higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N5

19 April 2021

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 C (1)

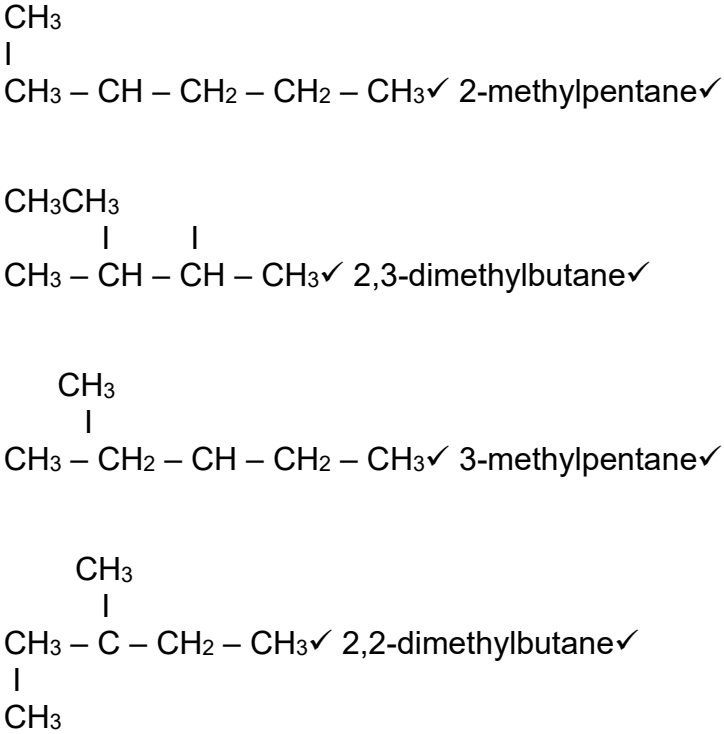
1.2 D (1)

1.3 Ketones (1)

1.4 C_nH_{2n+2} (1)

1.5 A: 1-propene
B: Phenol
F: Propanone (3 × 2) (6)

1.6



(Any 3 × 2) (6)

1.7 $C_4H_6 + {}^{11}/_2O_2\,(g) \rightarrow 4CO_2\,(g) + 3H_2O\,(\ell)$ (4)

1.8 Addition reaction. (1)

1.9 C1: Sp^3
C2: Sp (2)

1.10
- Compound B:✓ Alcohols are soluble in water, but the extent of its solubility is limited.✓
- Compound F:✓ Acetone is soluble in water.✓ (Any 2 × 1) (2)

[25]

QUESTION 2

2.1 2.1.1 C_7H_{14} (1)

2.1.2 C_nH_{2n} (1)

2.1.3 It is nonpolar.✓ Alkenes are nonpolar compounds.✓ (2)

2.1.4 Markovnikov's rule states that during the addition of HX to an alkene, the H attaches itself to the carbon atom with fewer alkyl substituents and the X will attach itself to a carbon atom with more alkyl substituents. (2)

2.1.5

$$CH_3(CH_2)_2C(CH_3)=CHCH_3 + HC\ell \rightarrow CH_3(CH_2)_2C(C\ell)CH_2CH_3 \checkmark\checkmark +$$

Major product

$$CH_3(CH_2)_2CH(CH_3)CH(C\ell)CH_3 \checkmark\checkmark$$

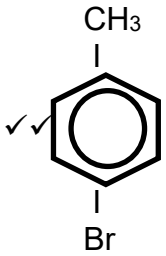
Minor product (4)

2.1.6
- 3-chloro-3-methylhexane
- 2-chloro-3-methylhexane (2 × 2) (4)

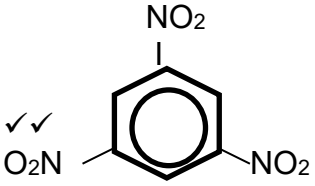
2.1.7
- Ketone or 2-pentanone
- Aldehyde/Ethanal (2 × 2) (4)

2.2 $HC \equiv CCH_3$✓ (3)

2.3 2.3.1



2.3.2

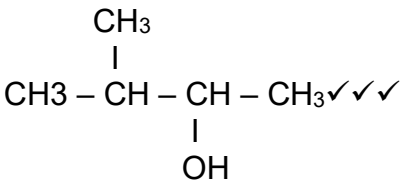


(2 × 2) (4)

[25]

QUESTION 3

3.1 3.1.1



(3)

3.1.2 Secondary alcohol✓ The -OH functional group is bonded to a carbon atom with one hydrogen atom.✓ (2)

3.1.3 Water (1)

3.1.4 3-methyl-2-butanol (2)

3.1.5 Dehydration reaction (1)

3.1.6 RCOR (1)

3.1.7 Ethanal (2)

3.1.8
- Alcohols containing up to 12 carbon atoms are liquid.
- The boiling point of alcohols increases with an increase in molecular mass.
- The high boiling points of alcohols result from hydrogen bonding.
- Methanol, ethanol and propanol are soluble in water at ordinary temperature and pressure.
- Solubility in water decreases with an increase in molecular mass. (5)

3.2 $CH_3CH_2OH\ (aq) + O_2\ (g) \rightarrow CH_3COOH\ (aq) + H_2O\ (\ell)$ (4)

3.3 3.3.1 Cyclopropanone
3.3.2 Methanal
(2 × 2) (4)

[25]

QUESTION 4

4.1 4.1.1 Ethanoic acid (2)

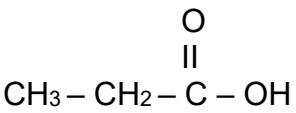
4.1.2 $CH_3(CH_2)_6CH_2OH$ (3)

4.1.3 Ester (1)

4.1.4 $CH_3(CH_2)_6CH_2OH + CH_3COOH \rightarrow CH_3COOCH_2(CH_2)_6CH_3 + H_2O$ (4)

4.1.5 RCOOR (1)

4.2 4.2.1



4.2.2 $CH_3 – CH_2 – O – CH_3$

4.2.3 $(CH_3)_3N$

(3 × 2) (6)

4.3 $CH_3COOH\ (aq) + H_2O\ (\ell) \rightarrow CH_3COO^-\ (aq) + H_3O^+\ (aq)$ (4)

4.4 4.4.1 Formalin
4.4.2 Aniline
4.4.3 Vinegar
4.4.4 Urea

(4 × 1) (4)
[25]

TOTAL: 100

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