# Chem Factsheet

April 2003 Number 52


# Reactions of Functional Groups - A Summary

**To succeed in this topic you need to:**

- **Be able to recall and write out the functional groups represented in this Factsheet;**
- **Have a thorough knowledge of the organic reactions and their conditions (described in the Organic Chemistry Factsheets to date 27, 31, 32, 33, 34 and 39);**
- **Recognise the summarised versions of the equations in this Factsheet and be able to write them out in full under exam conditions.**

**After working through this Factsheet you will:**

- **Have revised the organic chemistry reactions that candidates are required to learn for AS and A2 Chemistry modules.**
- **Have a reference paper as you start to work through questions on organic pathways and synthesis.**

This Factsheet is designed to be used as a revision aid as candidates set about the sometimes daunting task of learning all of the organic reactions required by the A2 Chemistry course.

These spider diagrams represent the reactions in a summarised version, in a visual fashion that suits many learners. They should be used in conjunction with Factsheets 27, 31, 32, 33, 34 and 39, which show the reactions in a more detailed format.

A good way of using this Factsheet to revise effectively would be as follows:

1. Pick a group to revise (e.g. alkanes).
2. Pick a member of that group at random (e.g. propane).
3. Use the spider diagram to help you write out balanced chemical reactions, with conditions, for the organic chemical you have chosen.

(e.g.) Propane and oxygen (combustion)

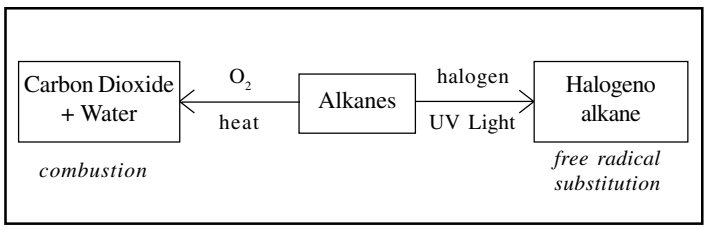
$$C_3H_8 + 5O_2 \xrightarrow{\text{heat}} 3CO_2 + 4H_2O$$

Propane and chlorine (free radical substitution)

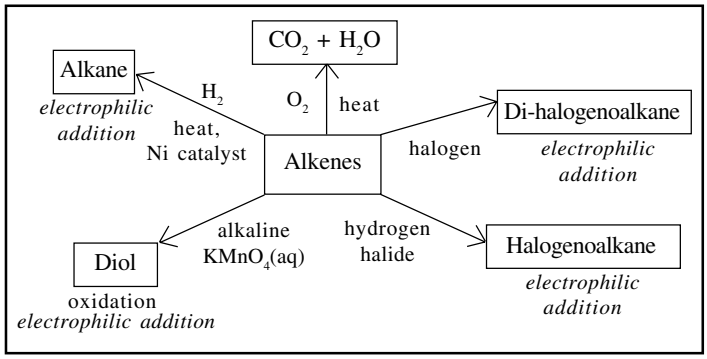
$$C_3H_8 + Cl_2 \xrightarrow{\text{uv light}} C_3H_7Cl + HCl$$

In an exam, candidates are required to apply their knowledge of organic reactions to a wide variety of compounds, so the more of these you do, the better!

