

CLASS- YEAR 12 SCIENCE/MATHS		SUBJECT - CHEMISTRY		TEACHER - JAGATH RANASINGHE		
WEEK	MONTH	TOPIC	INTENDED LEARNING OBJECTIVES	REMARKS		
1	SEPTEMBER					
	1.1.1	Understanding the terms/concepts of atom,element, ion, molecule, compound,empirical	Define the terms and explain and concepts of atom,element, ion, molecule, compound,empirical formula,isotopes, molecular formula, RAM, RFM, ppm, moles, molar volume of gases, and to calculate percentage yield and atom economy using the concept of moles related applications. To determine the chemical equations through precipitate reactions			
	1.1.2	Different applications of the above concepts				
	1.1.3	Ionic bonding and covalent bonding				
	1.1.4	Balancing chemical equations and writing ionic equations using state symbols				
2	1.1.5	Determining chemical equations through precipitation reactions				
	1.1.6	Assessment				
	1.3	Atomic structure and the periodic table				
3	1.3.1	Introduction to mass spectrometer and it's applications	Write the electronic configuration of the element up to 54 th in the periodic table. Explain the evidences to prove that electrons are present in energy levels. Explain the periodic properties in the periodic table and predict the properties of unknown elements depending on the position in the periodic table			
	1.3.2	Understanding the arrangement of electrons in atoms				
	1.3.3	Ionization energy and how it proves the existence of quantum shells				
	1.3.4	Writing electronic configurations in the 1s..... notation				
4	1.3.5	Electron density maps				
	1.3.6	periodic table and it's properties and trends				
		Assessment				
	1.2	Energetics and enthalpy changes				
5	1.2.1	Introduction to endothermic and exothermic reactions and how to represent them graphically. ΔH	Identify the difference between endothermic and exothermic reactions. Define the standard enthalpies and use them in Hess's cycle and Born Haber cycles to find the unknown enthalpies using experimental data and theoretical data and to predict the thermal and kinetic stability of hypothetical and real compounds.			
	1.2.2	The use of calorimeters in determining the enthalpies of reactions and the errors of such methods				
	1.2.3	Calculating enthalpy changes using calorimeter experiments. $\Delta Q = mC \Delta T$				
	1.2.4	Definition of enthalpies of formation, combustion, atomisation & neutralisation and its applications				
	1.2.5	Introduction to Hess's Law				
6	1.2.6	Definition of enthalpies of mean bond, bond dissociation, ionization, lattice energy and electron affinity				
	1.2.7	Calculations using the above enthalpies and the use of Hess's Law.				
	1.2.8	Explaining the concept of stability in thermodynamic and kinetic perspectives				
		Assessment				
	1.4	Bonding				

7	1.4.1	The nature of ionic bonding and lattice energy	Explain the nature and the properties of Ionic, Covalent and Metallic bonds. Explain the trends in lattice energy using the polarization
	1.4.2	The trends in ionic radii, polarization of ions and predicting stability of ionic compounds	
	1.4.3	Metallic and dative covalent bonding	
		Assessment	
8	1.5	Introductory organic chemistry	Identify the risks and hazards in order to reduce the risk in laboratory and day to day work. Name the organic compounds and write the structural and displayed formula of isomers
	1.5.1	Risk and hazards and how to reduce risk	
	1.5.2	Classification of organic compounds and introduction to new homologous series	
	1.5.3	The IUPAC nomenclature of organic compounds	
	1.5.4	Isomerism of organic compounds and their structures	
		Assessment	
9	1.6	The Alkanes - a family of saturated hydrocarbons	Explain the properties of alkanes and the application of them in crude oil industry. Write mechanism for the halogenation of alkanes. Write the names and formulae of isomers
	1.6.1	The properties and natural existence of alkanes	
	1.6.2	Fractional distillation of crude oil	
	1.6.3	Heterolytic and homolytic fission	
10	1.6.4	Free radical reactions (Initiation, propagation and termination)	
		Assessment	
	1.7	The Alkenes - a family of unsaturated hydrocarbons	
	1.7.1	Isomerism of alkenes and the nomenclature	Explain the properties of alkenes and the application of them in polymer industry. Write mechanism for the reactions of alkenes. Write the names and formulae of isomers
NOVEMBER			
11	1.7.2	Introduction to electrophiles and nucleophiles and the usage of curly arrows	
	1.7.3	Addition reactions of alkenes	
	1.7.4	Polymerization and recycling	
		Assessment	
12	2	APPLICATION OF CORE PRINCIPLES OF CHEMISTRY	Predict the shapes of molecules and ions using electron repulsion theory. Define and write examples for allotropes
	2.1	Shapes of molecules and ions	
	2.1.1	Using of electron repulsion theory to predict shapes of simple molecules	
	2.1.2	Lone pairs and bond angles	
	2.1.3	Shapes of simple organic molecules	
	2.1.4	Allotropes of carbon and nano chemistry	
		Assessment	
13	2.2	Intermediate bonding and bond polarity	Identify and explain the trends in electronegativity and the application of it to explain the polarity of molecules and chemical bonds.
	2.2.1	Introduction to electronegativity	
	2.2.2	Distinguish between polar bonds and polar molecules	
	2.2.3	Properties of water	
14		Assessment	
	2.3	Intermolecular forces	
15	2.3.1	Permanent dipoles, instantaneous - induced dipole and London Forces	Identify the properties such as fixed points and of substances depending on the intermolecular bonds present in compounds and elements.
	2.3.2	Hydrogen bonding	
	2.3.3	Characteristics of each intermolecular force	
	2.3.4	Trends in alkanes	
	2.3.5	Solubility of substances and the patterns	

