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| (a) | The terms: atomic number, mass number, isotope, Avogadro constant (NA), relative isotopic mass, relative atomic mass (Ar), relative formula mass, relative molecular mass (Mr). | Y1/AS EL1 pg 10 &  EL6 pg 36-41 |  |  |  |  |
| (b i) | The concept of amount of substance (moles) to perform calculations involving: masses of substances, empirical and molecular formulae, percentage composition, percentage yields and water of crystallisation. | Y1/AS EL6 pg 36-45 &  EL9 pg 61-62 |  |  |  |  |
| (b ii) | The techniques and procedures used in experiments to measure masses of solids. | EL9 pg 61-62, T&P pg 286 |  |  |  |  |
| (c i) | The concept of amount of substance (moles) to perform calculations involving; concentration (titration and making/diluting standard solutions). | Y1/AS EL9 pg 62-67 |  |  |  |  |
| (c ii) | The techniques and procedures used in experiments to: measure volumes of solutions, prepare standard solutions from solids or by dilution and carry out acid base titrations. | Y1/AS T&P pg 289 |  |  |  |  |
| (d) | Balanced full and ions chemical equations (including state symbols). | Y1/AS EL7 pg 48-51 |  |  |  |  |
| (e) | Conventions for representing the distribution of electrons in atomic orbitals; the shapes of s- and p- orbitals. | Y1/AS EL3 pg 22 |  |  |  |  |
| (f) | The electronic configuration (using sub-shells and atomic orbitals) of the atoms from H(1) to Kr(36), ions of these atoms (s- and p- block only) and outer sub-shell structures. | Y1/AS EL3 pg 19-24 & EL4 pg 29 |  |  |  |  |
| (g) | How knowledge of the structure of the atom developed in terms of a succession of gradually more sophisticated models; interpretation of these and other examples of such developing models. | Transition Work  Y1/AS EL1 pg 10 |  |  |  |  |
| (h) | Fusion reactions: lighter nuclei join to give heavier nuclei (high T and P); this is how certain elements are formed. | Y1/AS EL1 pg 12 |  |  |  |  |
| (i) | Chemical bonding in terms of electrostatic forces; simple ‘dot-cross’ diagrams of the electron arrangements in ions and covalent and dative covalent bonds. | Y1/AS EL5 pg 31-33 &  EL7 pg 48-49 |  |  |  |  |
| (j) | The bonding in giant lattice (metallic, ionic, covalent network) and simple molecular structure types; the typical physical properties (m.pt., solubility in water, electrical conductivity) characteristic of these structure types. | Y1/AS EL7 pg 47-54 |  |  |  |  |
| (k) | The use of the electron pair repulsion theory based on ‘dot-cross’ diagrams to predict, explain and name the shapes of simple molecules (BeCl2, BF3, CH4, NH3, H2O and SF6) and ions (NH4+) with up to six outer pairs of electrons (any combination of bonding pairs/lone pairs); assign bond angles to these structures (bp-bp < bp-lp < lp-lp). | Y1/AS EL5 pg 33-35 |  |  |  |  |
| (l) | Structures of compounds that have a sodium chloride type lattice. | Y1/AS EL7 pg 48-49 |  |  |  |  |
| (m) | The periodic table as a list of elements in order of atomic (proton) number that groups elements together according to their common properties; using given information, make predictions concerning the properties of an elements in a group; the classification of elements into s-, p- and d-blocks. | Y1/EL3 pg 25-29 |  |  |  |  |
| (n) | The periodic trends in the melting points of elements in periods 2 and 3, in terms of structure and bonding. | Y1/AS EL4 pg 27-29 |  |  |  |  |
| (o) | The relationship between the position of an element in the s-or p-block of the periodic table and the charge on its ion; the names and formulae of NO3-, SO42-, CO32-, OH-,NH4+, HCO3-, Cu2+, Zn2+, Pb2+, Fe2+, Fe3+; formulae and makes for compounds formed between these ions and other given anions and cations. | Y1/AS EL7 pg 50-51 |  |  |  |  |
| (p) | A description and comparison of the following properties of the elements and compounds of Mg, Ca, Sr and Ba in group 2: reactions of the elements with water and oxygen, thermal decomposition of the carbonates, solubilities of hydroxides and carbonates. | Y1/AS EL8 pg 59-60 |  |  |  |  |
| (q) | The term ionisation enthalpy; equations for the first ionisation of elements; explanations for periods 2 and 3 and groups and the resulting differences in reactivities of s- and p-block metals in terms of their ability to lose electrons. | Y1/AS EL8 pg 56-58 |  |  |  |  |
| (r) | Charge density of an ion and its relation to the thermal stability of group 2 carbonates | Y1/AS EL8 pg 59 |  |  |  |  |
| (s) | The solubility of compounds formed between Li+, Na+, K+, Ca2+, Ba2+, Cu2+, Fe2+, Fe3+, Ag+, Pb2+, Zn2+, Al3+, NH4+, CO32-, SO42-, Cl-, Br-, I-, OH-, NO3-.   * Colours of any precipitates formed * Use of these ions as tests (e.g. Ba2+ as test for SO42-) * A sequence of tests leading to the identification of a salt containing the ions above. | Y1/AS EL7 pg 50-51 |  |  |  |  |
| (t) | The terms: acid, base, alkali, neutralisation | Y1/AS EL9 pg 62-63 |  |  |  |  |
| (t) | Techniques an procedures for making soluble salts by reacting acids and bases and insoluble salts by precipitation reactions | Activity ES2.2,  T&P pg 284-286 |  |  |  |  |
| (u) | The basic nature of oxides and hydroxides of group 2 (Mg – Ba). | Y1/AS EL8 pg 60 |  |  |  |  |
| (v) | The electromagnetic spectrum in order of increasing frequency and energy and decreasing wavelength: IR, Vis, uv. | Y1/AS EL2 pg 14-15 |  |  |  |  |
| (w) | Transitions between electronic energy levels in atoms:  (i) The occurrence of absorption and emission atomic spectra in terms of transition of electrons between electronic energy levels and (ii) key features of, similarities and differences.  (iii) The relationship between the energy emitted or absorbed and the frequency of the line spectra (E = hν) and (iv) the relationship between frequency, wavelength and the speed of electromagnetic radiation (c = νλ)  (v) Flame colours of Li+, Na+, K+, Ca2+, Ba2+, Cu2+. | Y1/AS EL2 pg 16-19 |  |  |  |  |
| (x) | Use of data from a mass spectrum to determine relative abundance of isotopes and calculate the relative atomic mass of an element. | Y1/AS EL1 pg 11 |  |  |  |  |