higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N4

26 July 2021

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
1.1.1 True
1.1.2 False
1.1.3 True
1.1.4 False
1.1.5 True
1.1.6 False
1.1.7 False
1.1.8 True
1.1.9 False
1.1.10 True

(10 × 1) (10)

1.2
- BF_3
- BCl_3
- C_2H_2
- NO_3^-
- SO_2

(5)

1.3
1.3.1 CH_3COOH
1.3.2 CaH_2
1.3.3 ZnO
1.3.4 $BaSO_4$
1.3.5 Fe_2O_3

(5 × 1) (5)

1.4 Sublimation energy is the energy needed to break down the metallic lattice of sodium.

OR

Sublimation energy is the energy required to convert one mole of sodium into a gaseous atom.

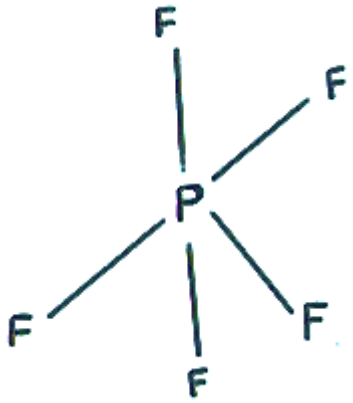
$Na_{(s)} \rightarrow Na_{(g)}$

Energy is endothermic. (5)
[25]

QUESTION 2

2.1 2.1.1 Phosphorus pentafluoride (2)

2.1.2



(3)

2.1.3 None (1)

2.1.4 No. It contains 10 electrons (2)

2.2 2.2.1 D
2.2.2 E
2.2.3 A
2.2.4 B
2.2.5 C

(5 × 1) (5)

2.3 2.3.1 $CO_{3(aq)}^{2-} + H_2O_{(l)} \leftrightarrow HCO_{3(aq)}^{-} + OH_{(aq)}^{-}$ (2)

2.3.2 Weak base. (1)

2.3.3 $K_a = \frac{[HCO_3^-][OH^-]}{[CO_3^-]}$ (3)

2.3.4
- CO_3^- and HCO_3^- ✓
- H_2O and OH^- ✓ (2)

2.4 CO✓ + H_2O✓ → CO_2 ✓ + H_2✓ (4)

[25]

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QUESTION 3

3.1 3.1.1 A = Cl2✓ and B = CS2✓ or vice versa

3.1.2 Carbon tetrachloride

3.1.3
- As a solvent
- In fire extinguishers

(3 × 2) (6)

3.2 3.2.1 Interstitial
3.2.2 Covalent
3.2.3 Ionic

(3 × 1) (3)

3.3 SiO_2✓+ 3C✓ → SiC✓ + 2CO✓

SiC → Si + C✓ (5)

3.4
- Hydrogen: 1
- Deuterium: 2
- Tritium: 3

(6)

3.5
- Liquefiable gas with characteristic smell.
- Readily dissolve in water.
- Turns red litmus blue.

(3)

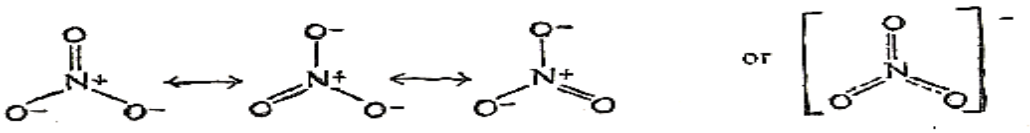
3.6 3.6.1 Peroxide
3.6.2 Normal oxide

(2 × 1) (2)
[25]

QUESTION 3

4.1
- Bleaching agent
- Oxidising agent
- In pure drinking water
- Production of pharmaceuticals (4)

4.2



1 mark for each diagram (4)

4.3 Amphoteric is a substance that act as an acid and also as a base.✓✓
Example : Water/H_2O✓ (3)

4.4
- Electrolyte
- Good conductor of electricity in molten form or fused
- Low melting and boiling point
- Generally soluble in nonpolar solvent
- Has directional properties (5 x 1) (5)

4.5 4.5.1 $2Fe_2S_3 + 3O_2 \rightarrow 2Fe_2O_3$✓ + 6S✓ (2)

4.5.2 $5CO + I_2O_5 \rightarrow 5CO_2$✓ + I_2✓ (2)

4.5.3 $C + 4HNO_3 \rightarrow 2H_2O$✓ + $4NO_2$✓ + CO_2✓ (3)

4.6
- Calcium sulphate
- Magnesium sulphate (2)

[25]

TOTAL: 100

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