**Reactions of alkanes**




**Reactions of alkenes**




**Reactions of alcohols**

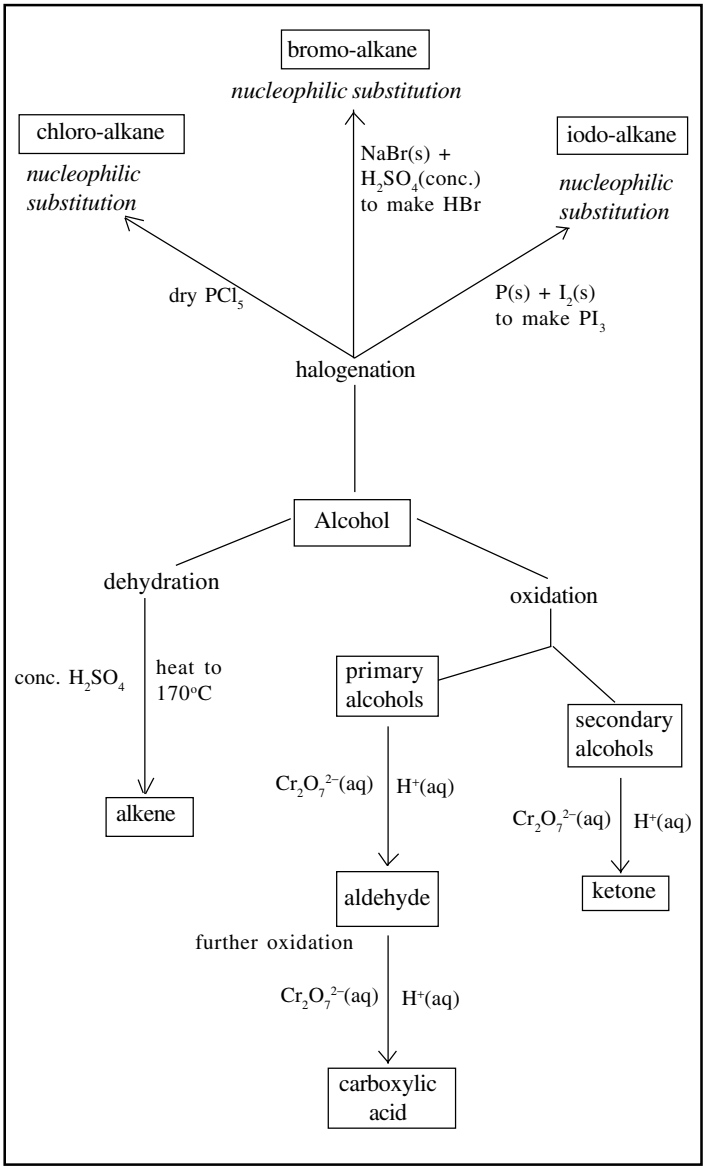
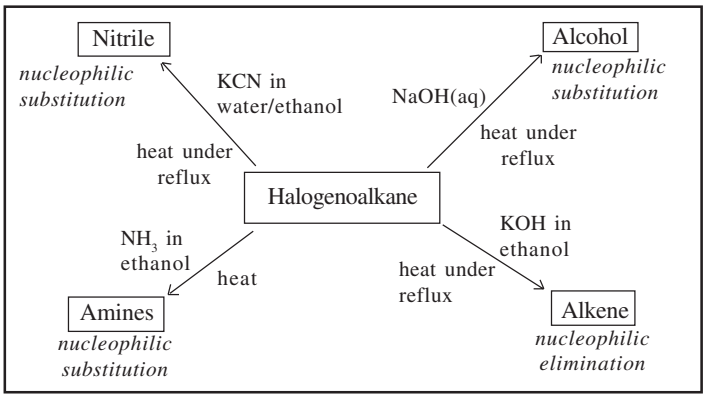
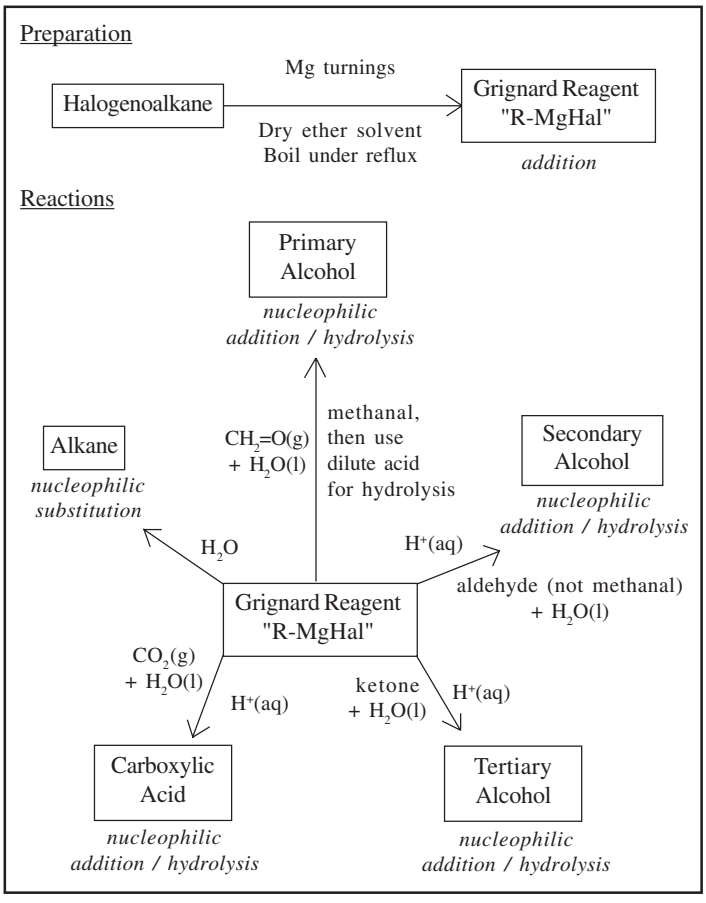


