Noadswood Science

Revision Cards

Science A (Core) – Chemistry Basics

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How to use the revision cards

It is suggested you cut the pack of cards out, so that there is a question on one side and the answer on the reverse…

Jumble the cards up and try to learn through them all (when you're 100% confident you know one of the cards you can tick it)

Question

Question on one side

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Answer

Answer on reverse

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Question

What is an atom made up of?

Question

How are the number of protons and electrons related?

Question

How many types of atom does an element have?

Question

How are elements represented and where are they found?

Question

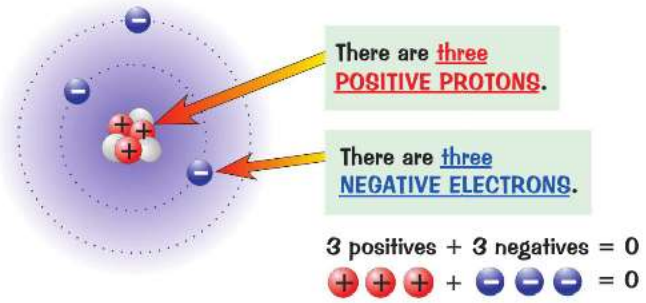
Where are elements with similar properties found in the periodic table?

Question

Which group are the noble gases found in and where are the alkali metals found in?

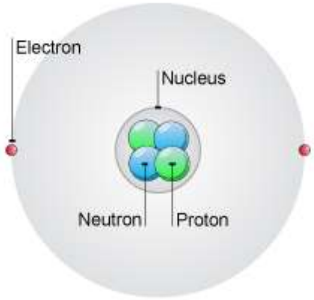
Answer

The number of protons = the number of electrons (atoms have no overall charge)



Answer

Atoms contain a nucleus (made of protons and neutrons) and electrons which orbit around in shells



Answer

Elements are shown by a symbol beginning with a capital letter

All elements are shown in the periodic table

Answer

An element has only one type of atom (there are around 100 different types of atom, e.g. gold, oxygen, copper etc…)

Answer

Noble gases are found in group 0

Alkali metals are found in group 1

Answer

Elements with similar properties are put into columns (e.g. group 1 are all similar, group 2 are all similar etc…)

Question

In the periodic table what does the mass number and atomic number of an element shown?

Question

How do electrons fill up around atoms in the shells?

Question

Draw out the electrons surrounding nitrogen (which has 7 electrons)

Question

How do atoms join together to form compounds?

Question

Draw an example of a covalent bond between two non-metals

Question

Draw an example of an ionic bond between a metal and a non-metal

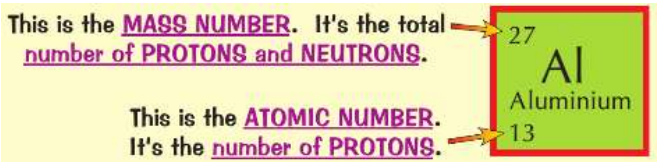
Answer

Electrons are found in shells: 2 can fill the first shell then 8 can fill the others

Answer

Mass number: protons + neutrons

Atomic number: protons (∴ electrons)



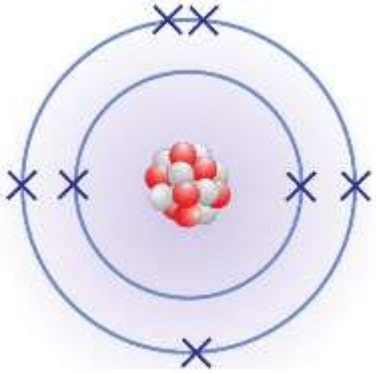
Answer

Atoms can give / take electrons (ionic bonding)

Atoms can share electrons (covalent bonding)

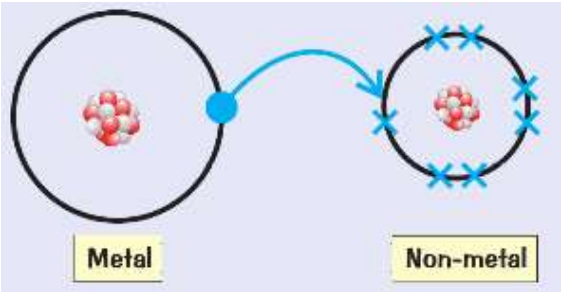
Answer

2 electrons in the first shell and 7 in the second shell



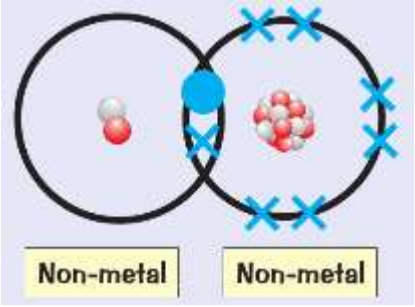
Answer

The metal atom loses an electron (becomes a +ve ion) and the non-metal atom gains an electron (becomes a -ve ion)



Answer

Two non-metal atoms share a pair of electrons



Question

What happens to the number of atoms during a reaction?

