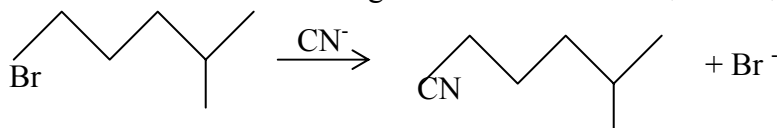# Review Problems: R-X

1. Predict whether the following mechanism will be S_N1 or S_N2, state your reasons.

2. S_N1 reactions show 1st order kinetics. Explain what this statement means_____.

3. What choices for X and Y would **most** favour the following reaction:

$$R_3C\text{-}X \xrightarrow{\quad X^- \quad} R_3C^+ \xrightarrow{\quad Y^- \quad} R_3C\text{-}Y$$

4. The treatment of D-2-bromobutane with NaOH results in the production of a compound with L-configuration. The reaction has most likely taken place through which mechanism: S_N1 or S_N2. Justify your answer.

5. Would the following reactants use S_N1 or S_N2 as their mechanism in a reaction?
   $$(CH_3)_3CX + NaOH_{(aq)} \rightarrow$$
Justify your answer, and complete the mechanism for the reaction, giving the name of the product.

6. What are the conditions required for turning $CH_3X \rightarrow CH_3OH$, and would the reaction occur via the mechanism S_N1 or S_N2?

   _____

7. State the anion and, if necessary, medium required for converting the following reactants to the following products:
   a) $C_2H_5Br \rightarrow C_2H_5OC_2H_5$
   b) $C_2H_5CN \rightarrow C_2H_5COOH$
   c) $C_2H_5Br \rightarrow C_2H_6$
   d) $C_2H_5Br \rightarrow C_2H_5NH_2$

8. What are the mechanisms, rate determining steps, and products of the following reactions?

a)

b)
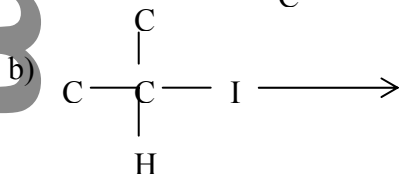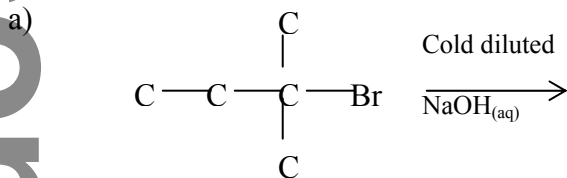
9. Why is a nucleophilic attack on — Br not possible?

Answers

1) 1° $\therefore$ S_N2

2) $\therefore$ slow step indicates only 1 molecule

3) X = I⁻, Y = CN⁻

4) S_N2

5) 3° $\therefore$ S_N1

6) dilute, cold, aq OH⁻ , non-polar solvent

7) a) ⁻OC_2H_5 in a alcoholic solvent

b) CN⁻ in dilute aqueous acidic, H⁺/ H_2O, medium.

c) Reduction using $LiAlH_4$

d) ammonia in alcoholic medium

8) (a) S_N1, 2,2 dimethyl propanol,

(b) via either S_N1 or S_N2 since it is secondary , product: propan-2-ol

9) since lone pair on the halogen also participates in the delocalization of the benzene, thus C- X bond is stronger, also electron density on the carbon is increase, therefore, the electrophilic carbon is less likely to be attacked by the nucleophilic.