✓ because sulphur is surrounded by 10 valence electrons.✓ (2)

2.1.7 10 valence electrons (1)

2.2 2.2.1 chlorine ion (1)

2.2.2 covalent hydride (1)

2.2.3 Because it releases hydrogen ions in water. (2)

2.2.4 $K_a = \frac{[H_3O^+][Cl^-]}{[HCl]}$ ✓✓✓ (3)

2.2.5 Big, HCl is a strong acid. (2)

2.2.6
- H_2O en H_3O^+✓
- HCl en Cl^-✓ (2)

2.2.7 HCl (1)

[25]

VRAAG 3

3.1 $2H_2O_2$ ✓ → $2H_2O$✓ + O_2✓ (3)

3.2
- It is a colourless and diatomic gas
- It liquefies at – 183 °C and -219 °C
- It important in normal respiration and combustion process
- Dit reageer met alle ander elemente behalwe edelgasse (Enige 2 × 1) (2)

3.3 When a slow dry stream of oxygen is passed through a silent electrical discharge. (2)

3.4 3.4.1
- swaeltrioksied
- distikstofpentoksied
- koolsuurgas
- silikondioksied (Enige EEN)

3.4.2
- distikstof(mon)oksied
- stikstofoksied (Enige EEN)

3.4.3
- aluminiumoksied
- sinkoksied
- water (Enige EEN)

3.4.4
- kaliummonoksied
- natriummonosied
- kalsiumoksied (Enige EEN)

(4 × 1) (4)

3.5 $Ca(OH)_2$✓ + $2NH_4Cl$ ✓ ⟶ $CaCl_2$✓ + $2H_2O$✓ + $2NH_3$✓ (5)

3.6
- kleurlose gas
- reuklose diatomiese gas (2)

3.7
- Byvoeging van wassoda (natriumkarbonaat)
- Die ioon-uitruilproses
- Die calgon-proses (3)

3.8 N_2✓ + $3H_2$✓ → $2NH_3$✓
Haber-proses✓ (4)
[25]

VRAAG 4

4.1 CS_2✓ + $3Cl_3$✓ → CCl_4✓ + S_2Cl_2✓ (4)

4.2
- protium
- deuterium
- tritium (3)

4.3 C✓ + $2F_2$✓ → CF_4✓
product : carbon tetraflouride✓ (4)

4.4
4.4.1 ionic carbide
4.4.2 intrestitional carbide
4.4.3 interstitional hydride
4.4.4 covalent carbide
(4 × 1) (4)

4.5
- berrylium hydride
- magnesium hydride (2)

4.6
4.6.1 deuterium oxide
4.6.2 ethanol
4.6.3 carbon monoxide
(3 × 1) (3)

4.7 4.7.1 C + $2H_2SO_4$ → $2H_2O$✓ + $2SO_2$✓ + CO_2✓ (3)

4.7.2 NiO + CO → Ni✓ + CO_2✓ (2)
[25]

TOTAL: 100

Kopiereg voorbehou