higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

CHEMISTRY N5

01 September 2021

This marking guideline consists of 4 pages.

QUESTION 1

1.1 False
1.2 True
1.3 True
1.4 False
1.5 False

(5 × 1) **[5]**

QUESTION 2

2.1 2.1.1 B: 4-Ethyl-3-methylheptane
C: 3-Ethyl-4,7-dimethylnonane (3 × 2) (6)

2.1.2 $CH_3CH_2CH_2CH_2CH_2CH_2CH_3$ (2)

2.1.3 None (1)

2.1.4 C_9H_{20} (2)

2.1.5 C_nH_{2n+2} (1)

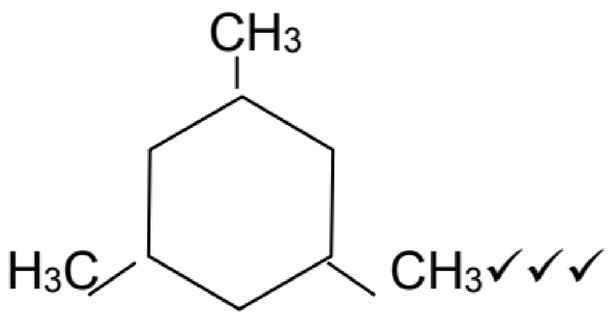
2.1.6 None.✓ Alkanes are insoluble in water.✓ (2)

2.1.7 $C_{10}H_{22} + 33/2O_2(g) \rightarrow 10CO_2(g) + 11H_2O(\ell)$ (4)

2.1.8
- Alkanes are classified as saturated hydrocarbons.
- Their boiling points increase with an increase in molecular weight.
- Alkanes up to butane exist as gases at ordinary temperature and pressure.
- Alkanes from n = 5 up to n = 16 are liquids at ordinary temperatures and pressures, and those with more than 16 carbon atoms are waxy solids.
- Alkanes are non-polar and does not dissolve in water.

(Any 4 × 1) (4)

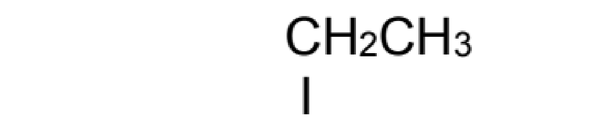
2.2



(3)
[25]

QUESTION 3

3.1 3.1.1



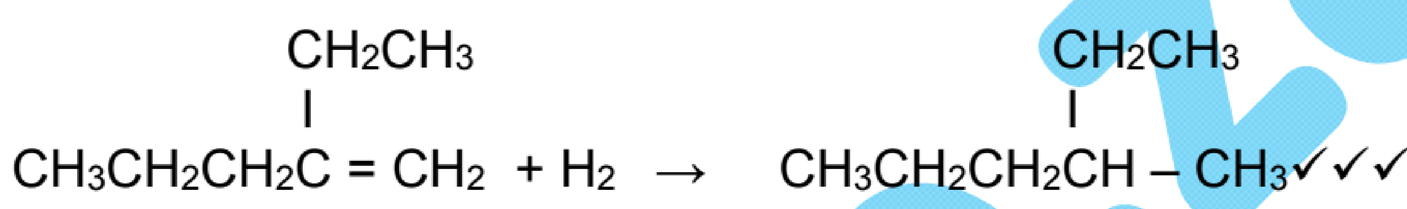
$CH_3CH_2CH_2C = CH_2$ ✓✓✓ (3)

3.1.2 C_6H_{12} (1)

3.1.3 C_nH_{2n} (1)

3.1.4 Methanal
3-Hexanone (2 × 2) (4)

3.1.5



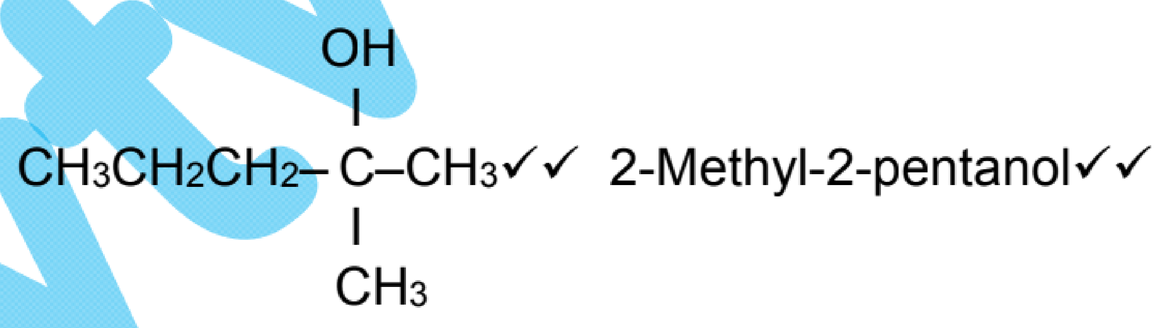
$CH_3CH_2CH_2C = CH_2 + H_2 \rightarrow CH_3CH_2CH_2CH - CH_3$ ✓✓✓ (3)

3.2 A Lindlar catalyst is a finely divided palladium metal✓ precipitated onto a calcium carbonate support✓ and then deactivated by treatment with lead acetate✓ and quinoline and aromatic amine.✓ (4)

3.3 3.3.1 $CH_2 = CHCH = CH_2$
3.3.2 $CH_3CH_2C \equiv CCH_2CH_3$
(2 × 2) (4)
[20]

QUESTION 4

4.1 4.1.1



$CH_3CH_2CH_2-C(OH)(CH_3)-CH_3$ ✓✓ 2-Methyl-2-pentanol✓✓ (4)

4.1.2 Tertiary alcohol (1)

4.1.3 Grignard reagent (1)

4.1.4 $CH_3Br + Mg \rightarrow CH_3MgBr$ (3)

4.1.5
- Alcohols containing up to 12 carbon atoms are liquid at ordinary temperature and pressure.
- The boiling point of alcohols increases with an increase in molecular mass.
- The high boiling points of alcohols results 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.

(Any 3 × 1) (3)

