

Content Mastery (Last exams in Nov 2024) - Road to IB exams

1	Mole Concept -Limiting Reagents - Excess calculations	Ideal Gas -Graphs -Formula	Percentage Formulas (Yield, Mass & Purity)	Back Titrations Redox Acid & Base	Empirical Formula -Percentage -Combustion	Uncertainties (Topic 11 but tested with Topic 1) Absolute, Relative & Percentage uncertainties		
2/12	Emission Energy Level Emission Spectrum	% Abundance	Orbitals & Electronic Config	Convergence Limit	Energy Calculations - $E = h \lambda$ $c = \nu \lambda$	Successive Ionisation Energies Large & Small increases in IE		
3/13	Trends Atomic & Ionic Radius M.Point, I.E, E.A	Period 3 Oxides -Equations	Displacement Reactions Grp 1 Metal Combustion Grp 1 Metal Oxide	Transition Metals Definitions Properties (M.P, B.P, I.E, Catalyst)	Ligands -Monodentate & Polydentate Colours	Cis/Trans Complexes	High Spin Low Spin Paramagnetic / Diamagnetic	
4/14	Structure & Bonding Ionic/Covalent/ Metallic	IMFs LDF, Dipole-Dipole H-bonds	ED & Angles (VSEPR) -2ED,3ED,4ED -5ED, 6ED	Resonance -list of compounds -Bond Order, Length	Ozone Depletion Bond Order of O ₃ Radical Reaction	Formal Charge Central Atom FC differences & Electro(-ve)	Hybridisation - sigma / pi bonds - sp, sp ² & sp ³	
5/15	Exothermic/Endothermic Stability Bond Breaking V.S Formation	Calorimetric Experiment - $Q = mc\Delta T$ - $\Delta H = Q/n$	Extrapolation -Temp Vs time -Thermo-titration	Bond Enthalpy Hess's Law (Formation/Combustion)	Definitions -Atomisation -I.E, E.A	Lattice Enthalpy, Hydration Solution -SOLEH	Entropy Change in Entropy	Gibbs Energy Equations with ΔG Signs of $\Delta S + \Delta H$
6/16	Definitions & Factors Energy Profile Diagram	Graphs for Initial Rate	Maxwell Boltzmann -Catalyst -Temperature	Graphical changes & Experimental Methods	Rate Equations Rate Constant & Units	Order of reaction Graphs	Activation Energy & Arrhenius	
7/17	Definitions & Properties of equilibrium	Graphs	Kc expression Qc expression Qc vs Kc	LCP Principles And all factors	LCP Graphs	ICE table calculate Kc ICE table to calculate [A] at eqm		ΔG & ln Kc - Equation
8/18	Definitions of BL Amphiprotic Strong Vs Weak Acid	Acid + Base Reactions & Equations	pH Scale & Formula Dissociation of water	Acid Deposition Equations	Lewis Theory Cation Hydrolysis	K_a,K_b & K_w Weak acid & base formula	pH graphs - 8 forms - 4 points on graph	Buffers - Acidic & Basic - Indicators
9/19	Definitions of redox Common oxidation numbers	Redox Half Eqns & Balancing	Winkler's Method Biochemical Oxygen Demand	Voltaic Cells (Draw components) Cell Notation, Cell Potential & Set-up $\Delta G = -nF E_{cell}$		Electrolytic Cell (Draw components) Calculations: $Q = It$, $Q = nF$ Predicting the products of electrolysis Molten, concentrated & aqueous Factors affecting mass of electrolysed products		
10/20	Homologous Series Functional Group Names Pri, Sec, Tertiary – Alcohols & Amines	Structural Isomers -Chain, Positional, Functional Grp	Free Radical Sub Esterification Alcohol Oxidation (Primary & Secondary)	Stereoisomers Configurational Conformational	Arrow Pushing (Curly Arrow) - Mechanism Electrophilic Addition & Substitution Nucleophilic Sub (S _N 1, S _N 2) Energy Profile Diagrams & Links to Order of reaction			Reduction Aldehyde, Ketone & Acids Nitrobenzene
11/21	Index of Hydrogen Deficiency (IHD) - Formula & Structure	IR Spectroscopy -strong broad -wavenumbers	Mass Spectroscopy - positive ions only -molecular ion	NMR Spectroscopy Hydrogen environments & Integration Trace Splitting Pattern				X-ray Crystallography Bond length Bond Angle