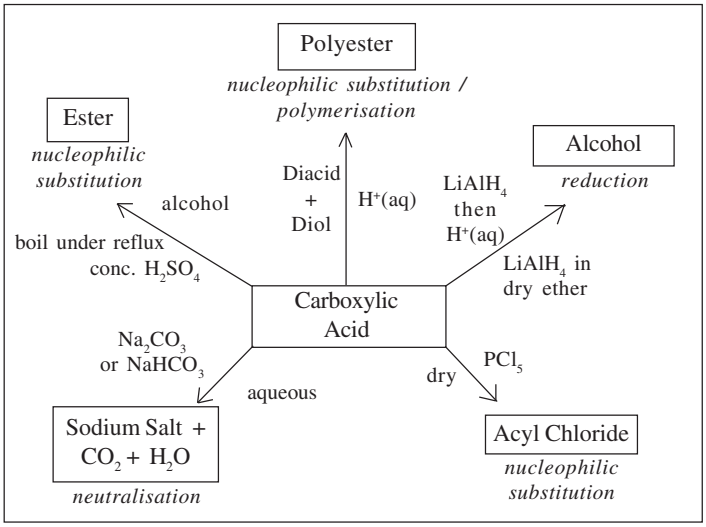
**Fig. 3 Halogenoalkane reactions**



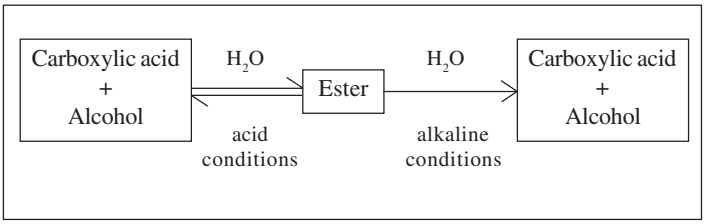

**Grignard Reagents**



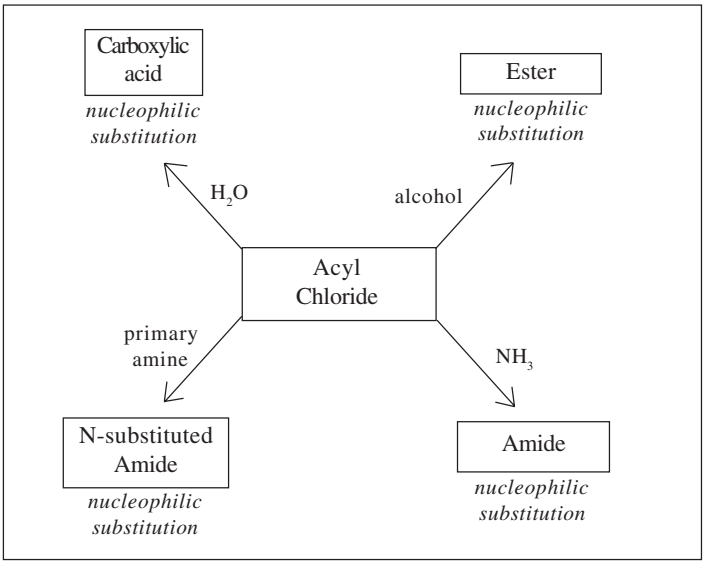

**Carboxylic Acid Reactions**



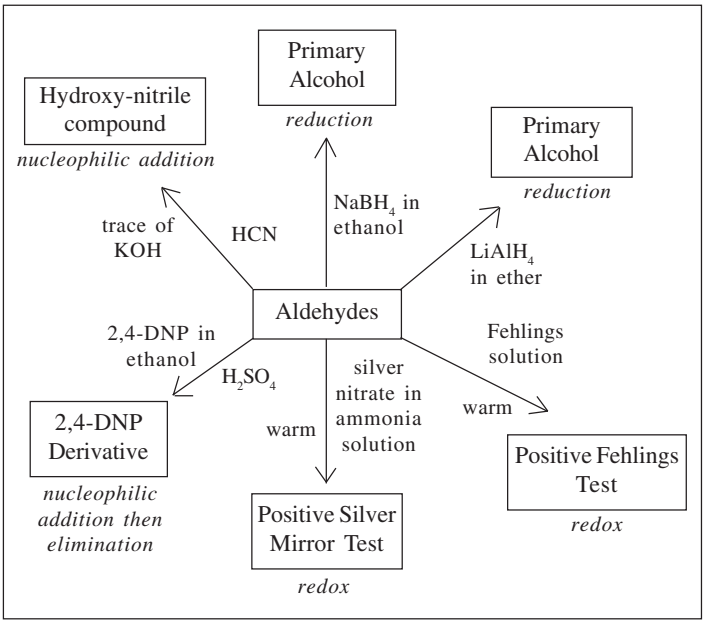

**Ester Reactions**



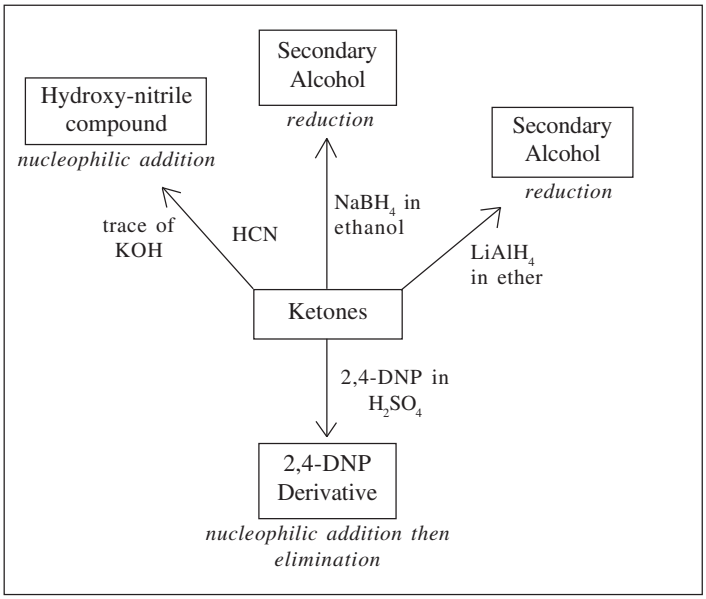

