

ANSWERS

I. Multiple Choice Questions (Type-I)

1. (ii) 2. (iv) 3. (i) 4. (ii) 5. (i) 6. (i)
7. (i)
8. (iii), boiling point of (a) 364 K, boiling point of (b) 375 K, boiling point of (c) 346 K
9. (ii)
10. (i), **Hint** : Make the models of all the molecules and superimpose (i) to (iv) molecules on molecule (A).
11. (ii) 12. (i) 13. (ii) 14. (ii) 15. (iii) 16. (ii)
17. (iv) 18. (iii) 19. (ii) 20. (iv) 21. (iii) 22. (i)
23. (i), **Hint** : $\text{C}_6\text{H}_5\overset{\oplus}{\text{C}}\text{H}_2$ is stable cation so favours the progress of reaction by $\text{S}_{\text{N}}1$ mechanism.
24. (ii) 25. (i) 26. (iii) 27. (iv) 28. (iv) 29. (iii)
30. (i) 31. (iv)

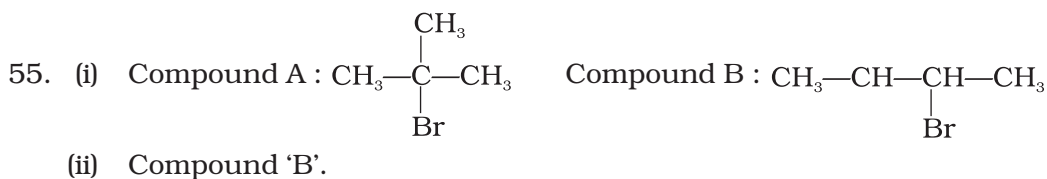
II. Multiple Choice Questions (Type-II)

32. (i), (iii) 33. (i), (ii) 34. (i), (iv) 35. (i), (iv)
36. (i), (iii) 37. (i), (iv) 38. (i), (iii) 39. (i), (iii)
40. (i), (iii) 41. (i), (iv) 42. (i), (ii) 43. (ii), (iii)

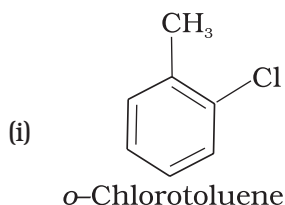
III. Short Answer Type

44. Iodination reactions are reversible in nature. To carry out the reaction in the forward direction, HI formed during iodination is removed by oxidation. HIO_4 is used as an oxidising agent.
45. *p*-Dibromobenzene has higher melting point than its *o*-isomer. It is due to symmetry of *p*-isomer which fits in crystal lattice better than the *o*-isomer.
46. $\text{C}_6\text{H}_5\text{—CH}_2\text{—Cl}$
47. Due to liberation of free iodine.
48. See NCERT textbook for Class XII.
49. See NCERT textbook for Class XII.
50. (b), C—O bond is more stable in (b) because of resonance.

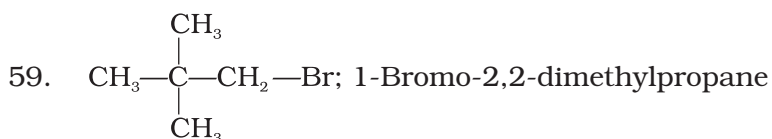
51. 'B' is major product of the reaction. For explanation, see Markownikov's rule. Consult chemistry textbook, Class XI, NCERT, Section 13.3.5.
52. See NCERT textbook for Class XII.
53. Ortho-para directing due to increase in the electron density at ortho and para positions. (For resonance structures consult NCERT textbook, Class XII)
54. (i) Primary (ii) Secondary (iii) Tertiary



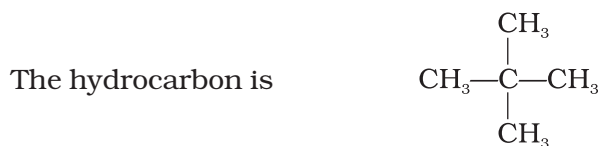
56.

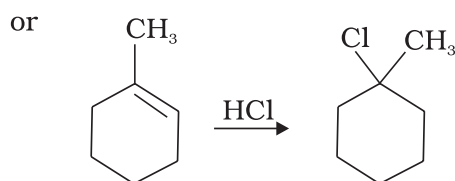
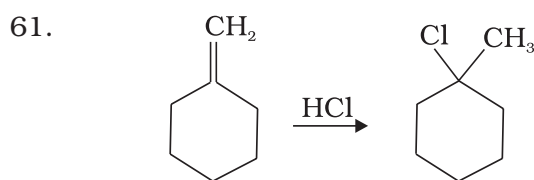
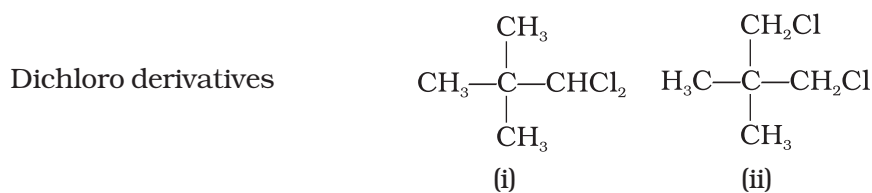


58. II, due to symmetry of para-positions; it fits into crystal lattice better than other isomers.

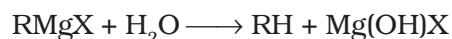


60. C_5H_{12} , pentane has molecular mass 72 g mol^{-1} , i.e. the isomer of pentane which yields single monochloro derivative should have all the 12 hydrogens equivalent.

