



Sacred Heart High School

# APPLIED SCIENCE

Chemistry Transition Task

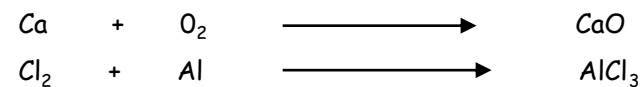
# C1 REVISION – CHAPTER 1 – FUNDAMENTAL IDEAS

Draw the symbol for sodium include its atomic mass and atomic number (what do they tell us)

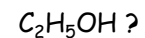
What are the charges and masses of electrons, protons and neutrons

Write down all you know about the periodic table

Balance the following equation:



How many atoms and elements are there is:



Where are electrons and neutrons and protons found in an atom?

Draw the electronic configuration for argon

Describe how sodium and chlorine bond;

What is covalent bonding?

## KEY WORDS:

Electron  
Proton  
Neutron  
Shell  
Electronic Configuration  
Orbit

## ASSESSMENT:



# C1 REVISION – CHAPTER 4 – CRUDE OIL & FUELS

Name the process by which we separate crude oil into useful components:

What property does this process rely on?

What does 'saturated' mean?

Give a problem each pollutant causes:

*Carbon Dioxide*

*Sulphur Dioxide*

*Carbon Monoxide*

*Nitrogen Oxide*

*Particulates*

Give the benefits and drawbacks of each alternative fuel

	BENEFITS	DRAWBACKS
<b>BIODIESEL</b> (more detail required for this one!)		
<b>ETHANOL</b>		
<b>HYDROGEN</b>		

Complete the table to summarise alkanes and alkenes:

	ALKANES	ALKENES
Saturated or unsaturated		
General formula		
Name an example		
Draw an example		

**KEY WORDS:**

ALKANE  
 ALKENE  
 SATURATED  
 FRACTIONAL DISTILLATION  
 ALTERNATIVE FUEL  
 POLLUTANT  
 COMBUSTION

**ASSESSMENT:**



# C2 REVISION – CHAPTER 1 – Structure & Bonding

## Chemical Bonding

Elements react to form compounds by what 3 methods?

What do atoms of metals in Group 1 make when they combine with atoms of non-metals in Group 7?

A metal atom loses electrons and forms \_\_\_\_\_ ions.

When non-metallic elements join together they form \_\_\_\_\_ bonds.

How many electrons do elements in Group 1 have in their outer shell?

## Covalent bonding

When is a covalent bond formed?

Which group need to gain a single electron therefore forming a single covalent bond?

How many bonds can an atom of an element in Group 5 make?  
Draw a diagram using symbols and lines to show the covalent bonds in oxygen  $O_2$  and hydrogen sulfide  $H_2S$ .

## Ionic Bonding

Ionic compounds are held together by \_\_\_\_\_ forces between oppositely charged ions.  
The ions form a giant \_\_\_\_\_ strong forces of attraction act throughout the structure.

What type of diagram is used to represent atoms and ions?

Draw a diagram showing sodium atoms and chlorine atoms.

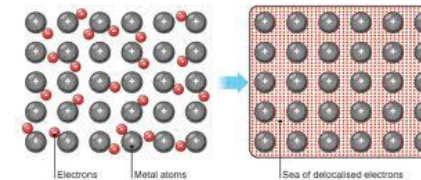
## Formulae of Ionic compounds

Why are ionic compounds neutral?

Write the formula for calcium fluoride, copper(II) chloride and iron(III) hydroxide.

## Metals

Atoms in metals are closely packed and arranged in layers. In the highest energy level the electrons are delocalised. This means they can move about freely between atoms.



The delocalised electrons strongly attract the positive ions and hold the giant structure together.

## KEY WORDS:

Covalent  
Ion  
Ionic  
Delocalised  
Lattice

## ASSESSMENT:



# C2 REVISION – CHAPTER 2 – Structure & Properties

## Properties of Polymers

What do the properties of a polymer depend on?

What can also change the properties of a polymer that is produced?

What is the difference between thermosoftening polymers and thermosetting polymers?

## Properties

	Melting point high/low	State at room temperature	Do they carry electrical charge?	Do they conduct electricity?
Giant ionic structures				
Simple molecules				
Giant covalent structures				
Giant metallic structures				

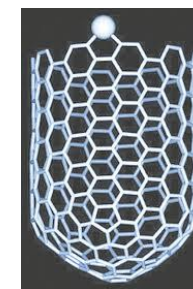
## Nanoscience

This is the study of small particles that are between 1 and 100 nanometres in size.

How big is a nanometre?

Nanoparticles behave differently from the bulk materials they are made of.

Why does research need to be done into possible issues that might arise from increased use?



**KEY WORDS:**  
 Macromolecule  
 Fullerene  
 Intermolecular  
 Nanoscience  
 Shape memory alloy

**ASSESSMENT:**



## C2 REVISION – CHAPTER 3 – How much cont.

### Equations & Calculations

Chemical equations show the \_\_\_\_\_ and products of a reaction.

Balanced symbol equations can be used to calculate the masses of reactants and products in a chemical reaction.

Don't forget correct units if calculating mass!

