

| Subject | Year | Term |
|---|---|------|
| Chemistry | 12 | 3 |
| Topic | | |
| 4.1.2 Alkanes | | |
| Content (Intent) | | |
| Prior Learning (Topic) KS4 Y9 C7 Organic chemistry KS5 Y12 4.1.1 Basic concepts | | |
| <p>Properties of alkanes</p> <p>(a) alkanes as saturated hydrocarbons containing single C–C and C–H bonds as σ-bonds (overlap of orbitals directly between the bonding atoms); free rotation of the σ-bond</p> <p>(b) explanation of the tetrahedral shape and bond angle around each carbon atom in alkanes in terms of electron pair repulsion (see also 2.2.2 g–h)</p> <p>(c) explanation of the variations in boiling points of alkanes with different carbon-chain length and branching, in terms of induced dipole–dipole interactions (London forces) (see also 2.2.2 k)</p> <p>Reactions of alkanes</p> <p>(d) the low reactivity of alkanes with many reagents in terms of the high bond enthalpy and very low polarity of the σ-bonds present (see also 2.2.2 j)</p> <p>(e) complete combustion of alkanes, as used in fuels, and the incomplete combustion of alkane fuels in a limited supply of oxygen with the resulting potential dangers from CO</p> <p>(f) the reaction of alkanes with chlorine and bromine by radical substitution using ultraviolet radiation, including a mechanism involving homolytic fission and radical reactions in terms of initiation, propagation and termination (see also 4.1.1 f–g)</p> <p>(g) the limitations of radical substitution in synthesis by the formation of a mixture of organic products, in terms of further substitution and reactions at different positions in a carbon chain.</p> | | |
| <p>Future Learning (Topic) KS5 Y12 4.1.3 Alkenes 4.2.1 Alcohols 4.2.2 Haloalkanes 4.2.3 organic synthesis 4.2.4 Analytical techniques Y13 6.1.1 Aromatic compounds 6.2.4 Carbon-carbon bond formation 6.2.5 Organic synthesis</p> | | |
| How will knowledge and skills be taught? (Implementation) | How will your understanding be assessed & recorded (Impact) | |
| Presentation, notes, worked examples, molymods, model answers and exam style questions. | - 1 x standard homework (Grade given. Written feedback. Response expected.) | |
| How can parents help at home? | | |
| <p>Look at the topic specific resources on the VLE</p> <p>Use appropriate websites: MachemGuy, Allery Chemistry, Chemistry World – by Royal Society of Chemistry, ChemGuide.</p> <p>Take an interest! Ask your children what they have learnt and be curious about their learning.</p> | | |
| Helpful further reading/discussion | | |

| Reading | Vocabulary Lists | Careers Links |
|--|--|---|
| <p>Text book Chapter 12 p.190-195</p> <p>The Science of Everyday Life by Marty Jopson</p> <p>Why Chemical Reactions Happen by Keeler and Wothers</p> | <p><i>Hydrocarbon</i></p> <p>σ-bonds</p> <p>tetrahedral</p> <p><i>bond enthalpy</i></p> <p><i>combustion</i></p> <p><i>radical substitution</i></p> <p><i>ultraviolet</i></p> <p><i>initiation</i></p> <p><i>propagation</i></p> <p><i>termination</i></p> | <p>Analytical chemist</p> <p>Chemical engineer</p> <p>Clinical biochemist</p> <p>Forensic scientist</p> <p>Pharmacologist</p> <p>Process chemist</p> <p>Quality control analyst</p> <p>Research scientist</p> <p>Science writer</p> <p>Site chemist</p> <p>Teacher or lecturer</p> <p>Degrees;</p> <p>Chemistry</p> <p>Biochemistry</p> <p>Biomedical science</p> <p>Biological sciences</p> <p>Medicine</p> <p>Research chemist</p> <p>Veterinary medicine</p> |