

Answer to Some Selected Problems

UNIT 7

7.25 15 g

UNIT 8

8.32 Mass of carbon dioxide formed = 0.505 g

Mass of water formed = 0.0864 g

8.33 % of nitrogen = 56

8.34 % of chlorine = 37.57

8.35 % of sulphur = 19.66

UNIT 9

9.1 Due to the side reaction in termination step by the combination of two $\dot{\text{C}}\text{H}_3$ free radicals.

- 9.2 (a) 2-Methyl-but-2-ene (b) Pent-1-ene-3-yne
(c) Buta-1, 3-diene (d) 4-Phenylbut-1-ene
(e) 2-Methylphenol (f) 5-(2-Methylpropyl)-decane
(g) 4-Ethyldeca -1,5,8- triene

- 9.3 (a) (i) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_3$ But-1-ene
(ii) $\text{CH}_3 - \text{CH}_2 = \text{CH} - \text{CH}_3$ But-2-ene
(iii) $\text{CH}_2 = \underset{\text{CH}_3}{\text{C}} - \text{CH}_3$ 2-Methylpropene

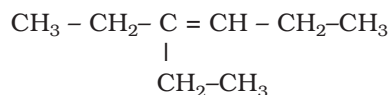
- (b) (i) $\text{HC} \equiv \text{C} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ Pent-1-yne
(ii) $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_2 - \text{CH}_3$ Pent-2-yne
(iii) $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \text{C} \equiv \text{CH}$ 3-Methylbut-1-yne

- 9.4 (i) Ethanal and propanal (ii) Butan-2-one and pentan-2-one
(iii) Methanal and pentan-3-one (iv) Propanal and benzaldehyde

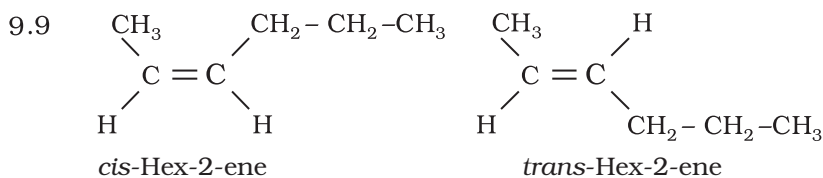
9.5 3-Ethylpent-2-ene

9.6 But-2-ene

9.7 4-Ethylhex-3-ene

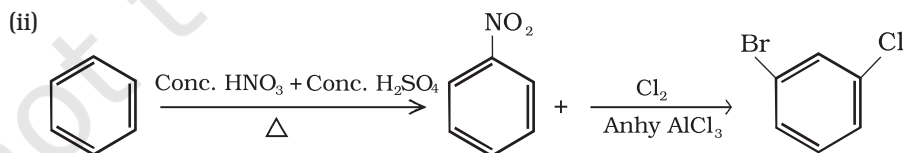
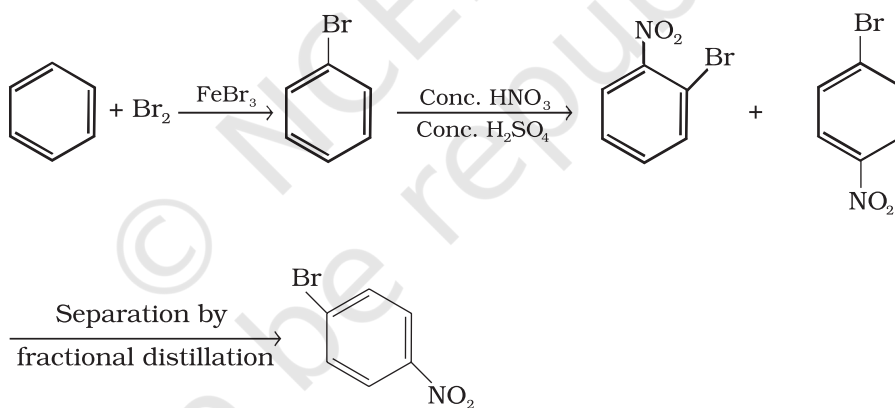





- 9.8 (a) $C_4H_{10}(g) + 13/2 O_2(g) \xrightarrow{\Delta} 4CO_2(g) + 5H_2O(g)$
 (b) $C_5H_{10}(g) + 15/2 O_2(g) \xrightarrow{\Delta} 5CO_2(g) + 5H_2O(g)$
 (c) $C_5H_{10}(g) + 17/2 O_2(g) \xrightarrow{\Delta} 6CO_2(g) + 5H_2O(g)$
 (d) $C_7H_8(g) + 9 O_2(g) \xrightarrow{\Delta} 7CO_2(g) + 4H_2O(g)$



The *cis* form will have higher boiling point due to more polar nature leading to stronger intermolecular dipole-dipole interaction, thus requiring more heat energy to separate them.

- 9.10 Due to resonance
 9.11 Planar, conjugated ring system with delocalisation of $(4n+2)$ electrons, where, n is an integer
 9.12 Lack of delocalisation of $(4n+2)$ π electrons in the cyclic system.
 9.13 (i)



- 9.20 (i) $3 \text{CH} \equiv \text{CH} \xrightarrow[873\text{K}]{\text{Red hot Iron tube}}$ 
- (ii) $\text{C}_2\text{H}_4 \xrightarrow{\text{Br}_2} \begin{array}{c} \text{CH}_2 - \text{CH}_2 \\ | \quad | \\ \text{Br} \quad \text{BR} \end{array} \xrightarrow{\text{alc. KOH}} \text{CH}_2 = \text{CHN}r \xrightarrow{\text{NaNH}_2} \text{HC} \equiv \text{HC} \xrightarrow[873\text{K}]{\text{Red hot Iron tube}}$ 
- (iii) $\text{C}_6\text{H}_{14} \xrightarrow[773\text{K, 10-20 atom}]{\text{Cr}_2\text{O}_3 / \text{V}_2\text{O}_5 / \text{Mo}_2\text{O}_3}$ 
- 9.21 $\text{CH}_2 = \text{C}(\text{CH}_3) - \text{CH}_2 - \text{CH}_3$ 2-Methylbut-1-ene
- $\text{CH}_3 - \text{C}(\text{CH}_3) = \text{CH} - \text{CH}_3$ 2-Methylbut-2-ene
- $\text{CH}_3 - \text{CH}(\text{CH}_3) - \text{CH} = \text{CH}_2$ 3-Methylbut-1-ene
- 9.22 (a) Chlorobenzene > *p*-nitrochlorobenzene > 2,4-dinitrochlorobenzene
 (b) Toluene > *p*-CH₃-C₆H₄-NO₂ > *p*-O₂N-C₆H₄-NO₂
- 9.23 Toluene undergoes nitration most easily due to electron releasing nature of the methyl group.
- 9.24 FeCl₃
- 9.25 Due to the formation of side products. For example, by starting with 1-bromopropane and 1-bromobutane, hexane and octane are the side products besides heptane.

NOTES

© NCERT
not to be republished