

A3.5

CHECK YOUR KNOWLEDGE AND UNDERSTANDING (PART 1)

This activity helps you to check your knowledge and understanding of the topics you have covered in Chemical Storylines A1 to A3.

Introduction

The checklist below covers the key points in **Chemical Storylines A1 to A3**.

The statements listed correspond to learning outcomes in the specification for the AS examinations. They are listed in the order in which they occur in this module. Remember that you will be coming back to many of the ideas in later modules.

You will probably have made summary notes of the main ideas that you have met. Now is a good time to make sure that your notes cover all the points you need. If you feel that you are not yet able to meet the requirements of all of the statements in the list, you should look again at the areas concerned, seek help from your teacher if necessary and develop your notes accordingly.

Most of the points are covered in **Chemical Ideas**, with supporting information in **Chemical Storylines** or the activities. However, if the main source of information is in a storyline or an activity this is indicated.

What you do

Read and think about each of the statements in the checklist. Put a tick in the column that best represents your current ability to do what is described:

A – I am confident that I can do this

B – I need help to clarify my ideas on this

C – I am not yet able to do this.

You will be sharing this information with your teacher so that you can work together to improve your understanding.

At the end of Chemical Storylines A1 to A3 you should be able to:	A	B	C
<ul style="list-style-type: none">recall the gases present in the atmosphere (nitrogen, oxygen, argon, carbon dioxide) and their percentages, and the polluting gases and their sources from the DF module			
<ul style="list-style-type: none">calculate, from given data, values for composition by volume measured in percentage concentration and in parts per million (ppm)			
<ul style="list-style-type: none">use a radical mechanism as a model to explain the reaction of alkanes with halogens (a radical chain reaction in the presence of UV radiation to form halogenoalkanes)			
<ul style="list-style-type: none">recall the following regions of the electromagnetic spectrum in order of increasing frequency – infrared (IR), visible (red–blue), ultraviolet (UV)recall, in terms of these, the principal radiations of the Earth and the Sun			
<ul style="list-style-type: none">recall that:<ul style="list-style-type: none">– molecules change in vibrational energy states (bonds vibrate more) when they absorb IR radiation– UV and visible radiation promote electrons to higher energy levels, sometimes causing bond breaking– vibrational and electronic energies of molecules are quantised			
<ul style="list-style-type: none">calculate values for frequency and energy of electromagnetic radiation using the equation $E = h\nu$			
<ul style="list-style-type: none">recall (and explain in terms of collision theory) the way that concentration, pressure and surface area affect the rate of a reaction			
<ul style="list-style-type: none">explain and use the terms enthalpy profile and activation enthalpy			
<ul style="list-style-type: none">use the concept of activation enthalpy to explain the qualitative effect of temperature changes on rate of reaction			
<ul style="list-style-type: none">explain the role of catalysts in providing alternative routes of lower activation enthalpy			
<ul style="list-style-type: none">explain homogeneous catalysis in terms of the formation of intermediates			

continued

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<ul style="list-style-type: none"> explain the chemical basis of the depletion of ozone in the stratosphere due to halogenoalkanes, in simple terms involving the formation of halogen atoms and the catalytic role of these atoms (and other radicals) in ozone destruction explain the ease of photodissociation of the halogenoalkanes (fluoroalkanes to iodoalkanes) in terms of bond enthalpy 			
<ul style="list-style-type: none"> describe the difference between homolytic and heterolytic bond fission and recognise examples 			
<ul style="list-style-type: none"> recall the formation, nature and reactivity of radicals and explain the mechanism of a radical chain reaction involving initiation, propagation and termination 			
<ul style="list-style-type: none"> recall the way ozone is formed and destroyed in the stratosphere; recall the effects of ozone in the atmosphere, including: <ul style="list-style-type: none"> ozone's action as a sunscreen in the stratosphere by absorbing high energy UV (and the effects of such UV, including on human skin) polluting effects of ozone in the troposphere, causing problems including photochemical smog <p style="text-align: right;">Chemical Storylines A3</p>			