

## Chemistry – Organic chemistry – Checklist

4.7.1 Carbon compounds as fuels and feedstock			
<p>Describe the formation of crude oil.</p> <p>Describe the composition of crude oil.</p> <p>Define a hydrocarbon.</p> <p>Explain what is meant by the formula <math>C_nH_{2n+2}</math></p> <p>Make molecular models and work out general formula for the alkanes.</p> <p>Draw the covalent bonding in:</p> <ul style="list-style-type: none"> <li>• methane</li> <li>• ethane</li> <li>• propane</li> <li>• butane.</li> </ul> <p>Define the term saturated.</p>			
<p>Describe the process of fractional distillation.</p> <p>Grade 9: explain the process of fractional distillation in terms of intermolecular forces of attraction.</p> <p>Suggest the impact on fuels, feedstocks and petrochemicals of the depleting stocks of crude oil.</p> <p>Describe a life without oil or oil derived products.</p> <p>Look at the cultural and environmental impact of the oil industry around the world.</p>			
<p>Explain the properties of hydrocarbons in relation to intermolecular forces.</p> <p>Write balanced symbol equations for the combustion of hydrocarbon fuels.</p> <p>Describe the balanced symbol equation including moles present, reactants and products.</p>			
<p>Describe the process of cracking.</p> <p>Explain the process of cracking.</p> <p>Write balanced symbol equations for the cracking of alkanes.</p> <p>Describe the balanced symbol equation including moles present, long alkane reactant, specific reaction conditions, and alkene and short alkane products.</p>			

4.7.2 Reactions of alkenes and alcohols			
<p>Explain what is meant by the formula <math>C_nH_{2n}</math></p> <p>Grade 9: draw the covalent bonding in:</p> <ul style="list-style-type: none"> <li>• ethene</li> <li>• propene</li> <li>• butene</li> <li>• pentene.</li> </ul> <p>Define the term unsaturated.</p>			
<p>Write balanced symbol equations for the combustion of alkenes in oxygen.</p> <p>Describe the balanced symbol equation including moles present, reactants and products.</p> <p>Write the reaction between an alkene and hydrogen, giving suitable examples.</p> <p>Describe the reaction including moles present, reactants and products.</p> <p>Write the reaction between an alkene and water, giving suitable examples.</p> <p>Describe the reaction including moles present, reactants and products.</p> <p>Write the reaction between an alkene and a halogen molecule, giving suitable examples.</p> <p>Describe the reaction including moles present, reactants and products.</p> <p>Grade 9: show the reaction mechanisms for the addition of hydrogen/water/halogen across the double bond.</p>			
<p>Grade 9: draw the covalent bonding in:</p> <ul style="list-style-type: none"> <li>• methanol</li> <li>• ethanol</li> <li>• propanol</li> <li>• butanol.</li> </ul> <p>Describe what happens to one of the first four alcohols during the reactions:</p> <ul style="list-style-type: none"> <li>• dissolving in water to form a neutral solution</li> <li>• reacting with sodium to produce hydrogen</li> <li>• burning in air</li> <li>• oxidising to produce carboxylic acids</li> <li>• use as fuels and solvents.</li> </ul>			
<p>Grade 9: draw the covalent bonding in:</p> <ul style="list-style-type: none"> <li>• methanoic acid</li> <li>• ethanoic acids</li> <li>• propanoic acid</li> <li>• butanoic acid.</li> </ul>			

4.7.2 Reactions of alkenes and alcohols			
<p>Describe what happens to one of the first four acids during the reactions:</p> <ul style="list-style-type: none"> <li>• dissolving in water to produce acidic solutions</li> <li>• reacting with carbonates to produce carbon dioxide</li> <li>• not ionising completely when dissolved in water (they are weak acids)</li> <li>• reacting with alcohols in the presence of an acid catalyst to produce esters, for example ethanoic acid reacts with ethanol to produce ethyl ethanoate and water.</li> </ul>			
4.7.3 Synthetic and naturally occurring polymers			
<p>Define:</p> <ul style="list-style-type: none"> <li>• monomer</li> <li>• polymer</li> <li>• polymerisation</li> <li>• repeating unit.</li> </ul> <p>Describe the process of polymerisation.</p>			
<p>Describe what takes place during condensation polymerisation. Identify monomers, polymers and repeating units.</p>			
<p>Describe the polymerisation of ethane-1,2-diol and hexanedioic acid.</p>			
<p>Describe the polymerisation of amino acids to produce polypeptides.</p>			
<p>Describe the structure of DNA in terms of two polymer chains and nucleotides.</p>			
<p>Research and present the discovery of the structure of DNA including the contributions of Francis Crick, James Watson, Maurice Wilkins and Rosalind Franklyn.</p>			