**Acyl Chloride Reactions**



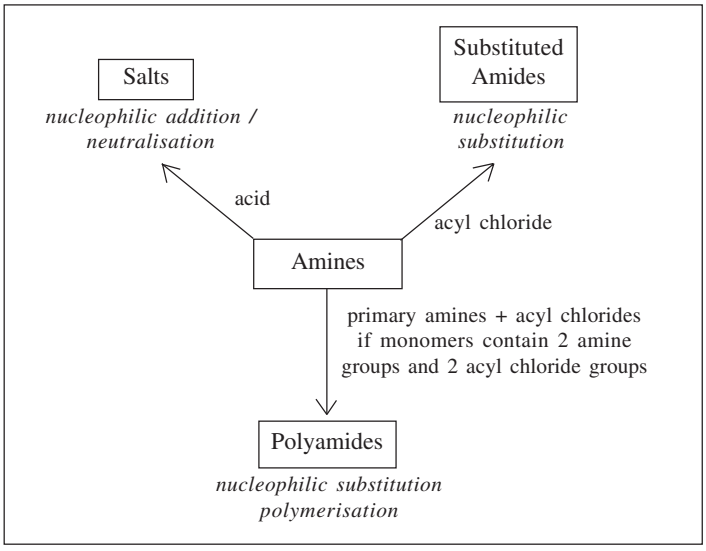

**Reactions of Aldehydes**



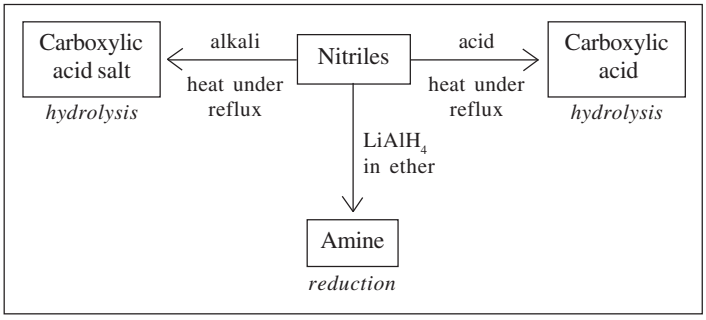
**Reactions of Aldehydes**



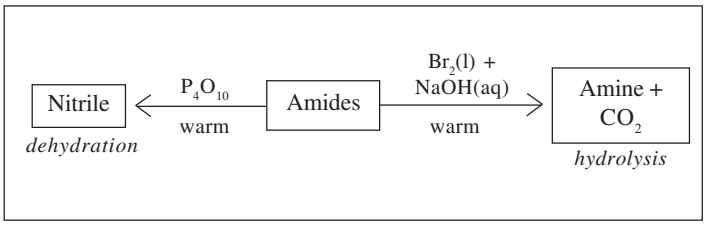

**Reactions of Amines**



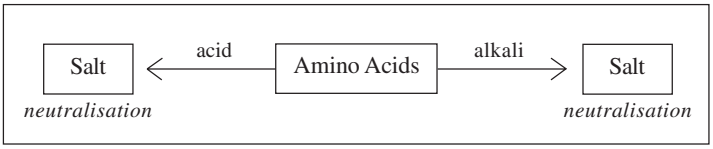