Question

What is limestone and what is it used for?

Question

What happens when limestone ($CaCO_3$) is heated?

Question

What happens when limestone ($CaCO_3$) is added to acid?

Question

What happens when calcium oxide is added to water?

Question

How is limestone useful?

Answer

Limestone is calcium carbonate (dug up from the ground and used as a building material)

Answer

Atoms are not lost or made in a chemical reaction (the reactants you start with = the products you end with)

Answer

Calcium carbonate is broken down into a salt, water and carbon dioxide

This is why buildings can get damaged from acid rain

Answer

Calcium carbonate is thermally decomposed into calcium oxide + carbon dioxide

Calcium carbonate ➔ calcium oxide + carbon dioxide

Answer

Limestone is used to make cement (heated with clay)

Cement can be mixed with sand and water to make mortar

Cement can be mixed with sand, water and gravel to make concrete

Answer

Calcium oxide reacts with water to form calcium hydroxide (limewater)

Calcium oxide + water ➔ calcium hydroxide

Question

What are the advantages and disadvantages of using limestone as a building material?

Question

How can metals be extracted?

Question

Which metals can be extracted using carbon?

Question

What is electrolysis?

Question

Draw a simple diagram of electrolysis

Question

What is bioleaching?

Answer

Some metals are found as ores – they can be mined, extracted and purified

Answer

Advantages: limestone is cheap, is easily cut and concrete is extremely useful

Disadvantages: quarrying limestone causes noise, pollution and is ugly. Limestone is also damaged by acid rain

Answer

Electrolysis uses electricity to break down substances (like purifying aluminum)

Electricity breaks the substance into ions which move to a charged electrode

Answer

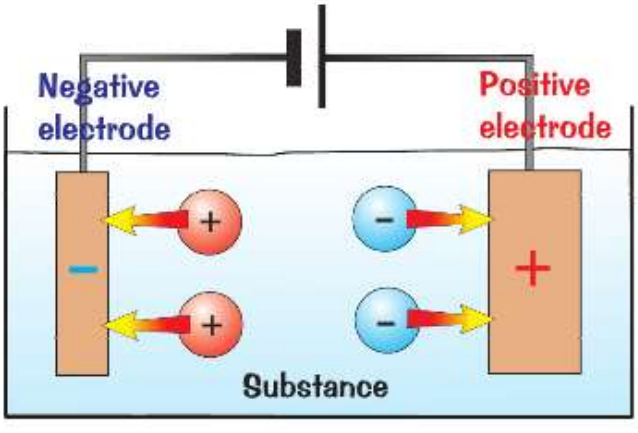
Metals below carbon can be extracted using it (reduction)

Answer

Bioleaching uses bacteria to extract copper from an ore

Answer

More reactive metals than carbon must be extracted using electrolysis



Question

What is phytomining?

Question

Why is recycling important?

Question

What are the properties of metals?

Question

What is an alloy?

Question

What is crude oil and how is it used?

Question

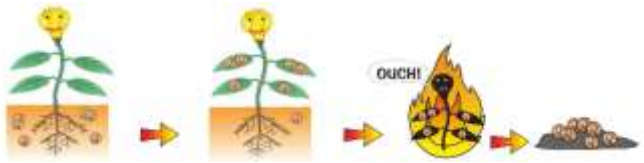
What is an alkane?

Answer

There are finite resources so recycling is important (less rubbish; saves energy; saves money etc…)

Answer

Phytomining is where plants are grown in soil with copper in it – the plants absorb the copper and when burnt leave the copper behind



Answer

An alloy is a mixture of two materials (one of which is a metal) getting the best properties of each

E.g. iron + carbon make steel which is easily shaped, hard and does not corrode

Answer

Metals are strong, bendy and conduct well (some like aluminum are light / some like titanium don't rust etc…)

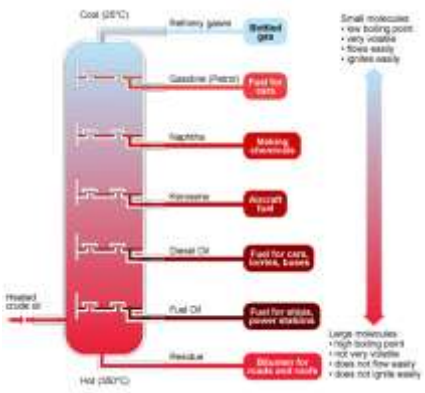
Answer

An alkane is a hydrocarbon with the formula:

C_nH_{2n+2}

Answer

Crude oil is a hydrocarbon – it needs to be split into fractions to be useful (such as petrol, diesel, natural gas etc…)



Question

What is an alkene?

