The City School

Curriculum Distribution Chart

Subject:Chemistry 2019-2020

Scheme of work/Term wise syllabus breakup

Class Level: 10

Term 1				
STRAND	UNIT	TOPIC	OBJECTIVE	WEEK
	5.-Energy from Chemicals	Energy from Chemicals	(a) describe the meaning of enthalpy change in terms of exothermic (ΔH negative) and endothermic (ΔH positive) reactions (b) represent energy changes by energy profile diagrams, including reaction enthalpy changes and activation energies (see 6.1(c)) (c) describe bond breaking as an endothermic process and bond making as an exothermic process (d) explain overall enthalpy changes in terms of the energy changes associated with the breaking and making of covalent bonds (e) describe combustion of fuels as exothermic, e.g. wood, coal, oil, natural gas and hydrogen (f) describe hydrogen, derived from water or hydrocarbons, as a fuel, reacting with oxygen to generate electricity directly in a fuel cell (details of the construction and operation of a	2

			fuel cell are not required) and discuss the advantages and disadvantages of this (g) name natural gas, mainly methane, and petroleum (crude oil) as sources of energy (h) describe petroleum (crude oil) as a mixture of hydrocarbons and its separation into useful fractions by fractional distillation (i) name the following fractions and state their uses (i) petrol (gasoline) as a fuel in cars (ii) naphtha as feedstock for the chemical industry (iii) paraffin (kerosene) as a fuel for heating and cooking and for aircraft engines (iv) diesel as a fuel for diesel engines (v) lubricating oils as lubricants and as a source of polishes and waxes (vi) bitumen for making road surfaces (j) describe photosynthesis as the reaction between carbon dioxide and water in the presence of chlorophyll, using sunlight (energy) to produce glucose and explain how this can provide a renewable energy source	
	3.-Formulae, stoichiometry and the mole concept	Stoichiometry and the mole concept	*(a)* define relative atomic mass, A_r *(b)* define relative molecular mass, M_r, and calculate relative molecular mass (and relative formula mass) as the sum of relative atomic masses *(c)* calculate the percentage mass of an element in a compound when given appropriate information	5

			(d) calculate empirical and molecular formulae from relevant data *(e)* calculate stoichiometric reacting masses; use Avogadro's law in calculations involving gas volume (one mole of gas occupies 24 dm^3 at room temperature and pressure); calculations involving the idea of limiting reactants may be set (questions on the gas laws and the calculations of gaseous volumes at different temperatures and pressures will not be set) *(f)* apply the concept of solution concentration (in mol / dm^3 or g / dm^3) to process the results of volumetric experiments and to solve simple problems (appropriate guidance will be provided where unfamiliar reactions are involved) *(g)* calculate % yield and % purity	
	6.-Chemical reactions	6.1-Rate of reaction	*(a)* describe the effect of concentration, pressure, particle size and temperature on the rates of reactions and explain these effects in terms of collisions between reacting particles *(b)* define the term *catalyst* and describe the effect of catalysts (including enzymes) on the rates of reactions *(c)* explain how pathways with lower activation energies account for the increase in rates of reactions *(d)* state that transition elements and their compounds act as catalysts (see 8.3) in a range of industrial processes and that enzymes are biological catalysts *(e)* suggest a suitable method for investigating the effect of a given variable on the rate of a reaction *(f)* interpret data obtained from experiments concerned with rate of reaction	2

		ATP	Practice of compulsory short-answer and structured questions designed to test familiarity with laboratory practical procedures. Learners need to revise concepts of grade 9 for ATP. (Experimental Designs, Methods of Purification, Acids, Bases and Salts, Identification of ions, Titration & Diffusion)	4
Term 2				
	6.-Chemical reactions	6.2-Redox	*(a)* define oxidation and reduction (redox) in terms of oxygen/hydrogen gain/loss *(b)* define redox in terms of electron transfer *(c)* identify redox reactions in terms of oxygen/hydrogen, and/or electron, gain/loss (calculation of oxidation numbers is **not** required) *(d)* describe the use of aqueous potassium iodide in testing for oxidising agents and acidified potassium manganate(VII) in testing for reducing agents from the resulting colour changes	1
		6.3.-Reversible Reaction in term of Haber's Process and Contact Process	*(a)* describe the idea that some chemical reactions can be reversed by changing the reaction conditions *(b)* describe the idea that some reversible reactions can reach dynamic equilibrium and predict and explain the effect of changing the conditions	4
		7.3.-Properties and uses of ammonia	(a) describe the use of nitrogen, from air, and hydrogen, from cracking hydrocarbons, in the manufacture of ammonia (b) state that some chemical reactions are reversible (e.g. manufacture of ammonia) (c) describe and explain the essential conditions for the manufacture of ammonia by the Haber process	1

			(d) describe the use of nitrogenous fertilisers in promoting plant growth and crop yield (e) compare nitrogen content of salts used for fertilisers by calculating percentage masses (f) describe eutrophication and water pollution problems caused by nitrates leaching from farm land and explain why the high solubility of nitrates increases these problems (g) describe the displacement of ammonia from its salts and explain why adding calcium hydroxide to soil can cause the loss of nitrogen from added nitrogenous fertiliser	
		7.4.-Sulfuric acid	(a) describe the manufacture of sulfuric acid from the raw materials sulfur, air and water in the contact process (b) state the use of sulfur dioxide as a bleach, in the manufacture of wood pulp for paper and as a food preservative (by killing bacteria) (c) state the uses of sulfuric acid in the manufacture of detergents and fertilisers, and as a battery acid	1