

Answer to Some Selected Problems

UNIT 8

8.25 15 g

UNIT 12

12.32 Mass of carbon dioxide formed = 0.505 g

Mass of water formed = 0.0864 g

12.33 % of nitrogen = 56

12.34 % of chlorine = 37.57

12.35 % of sulphur = 19.66

UNIT 13

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

13.2 (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

13.3 (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) $\text{CH}_2 = \text{C} - \text{CH}_3$

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) $\text{CH}_3 - \text{CH} - \text{C} \equiv \text{CH}$

3-Methylbut-1-yne



13.4 (i) Ethanal and propanal

(ii) Butan-2-one and pentan-2-one

(iii) Methanal and pentan-3-one

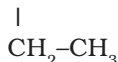
(iv) Propanal and benzaldehyde

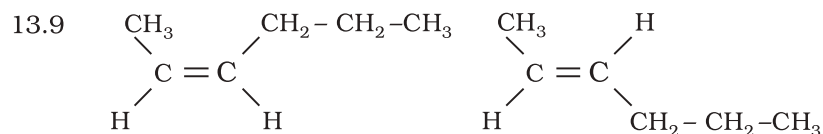
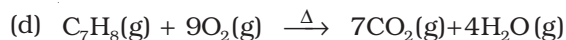
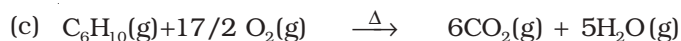
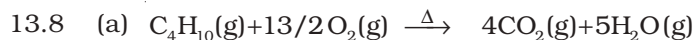
13.5 3-Ethylpent-2-ene

13.6 But-2-ene

13.7 4-Ethylhex-3-ene

$\text{CH}_3 - \text{CH}_2 - \text{C} = \text{CH} - \text{CH}_2 - \text{CH}_3$





cis-Hex-2-ene

trans-Hex-2-ene

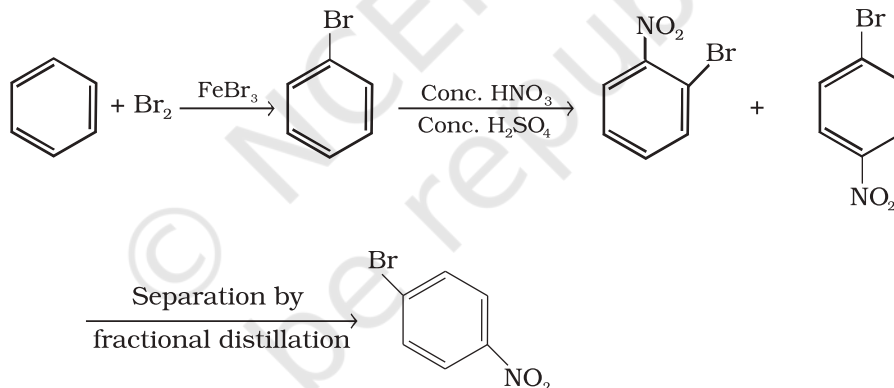
The *cis* form will have higher boiling point due to more polar nature leading to stronger intermolecular dipole-dipole interaction, thus requiring more heat energy to separate them.

13.10 Due to resonance

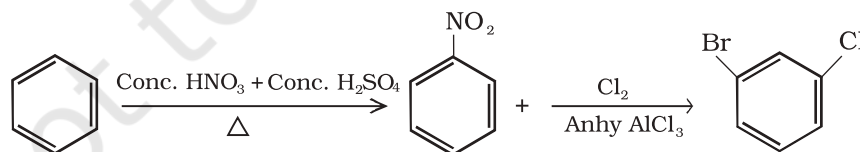
13.11 Planar, conjugated ring system with delocalisation of $(4n+2)$ π electrons, where, n is an integer

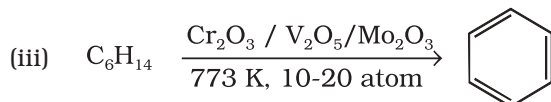
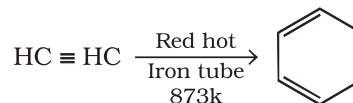
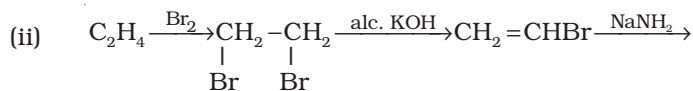
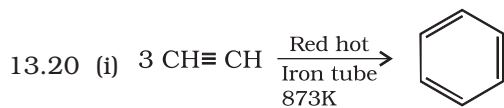
13.12 Lack of delocalisation of $(4n+2)$ π electrons in the cyclic system.

13.13 (i)



(ii)





13.22 (a) Chlorobenzene > *p*-nitrochlorobenzene > 2,4 - dinitrochlorobenzene

(b) Toluene > *p*-CH₃-C₆H₄-NO₂ > *p*-O₂N-C₆H₄-NO₂

13.23 Toluene undergoes nitration most easily due to electron releasing nature of the methyl group.

13.24 FeCl₃

13.25 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.