December			
16	Revision & past papers		
17	Withdrawal Examination		
18	December vacation		
19	December vacation		
JANUARY			
20	Discussion of term test paper		
	2.4	Redox	
	2.4.1	Oxidation and reduction	Find the oxidation number of a given element in a compound or an ion and use them to identify reduction and oxidation reactions. Write balanced equations for half and full redox reactions
	2.4.2	Disproportionation	
	2.4.3	Writing balanced chemical/ionic equations using the concepts of redox	
	Assessment		
21	2.5	The periodic table - groups 2 and 7	
	2.5.1	Trends in ionization energies, reactions with oxygen/water/acids	Explain the trends in the groups I, II and VII of the periodic table such as thermal stability, solubility etc... Identify the cations using flame test. Calculate the percentage purity of compound using iodine thiosulphate titration.
	2.5.2	The fundamentals of flame test and the characteristic colors	
	2.5.3	Solubility of group 2 compounds	
	2.5.4	Volumetric Analysis	
22	2.5.5	Thermal stability of the s-block salts and hydroxides	
	2.5.6	Physical properties of halogens and it's associated reactions	
	2.5.7	Iodine/thiosulphate titrations and calculating percentage purities of compounds	
	2.5.8	Reactions of the halogens and the halides and the identification of the halides in solution	
	Assessment		
23	2.6	Kinetics	
	2.6.1	Factors that affect the rate of a reaction	Name the factors effect on rate of a chemical reaction and to explain the effect of catalyst on the rate. Explain the methods of measuring rate
	2.6.2	The techniques of measuring the rate of a reaction	
	2.6.3	Activation energy and catalysts	
		Assessment	
24	2.7	Chemical equilibria	
	2.7.1	Introduction to dynamic equilibrium	Explain the influence of the factors such as temperatute, pressure and catalyst on the revesible reactions
	2.7.2	Factors that can influence equilibrium and how it happens	
	Assessment		
FEBRUARY			
25	2.8	Organic chemistry - alcohols and halogenoalkanes	
	2.8.1	The types of alcohols and their properties	List out the properties of halageno alkanes, and alcohols. Write mechanisms for the reactions of halageno alkanes, and alcohols and explain the methods of laboratory preparation of them.
	2.8.2	Reactions of alcohol with sodium, oxidation of alcohols, combustion of alcohols and their extraction	
	2.8.3	Halogenoalkanes and their uses	
	2.8.4	Problems of CFCs to society and the alternate solutions for CFCs	

	2.8.5	Reactions of halogenoalkanes	Explain the environmental effects of halogeno alkanes.	
	2.8.6	Preparation of halogenoalkanes		
		Assessment		
26	2.9	Mechanisms	Write mechanisms for the reactions and identify the different types of reaction mechanisms. Explain the chemistry of Ozone layer	
	2.9.1	Classification of mechanisms		
	2.9.2	Electrophilic and nucleophilic substitution reaction mechanisms		
	2.9.3	Chemistry in the ozone layer		
		Assessment		
27	2.10	Mass spectra and IR absorption	Identify molecules and functional groups using different analytical methods and techniques.	
	2.10.1	The mass spectrometer and its applications		
	2.10.2	Interpreting the mass spectrums		
	2.10.3	Infrared spectroscopy and its applications		
	2.10.4	Interpreting the IR spectrums		
28		Assessment	Analyze and assess the environmental pollution caused by anthropogenic and non-anthropogenic activities of the modern-day society. Explain the responsibility of the modern-day man to reduce the effect on the environment.	
	2.11	Green Chemistry		
	2.11.1	Global warming and its effects		
	2.11.2	Greenhouse gases and greenhouse effect		
	2.11.3	Carbon neutrality, carbon footprint & carbon offsetting		
		Assessment		
29	Revision & past papers			
	MARCH			
30	Revision & past papers			
31	Revision & past papers			
32	Mock Examination			
33	Mock Examination			
	APRIL			
34	Distribution of answer scripts and PTI			
35	New Year vacation			