Chemistry Portions for First Term Examination – Jan, 2021

Year 9 – Year 13

Year 9

SC1-States of matter

SC1a -States of matter

SC2-Methods of separating and purifying substances

SC2a – Mixtures

SC2b – Filtration and crystallization

SC2c – Paper chromatography

SC2d – Distillation

SC2e – Drinking water

SC3-Atomic Structure

SC3a – Structure of atom

SC3b – Atomic number and mass number

SC3c - Isotopes

SC4-The Periodic Table

SC4a –Elements and the periodic table

SC4b- Atomic number and the periodic table

SC4c- Electronic configurations and periodic table

Year 10

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SC4b- Atomic number and the periodic table

SC4c- Electronic configurations and periodic table

SC5-Ionic Bonding

SC5a – Ionic bonds

SC5b – Ionic lattices

SC5c- Properties of ionic compounds

SC6-Covalent Bonding

SC6a – Covalent bonds

SC7-Types of Substance

SC7a – Molecular compounds

SC7b- Allotropes of carbon

SC7c – Properties of metals

SC7d – Bonding models

SC8-Acids and alkalis

SC8a – Acids, alkalis and indicators

SC8b – Looking at acids

SC8c – Bases and salts

SC8d – Alkalis and balancing equations

SC8e – Alkalis and neutralization

SC8f – Reactions of acids with metals and carbonates

SC8g - Solubility

SC9 – Calculations Involving Masses

SC9a-Masses and empirical formulae

SC9b-Conservation of mass

SC9c - Moles

Year 11 (GCSE)

Paper 1

SC1-States of matter

SC1a -States of matter

SC2-Methods of separating and purifying substances

SC2a – Mixtures

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SC8e – Alkalis and neutralization

SC8f – Reactions of acids with metals and carbonates

SC8g - Solubility

SC9 – Calculations involving masses

SC9a-Masses and empirical formulae

SC9b-Conservation of mass

SC9c – Moles

SC10 – Electrolytic Processes

SC10a - Electrolysis

SC10b – Products from electrolysis

SC11 – **Obtaining and using metals**

SC11a – Reactivity

SC11b – Ores

SC11c – Oxidation and reduction

SC11d – Life cycle Assessment and recycling

SC12 – Reversible reactions and Equilibria

SC12a – Dynamic equilibrium

SC13 – Transition metals , Alloys and Corrosion

SC13a – Transition metals

SC13b – Corrosion

SC13c – Electroplating

SC13d – Alloying

SC13e – Uses of metals and their alloys

SC14 – Quantitative Analysis

SC14a – Yields

SC14b –Atom economy

SC14c – Concentrations

SC14d – Titrations and calculations

SC14e – Molar volume of gases

SC15 – Dynamic equilibria

SC15a – Fertilisers and the Haber process

SC15b – Factors affecting equilibrium

SC16 a – Chemical cells and Fuel cells

Paper 2

SC3-Atomic structure

SC3a – