GCSE Chemistry Paper 2 Edexcel Notes.

Key Concepts:

1.1 Describe how the Dalton model of an atom has changed over time because of the discovery of subatomic particles

Dalton believed all atoms of an element are identical, different elements have different atoms. Thomson Plum pudding model- big sphere of sponge, with loads of fruit. The sponge was made of positive charges with embedded negative charges (electrons).

Rutherford gold foil experiment- Fired alpha particles (positive helium nuclei) at gold foil, most of them passed straight through. If it was like the plum pudding model it should not have passed through, leading to the understanding of the atom being very largely spaced. Some alpha particles were deflected. This means the alpha particles must have hit something else positive to be deflected. 2 same charged particles deflect/repel, 2 different, attract. Very few particles were deflected, this tells us the nucleus is small.

1.2 Describe the structure of an atom as a nucleus containing protons and neutrons, surrounded by electrons in shells



1.3 Recall the relative charge and relative mass of:

a a proton

b a neutron

c an electron

	relative charge	relative mass
proton	+1	1
neutron	0 neutral	1
electron	-1	1 / 1840

plus chlorine reacts to form sodium chloride. something reacting with bromine will end with bromide, something reacting with iodine will react to end with iodide.

6.10 Recall that the halogens, chlorine, bromine and iodine, form hydrogen halides which dissolve in water to form acidic solutions, and use this pattern to predict the reactions of other halogens

Halogens form hydrogen halides which dissolve in water to form acidic solutions. When chlorine reacts with hydrogen, hydrogen chloride is formed. Hydrogen chloride dissolves in water to form hydrochloric acid

6.11 Describe the relative reactivity of the halogens chlorine, bromine and iodine, as shown by their displacement reactions with halide ions in an aqueous solution, and use this pattern to predict the reactions of astatine

When a more reactive element displaces a less reactive element from one of its compounds. You can demonstrate displacement reactions by adding a halogen solution to a metal halide solution and seeing if the mixture darkens. For example, chorine in 'chorine water' displaces bromine from aqueous sodium bromide solution.

6.12 Explain why these displacement reactions are redox reactions in terms of gain and loss of electrons, identifying which of the substances are oxidised and which are reduced Halogen displacement reactions are redox reactions, e.g when chlorine displace bronkine from bromide ions in a solution the chlorine atoms gain electrons and are reduced to chloride ions and the bromide ions lose electrons and are oxidised to bromget users.

6.13 Explain the relative reactivity of the halogers in terms of electronic configurations A halogen atom has seven electrons in its puter shell. Where halogen reacts unhwith a metal or hydrogen each halogen atom rate one electron to sumplete its outer shell. The more easily the halogen atom gain an electron, the more reactive the halogen is.

6.14 Enpain Poly the noble gases and connically inert, compared with the other elements, in terms of their electronic configurations

The noble gases are chemically inert as they have a lack of reactivity because they have outer shell electrons so have the tendency to not lose gain or share electrons.

6.15 Explain how the uses of noble gases depend on their inertness, low density and/or non-

flammability + 6.16 Describe the pattern in the physical properties of some noble gases and use this pattern to predict the physical properties of other noble gases

Noble gas	Use	Property needed		Reason for use
		Low density	Inertness	
helium	lifting gas in party balloons and airships	~	1	 helium is less dense than air so the balloons and airships rise it is non-flammable so does not ignite
argon krypton xenon	filling gas in filament lamps		1	 the metal filament becomes hot enough to glow the inert gases stop it burning away
argon	shield gas during welding		~	 argon is denser than air so it keeps air away from the metal it is inert so the metal does not oxidise

8.11 Explain how impurities in some hydrocarbon fuels result in the production of sulfur dioxide

Hydrocarbon fuels may contain impurities such as sulfur compounds. When the fuel burns the sulfur in these impurities is oxidised to form sulfur dioxide.

8.12 Explain some problems associated with acid rain caused when sulfur dioxide dissolves in rainwater



Petrol	Hydrogen
burns easily	burns easily
a does not produce ash	& does not produce ash or smoke
Produces carbon dioxide and carbon monoxide as well as water when it burns	& only produces water when it burns
releases more energy per kg when it burns than fuels such as coal or wood	releases nearly three times as much energy per kg as petrol
is a liquid, so it is easy to store and transport	 is a gas, so it has to be stored at high pressure filling stations would need to be adapted for hydrogen to be used in cars

8.15 Recall that petrol, kerosene and diesel oil are non-renewable fossil fuels obtained from crude oil and methane is a nonrenewable fossil fuel found in natural gas

These fossil fuels are obtained from crude oil:

Petrol – for cars

Diesel oil - for some cars and trains

Kerosene - for large ships and some power stations

Methane used for domestic cooking and heating is a fossil fuel that is obtained from natural gas.

8.25 Evaluate the evidence for a human activity causing climate change, considering: a correlation between the change in atmospheric carbon dioxide concentration, the consumption of fossil fuels and temperature change b the uncertainties caused by the location where these measurements are taken and historical accuracy

Here you need to be able to evaluate the evidence for the human activity being the <u>cause</u> of climate change. There appears to be a very good correlation between atmospheric carbon dioxide concentration and the consumption of fossil fuels. So this means that as more fossil fuels have been burnt, there appears to be a greater concentration of CO2 in the atmosphere. Similarly, the more CO2 there is in the atmosphere the higher the temperature has been. Correlation is useful, but this alone doesn't prove that humans are <u>definitely</u> causing climate change.

There are some issues with this data that show these correlations:

1) The oldest available temperature data is for one location, whereas for global warming we need global temperatures (which are not available for as far back in time)

2) The instruments used for old temperature measurements are not very accurate, so we can't be as confident in this data compared to current data.

8.26 Describe: a the composition of today's atmosphere b the potential effects on the climate of increased levels of carbon dioxide and methane generated by human doxity, including burning fossil fuels and livestock farming c that these effects may be mitigated d: consider scale, risk and environmental implication

a) Burning fossil fuels increases carbon dioxide in metal cosphere. Livestock farming (e.g. cattle) increases methane in the atmosphere. If these two gases (which are produced by human activity), continue to increase, they are likely to have an effect on the climate. The effects could be:

- more coopolar ice and glage () etting
- Rising sea levels lead to more flooding
- Extinction of some plants/animals that cannot survive warmer temperatures (or find new places to live)
- More drought in some areas
- More extreme weather events

b) The effects of climate change can be lessened by:

- Using renewable energy resources (instead of fossil fuels)
- Using large mirrors to reflect sunlight back into space
- Capture CO₂ from the air and bury it underground
- Building flood defences

However, some of these solutions could cost lots of money, so will require different countries to contribute. Secondly, some of these actions require everyone to agree, because one country alone will not be effective in solving the problem. Hence there needs to be a global solution. There is a risk that it might be expensive and still not work well enough. Lastly, some solutions might have a negative environmental impact, like building flood defences might damage habitats.