Subject	Year	Term
Chemistry	12	6

Topic

6.1.1 Aromatics

Content (Intent)

Prior Learning (Topic) C7 Organic chemistry 4.1.1. Basic concepts, 4.1.3 Alkenes,

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 **(see also 4.1.1 h–i)**

(f) the explanation of the relative resistance to brominating 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 **(see also 4.1.3 a, 6.1.1 a)**

(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 **(see also 5.1.3 b)**

(i) the electrophilic substitution reactions of phenol:

(i) with bromine to form 2,4,6-tribromophenol

(ii) with dilute nitric acid to form a mixture of 2-nitrophenol and 4-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 **(see also 4.1.3 a)**

(k) the 2- and 4-directing effect of electron donating groups (OH, NH_2) and the 3-directng 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).**

Future Learning (Topic) 6.2.4 Carbon-carbon bond formation, 6.2.5 Organic synthesis

How will knowledge and skills be taught? (Implementation)	How will your understanding be assessed & recorded (Impact)
Practical work PAG 6.3 Preparation of methyl 3-benzoate ILPAC 8.2 Reactions of phenols *Written* Evidence for the delocalised electron ring system in benzene Naming substituted aromatic compounds	- exam questions in lessons and homework - 1 x standard homework on aromatic compounds (grade given. Written feedback. Verbal feedback to the group.)

Comparing and explaining benzene to alkenes and their reaction with bromine Properties of phenol Comparing and explaining benzene to phenol and their reaction with bromine Directing groups and effect on further substitution	

How can parents help at home?

Look at the topic specific resources on the VLE
Use appropriate websites: MachemGuy, Allery Chemistry, Chemistry World – by Royal Society of Chemistry, ChemGuide.
Take an interest! Ask your children what they have learnt and be curious about their learning.

Helpful further reading/discussion

Reading	**Vocabulary Lists**	**Careers Links**
The Science of Everyday Life by Marty Jopson Why Chemical Reactions Happen by Keeler and Wothers Chapter 25 of A level chemistry for OCR	*Benzene* *Delocalised π system* *Kekule* *Nomenclature* *Electrophilic substitution* *Halogen carrier* *Electron density* *Electron-donating* *Electron-withdrawing*	Analytical chemist Chemical engineer Clinical biochemist Forensic scientist Pharmacologist Process chemist Quality control analyst Research scientist Science writer Site chemist Teacher or lecturer Degrees; Chemistry Biochemistry Biomedical science Biological sciences Medicine Research chemist Veterinary medicine