### Reversible reactions

In a reversible reaction the \_\_\_\_\_ of the reaction can react to make the original reactants.

What sign is used to show a reversible reaction?

Ammonium chloride decomposes to produce ammonia and hydrogen chloride, when cooled ammonia and hydrogen chloride react to produce \_\_\_\_\_.

### Instrumental analysis

Modern instrumental techniques provide fast, accurate and sensitive ways of analysing chemical substances. Compounds in a mixture can be separated using what?

Once the compounds are separated they can be identified using what?

In gas chromatography the mixture is carried by a gas through a long column packed with particles of a solid. Individual compounds travel at \_\_\_\_\_ speeds through the column and come out at different times, the \_\_\_\_\_ of substance is recorded against time. The retention time can be compared with results for known compounds to identify the compounds in the mixture.

### Yield of a chemical reaction

Percentage yield =  $\frac{\text{(amount of product collected)}}{\text{maximum amount of product possible}} \times 100\%$

The yield of a chemical reaction describes what?

The percentage yield of a chemical reaction tells us how much product is made compared with the maximum amount that could be made.

Why is it important to maximise yield and minimise energy wasted?

### Analysing substances

What substances are added to food to improve its qualities?

What can be used to detect and identify artificial colours?

#### KEY WORDS:

Yield  
Reversible reaction  
Chromatography  
Mass spectrometer

#### ASSESSMENT:



## C2 REVISION – CHAPTER 5 – Salts & Electrolysis

### Acids & Alkalis

Name the ion produced in the solution when acids are added to water.

What will neutralise acids?

What do alkalis produce when dissolved in water?

What are the pH values of acids?

What are the pH values of alkalis?

What is the state symbol that shows that the ions are in aqueous solution?

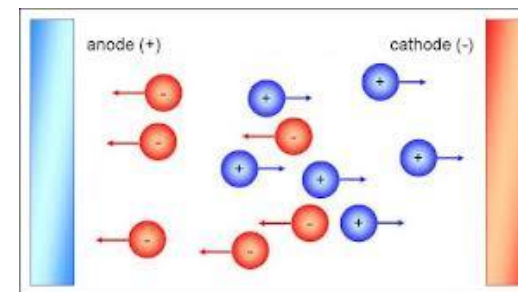
### Electrolysis

Electrolysis breaks down ionic compounds into elements using what?

Why must the ionic compounds be molten or in solution for electrolysis to work?

When positively charged ions are attracted to the negative electrode, what two things might they form?

Negatively charged ions are attracted to the positive electrode, they then lose their charge and form what?



### Making salts from metals or bases

When an acid reacts with a base what are the products?

What is produced as well as a salt when a metal reacts with an acid?

How are salts crystallised?

Acids will react with metals that are above hydrogen in what series?

Chlorides are made from hydrochloric acid, so what are made from nitric acids?

### Making salts from solutions

When a soluble salt is made, what can be used to show the reaction is complete?

How can insoluble salts be made?

What is used as an important way of removing some metal ions from industrial waste water?

You will be told about the solubility of salts in any exam question so you will not need to remember which salts are soluble or insoluble.

### KEY WORDS:

Neutral  
Acid  
Alkali  
Aqueous  
Neutralisation  
Inert  
Precipitate

### ASSESSMENT:



## C2 REVISION – CHAPTER 5 – Salts & Electrolysis cont.

### Changes at the electrodes

Negative ions \_\_\_\_\_ electrons and so are \_\_\_\_\_ at the positive electrode.

Positive ions gain electrons and so are \_\_\_\_\_ at the \_\_\_\_\_ electrode.

The half equations for lead bromide are:

**At the negative electrode:**  $\text{Pb}^{2+}(\text{l}) + 2\text{e}^- \rightarrow \text{Pb}(\text{l})$

**At the positive electrode:**  $2\text{Br}(\text{l}) \rightarrow \text{Br}_2(\text{g}) + 2\text{e}^-$

What does OILRIG stand for?

### Extraction of Aluminium

Aluminium oxide is mixed with molten cryolite to do what?

Aluminium forms at the negative electrode, what is formed at the positive electrode?

Why do the carbon electrodes need to be replaced regularly?

### Electroplating

Name three reasons for electroplating objects.

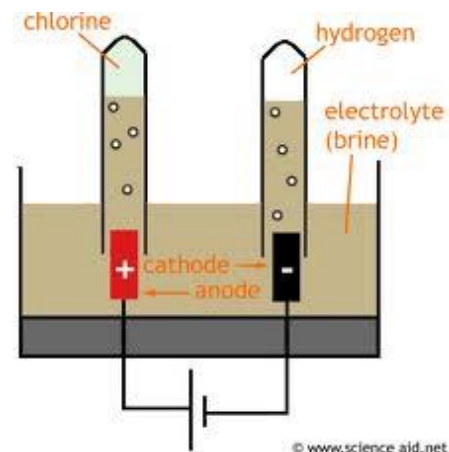
How does electroplating work?

### Electrolysis of brine

Brine is a solution of what?

What are the half equations for the reactions at the electrodes?

What three products do we get when we electrolyse brine?



### KEY WORDS:

Reduction  
Oxidation  
Electrolyte  
Inert

### ASSESSMENT:

