

6.2.4 Carbon–carbon bond formation

Extending carbon chain length				
(a) the use of C–C bond formation in synthesis to increase the length of a carbon chain (see also 6.1.1 d, 6.1.2 b)				
(b) formation of C-CN by reaction of: (i) haloalkanes with CN ⁻ and ethanol, including nucleophilic substitution mechanism (ii) carbonyl compounds with HCN, including nucleophilic addition mechanism (see also 6.1.2 b–c)				
(c) reaction of nitriles from (b): (i) by reduction (e.g. with H ₂ /Ni) to form amines (ii) by acid hydrolysis to form carboxylic acids				
(d) formation of a substituted aromatic C–C by alkylation (using a haloalkane) and acylation (using an acyl chloride) in the presence of a halogen carrier (Friedel–Crafts reaction) (see also 6.1.1 d).				

6.2.5 Organic synthesis

Practical skills				
(a) the techniques and procedures used for the preparation and purification of organic solids involving use of a range of techniques including: (i) organic preparation • use of Quickfit apparatus • distillation and heating under reflux (ii) purification of an organic solid • filtration under reduced pressure • recrystallization • measurement of melting points				
Synthetic routes				
(b) for an organic molecule containing several functional groups: (i) identification of individual functional groups (ii) prediction of properties and reactions				
(c) multi-stage synthetic routes for preparing organic compounds.				