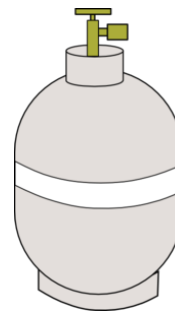


# Alkanes



The key areas of study in this topic are:

- Properties of alkanes
- Reactions of alkanes

By the end of this topic I should be able to:

	Start	End
Describe alkanes as saturated hydrocarbons containing single C–C and C–H bonds which are $\sigma$ -bonds (overlap of orbitals directly between the bonding atoms) and can rotate freely		
Explain (and draw) the tetrahedral shape and bond angle around each carbon atom in alkanes in terms of electron pair repulsion		
Explain the variations in boiling points of alkanes with different carbon-chain length and branching, in terms of induced dipole–dipole interactions		
Explain the low reactivity of alkanes with many reagents in terms of the high bond enthalpy and very low polarity of the $\sigma$ -bonds present		
Describe the 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		
Describe the reaction of alkanes with chlorine and bromine by radical substitution using ultraviolet radiation, including a mechanism involving homolytic fission and radical reactions (initiation, propagation and termination)		
Explain 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.		

In all topic areas you should be able to demonstrate and apply your knowledge and understanding.

