

25 Aromatic compounds

Specification reference	Checklist questions	
6.1.1 a	Can you describe 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?	<input type="checkbox"/>
6.1.1 b	Can you describe 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?	<input type="checkbox"/>
6.1.1 c	Can you use IUPAC rules of nomenclature for systematically naming substituted aromatic compounds?	<input type="checkbox"/>
6.1.1 d i	Can you describe the electrophilic substitution of aromatic compound with concentrated nitric acid in the presence of concentrations sulfuric acid?	<input type="checkbox"/>
6.1.1 d ii	Can you describe the electrophilic substitution of aromatic compound with a halogen in the presence of a halogen carrier	<input type="checkbox"/>
6.1.1 d iii	Can you describe the electrophilic substitution of aromatic compound with 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?	<input type="checkbox"/>
6.1.1 e	Can you describe the mechanism of electrophilic substitution in arenes for nitration and halogenation?	<input type="checkbox"/>
6.1.1 f	Can you explain 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?	<input type="checkbox"/>
6.1.1 g	Can you interpret unfamiliar electrophilic substitution reactions of aromatic compounds, including prediction of mechanisms?	<input type="checkbox"/>

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6.1.1 h	Can you describe the weak acidity of phenols shown by the neutralisation reaction with NaOH but absence of reaction with carbonates?	<input type="checkbox"/>
6.1.1 i i	Can you describe the electrophilic substitution reactions of phenol with bromine to form 2,4,6-tribromophenol?	<input type="checkbox"/>
6.1.1 i ii	Can you describe the electrophilic substitution reactions of phenol with dilute nitric acid to form 2-nitrophenol?	<input type="checkbox"/>
6.1.1 j	Can you describe 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?	<input type="checkbox"/>
6.1.1 k	Can you explain the 2- and 4-directing effect of electron-donating groups (OH, NH ₂) and the 3-directing effect of electron-withdrawing groups (NO ₂) in electrophilic substitution of aromatic compounds?	<input type="checkbox"/>
6.1.1 l	Can you predict substitution products of aromatic compounds by directing effects and the importance to organic synthesis?	<input type="checkbox"/>