Question

How is crude oil used and what associated problems are there?

Question

What is global warming?

Question

What is global dimming?

Question

What is cracking and how does it work?

Question

Draw out a diagram for cracking and say what it produces

Answer

Crude oil is used as a fuel – however it will run out one day and also produces a lot of CO_2 when burnt which can lead to global warming

Fossil fuels also release sulfur dioxide when burnt which can lead to acid rain

Answer

An alkene is a hydrocarbon (with a double bond) with the formula:

C_nH_{2n}

Answer

Global dimming is caused by particles from fossil fuel burning blocking sunlight

Answer

Global warming is caused by carbon dioxide released due to burning fossil fuels causing the Earth's temperature to warm

Answer

Cracking produces alkanes and alkenes

Answer

Cracking makes long hydrocarbons shorter (which are more useful)

Cracking requires heat to break down the hydrocarbons

Question

What is the test for an alkene?

Question

How is ethanol (alcohol) produced?

Question

What can be used to make polymers?

Question

What are the properties and uses of polymers?

Question

How are plant oils obtained and used?

Question

What is the difference between saturated and unsaturated?

Answer

Ethene can be reacted with steam to make ethanol

Ethanol can also be produced via fermentation

Answer

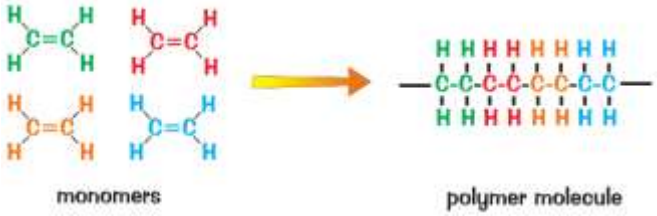
Bromine water – goes from red/orange to colourless if an alkene is present (containing a double bond)

Answer

Polymers are used for waterproof clothing, tooth fillings, plasters etc… however most do not biodegrade (meaning they need to be recycled)

Answer

Alkenes can be joined together to form polymers (e.g. many ethane molecules form poly(ethane))



Answer

Saturated: no double bond; bromine water stays red/orange if added; carry a high risk of heart disease

Unsaturated: C=C double bond; change bromine water colourless; lowers risk of heart disease

Answer

Plant oils can be crushed and pressed to release their oil

Vegetable oils are used in foods (have lots of energy) and are used in cooking as they have higher boiling points than water so they cook the food quicker

They can also be used as fuels such as biodiesel

Question

What is an emulsion?

Question

What is an emulsifier?

Question

What is Wegener's theory of continental drift?

Question

What is the structure of the Earth like?

Question

What is contained in Earth's atmosphere?

Question

How has Earth's atmosphere changed over time?

Answer

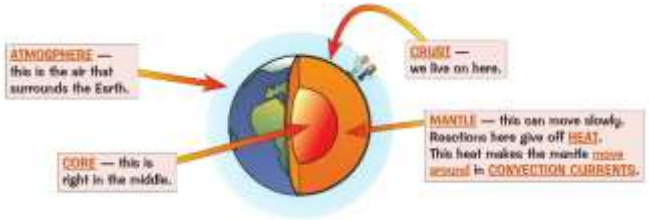
Emulsifiers are added to emulsions to stop them separating

Answer

An emulsion is something which does not mix (such as oil and water) – they are thick and used as ice cream, moisturisers, salad dressing etc…

Answer

Earth has an inner core, outer core, mantle and crust



Tectonic plates are constantly shifting around (but can move quickly such as during an earthquake)

Answer

Continents fit like a jigsaw and matching fossils and rocks suggest the continents are constantly shifting

Answer

1. Early atmosphere lots of methane and carbon dioxide

2. Water condensed to form oceans and much less carbon dioxide (with tress beginning)

3. Trees release oxygen and carbon dioxide levels reduced

Answer

The atmosphere is made of nitrogen (79%); oxygen (20%); argon (1%) and other gases