6.1.1 Aromatic compounds

Benzene and aromatic compounds (a) the comparison of the Kekulé model of benzene with the subsequent delocalised models for benzene in terms of p-orbital overlap forming a delocalised π-system					
(b) the experimental evidence for a delocalised, rather than Kekulé, model for benzene in terms of bond lengths, enthalpy change of hydrogenation and resistance to reaction (see also 6.1.1 f)					
(c) use of IUPAC rules of nomenclature for systematically naming substituted aromatic compounds					
Electrophilic substitution (d) the electrophilic substitution of aromatic compounds with: (i) concentrated nitric acid in the presence of concentrated sulfuric acid (ii) a halogen in the presence of a halogen carrier (iii) a haloalkane or acyl chloride in the presence of a halogen carrier (Friedel–Crafts reaction) and its importance to synthesis by formation of a C–C bond to an aromatic ring (see also 6.2.4 d)					
(e) the mechanism of electrophilic substitution in arenes for nitration and halogenation					
(f) the explanation of the relative resistance to bromination of benzene, compared with alkenes, in terms of the delocalised electron density of the π-system in benzene compared with the localised electron density of the π-bond in alkenes					
(g) the interpretation of unfamiliar electrophilic substitution reactions of aromatic compounds, including prediction of mechanisms					
Phenols (h) the weak acidity of phenols shown by the neutralisation reaction with NaOH but absence of reaction with carbonates					
(i) the electrophilic substitution reactions of phenol: (i) with bromine to form 2,4,6-tribromophenol (ii) with dilute nitric acid to form 2-nitrophenol					
(j) the relative ease of electrophilic substitution of phenol compared with benzene, in terms of electron pair donation to the π-system from an oxygen p-orbital in phenol					
(k) the 2- and 4-directing effect of electrondonating groups (OH, NH_2) and the 3-directing effect of electron-withdrawing groups (NO_2) in electrophilic substitution of aromatic compounds					
(l) the prediction of substitution products of aromatic compounds by directing effects and the importance to organic synthesis (see also 6.2.5 Organic Synthesis).					