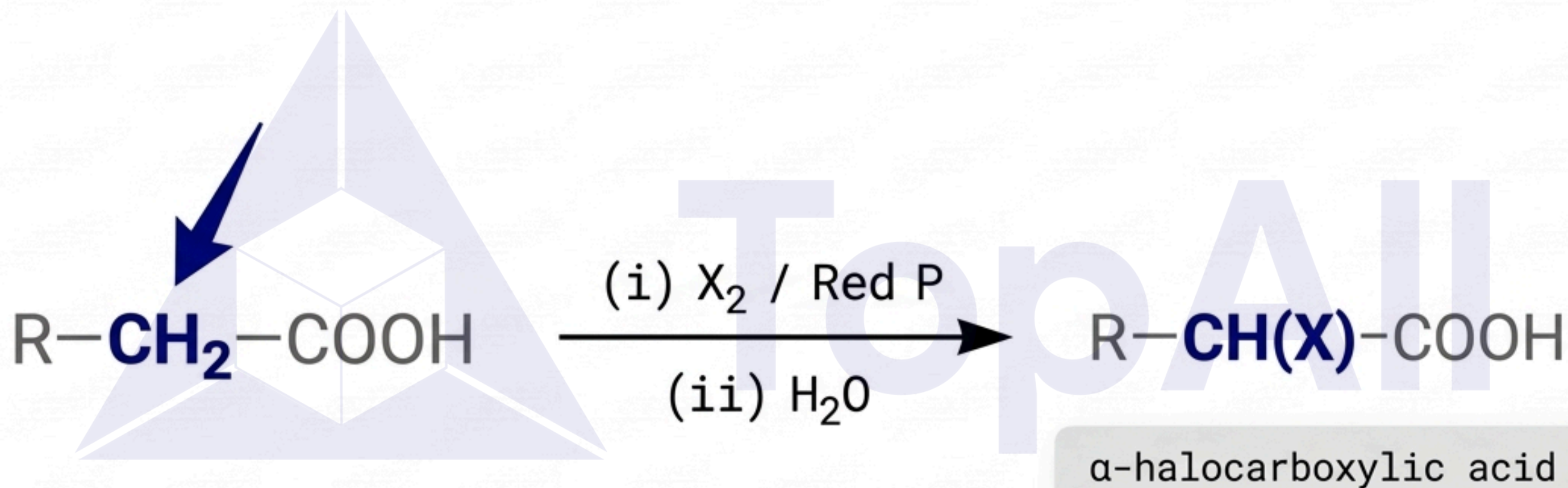


UNIT 8 • ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Halogenation of Carboxylic Acids (Hell-Volhard-Zelinsky Reaction)

Halogen substitutes at the α -carbon only





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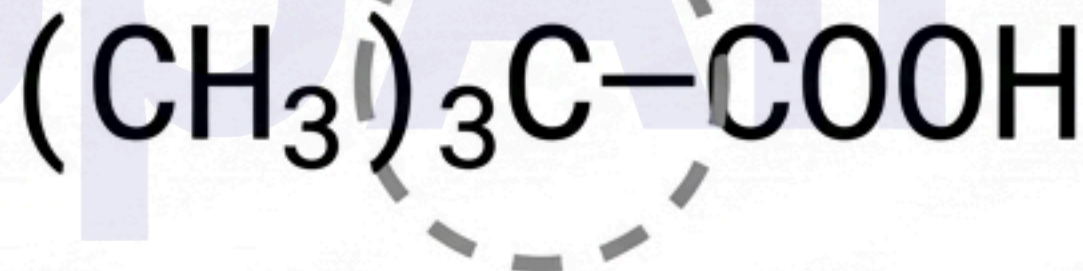


Substrate-Eligibility Check

Rule: α -hydrogen present $\rightarrow$ reaction proceeds; absent $\rightarrow$ no reaction.



Reaction Proceeds



No Reaction

Watch for this: Always check for the α -hydrogen first.



Benzoic acid

Carbon is part of the aromatic ring—zero α -hydrogens.



Trichloroacetic acid

α -carbon is fully substituted with halogens—zero α -hydrogens.

Just possessing a $-\text{COOH}$ group is not enough.
Without an α -H, the HVZ reaction will NOT occur.

Which of the following carboxylic acids will NOT undergo the Hell-Volhard-Zelinsky (HVZ) reaction?

A. Ethanoic acid

B. Propanoic acid

C. 2-Methylpropanoic acid

D. 2,2-Dimethylpropanoic acid



Correct! The α -carbon is attached to three methyl groups, leaving zero α -hydrogens.

Summary & Key Rules

- The HVZ reaction strictly requires an α -hydrogen; halogen substitution occurs **ONLY** at this specific α -position.
- **Reagents:** X_2 (Cl or Br) with a Red Phosphorus catalyst, followed by hydrolysis (H_2O), yields an α -halocarboxylic acid.





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