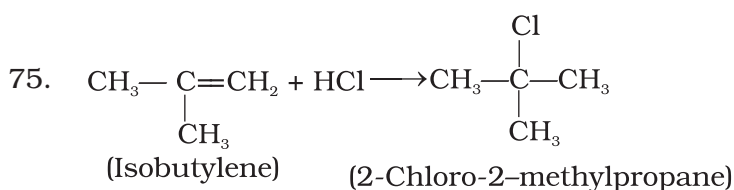




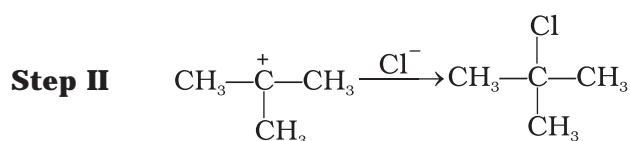
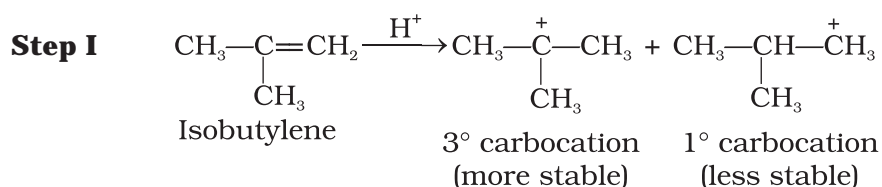
62. (iii); The tertiary carbocation formed in the reaction is stable.
63. C—O bond in phenols is more stable due to resonance effect and it has double bond character, hence breaking of this bond is difficult.
64. (B) Undergoes S_N1 reaction faster than (A) because in case of (B), the carbocation formed after the loss of Cl⁻ is stabilised by resonance, whereas, no such stabilisation is possible in the carbocation obtained from (A).
65. Allyl chloride shows high reactivity as the carbocation formed by hydrolysis is stabilised by resonance while no such stabilisation of carbocation exists in the case of *n*-propyl chloride.
66. Grignard reagents are highly reactive and react with water to give corresponding hydrocarbons.



67. **[Hint:** solvation of carbocation.]
68. **[Hint :** (1) Unsaturation test with Br₂ water (2) Bayer's test.]
69. Consult NCERT textbook for Class XII.
70. Consult NCERT textbook for Class XII.
71. Consult NCERT textbook for Class XII.
72. Consult NCERT textbook for Class XII.
73. III > II > I
74. Consult Chemistry textbook (NCERT) Class XII, Part II.



The mechanism involved in this reaction is:



76. **Hint :** Discuss polar nature and stabilisation of C—X bond.
77. **Hint :** $\text{C}_2\text{H}_5\text{OH} + \text{HCl} \xrightarrow{\text{ZnCl}_2} \text{C}_2\text{H}_5\text{Cl} \xrightarrow{\text{NaI}} \text{C}_2\text{H}_5\text{I}$.
78. **Hint :** It acts as a stronger nucleophile from the carbon end because it will lead to the formation of C—C bond which is more stable than the C—N bond.

IV. Matching Type

79. (i) → (c) (ii) → (d) (iii) → (a) (iv) → (b)
80. (i) → (c) (ii) → (e) (iii) → (a) (iv) → (b) (v) → (d)
81. (i) → (b) (ii) → (d) (iii) → (a) (iv) → (c)
82. (i) → (b) (ii) → (d) (iii) → (e) (iv) → (a) (v) → (c)
83. (i) → (a) (ii) → (c) (iii) → (b) (iv) → (d)
84. (i) → (b) (ii) → (a) (iii) → (d) (iv) → (c)

V. Assertion and Reason Type

85. (ii) 86. (v) 87. (iv) 88. (i) 89. (i) 90. (v)
91. (iii) 92. (i) 93. (iii) 94. (iv)

VI. Long Answer Type

95. **Hint :** Primary alkyl halides prefer to undergo substitution reaction by $\text{S}_{\text{N}}2$ mechanism whereas tertiary halides undergo elimination reaction due to the formation of stable carbocation.
96. Consult Chemistry textbook of NCERT for Class XII.
97. Consult Chemistry textbook of NCERT for Class XII.