**Reactions of Nitrites**



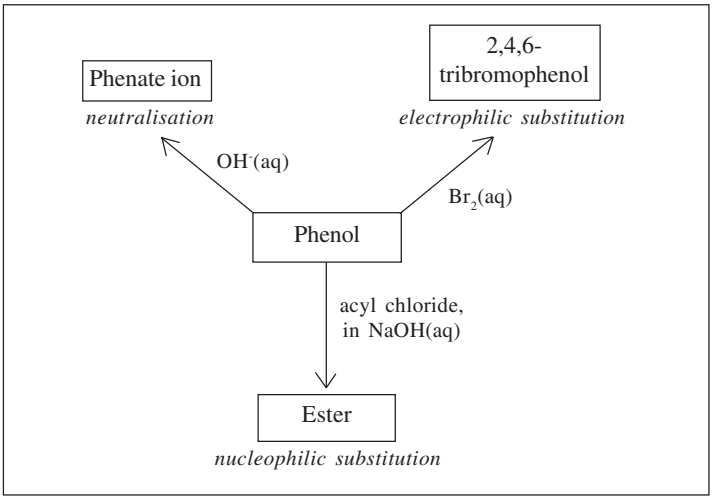

**Reactions of Amides**



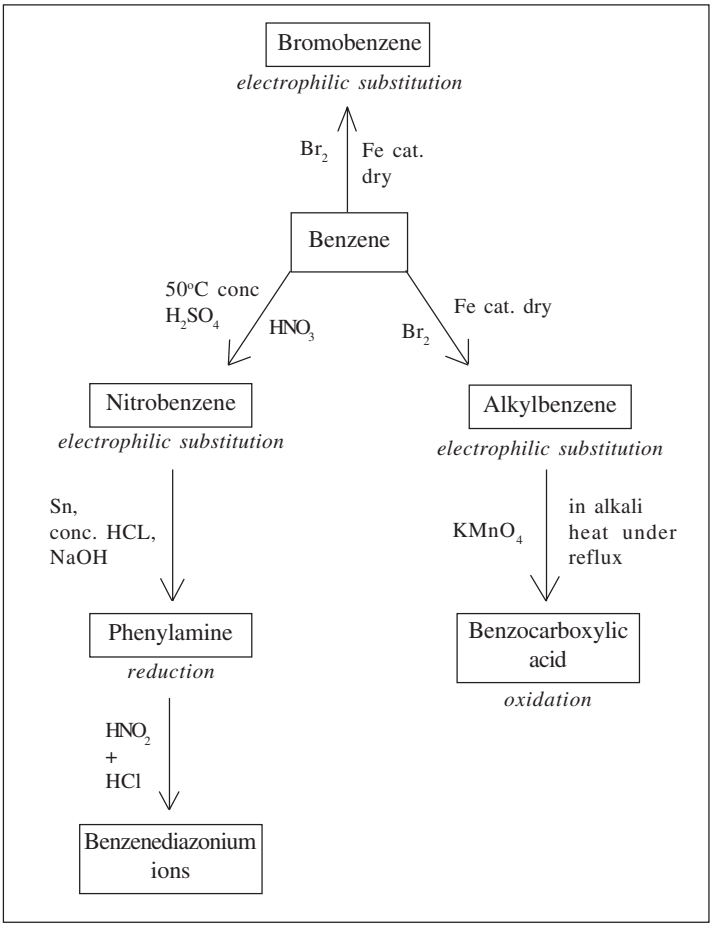

**Reactions of Amino Acids**




**Reactions of Phenol**




**Reactions of Benzene**

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