GCSE REVISION 1

Atoms, ions, equations, Periodic Table

1 a) Complete the following table about protons, neutrons and electrons.

	neutron	proton	electron
relative charge	**0**	**+1**	**-1**
relative mass	**1**	**1**	**0.0005**

b) Define the term **mass number**. **Number of protons + neutrons**

c) Define the term **atomic number** **Number of protons**

2 Complete the following table about some atoms and ions. The first row has been done for you.

Particle	Atom or ion	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons	Electron structure
$^{19}_{9}F^{-}$	ion	9	19	9	10	10	2,8
$^{40}_{18}Ar$	**atom**	**18**	**40**	**18**	**22**	**18**	**2,8,8**
$^{27}_{13}Al^{3+}$	**ion**	**13**	**27**	**13**	**14**	**10**	**2,8**
$^{34}_{16}S^{2-}$	**ion**	**16**	**34**	16	18	18	**2,8,8**
$^{39}_{19}K^{+}$	**ion**	**19**	**39**	19	20	18	**2,8,8**
$^{31}_{15}P$	**atom**	**15**	**31**	15	16	15	**2,8,5**

3 The element indium consists of two isotopes. 4.3% of the atoms are $^{113}_{49}In$ and 95.7% of the atoms are $^{115}_{49}In$.

a) What makes both of these atoms of the element indium? **have 49 protons**

b) What are isotopes **atoms with the same number of protons but different number of neutrons**

c) Calculate the relative atomic mass of indium. Give your answer to 4 significant figures.

$$\frac{(113 \times 4.3) + (115 \times 95.7)}{4.3 + 95.7} = 114.9$$

4 The diameter of an indium atom is 310 pm.

a) What is the diameter of an indium atom in metres? Give your answer in standard form.

310×10^{-12} m = 3.10×10^{-10} m.

b) How many indium atoms would fit in a line 20 cm long? Give your answer to 3 significant figures.

$$\frac{0.20}{3.10 \times 10^{-10}} = 6.45 \times 10^{8} \text{ atoms}$$

5 This question is about the Periodic Table

a) Name each of the following groups.

Group 1 **alkali metals**

Group 7 **halogens**

Group 0 **noble gases**

b) Which group would the following elements be in?

element with electron structure 2,8,6 **group 6**

element with electron structure 2,8,8 **group 0**

element with electron structure 2,8,18,3 **group 3**

6 Balance each of the following equations.

a) $\mathbf{4}K + O_2 \rightarrow \mathbf{2}K_2O$

b) $CaCO_3 + \mathbf{2}HCl \rightarrow CaCl_2 + H_2O + CO_2$

c) $C_3H_8 + \mathbf{5}O_2 \rightarrow \mathbf{3}CO_2 + \mathbf{4}H_2O$

Area	Strength	To develop	Area	Strength	To develop	Area	Strength	To develop
Done with care and thoroughness			Can find PNE numbers in ions			Can use standard form		
Good SPG			Knows what determines an element			Can convert units		
Knows mass and charge of PNE			Knows what isotopes are			Can name common PT groups		
Can define atomic & mass numbers			Find A_r from isotope data			Determine group from electron structure		
Can find PNE numbers in atoms			Can use sig figs			Balance equations		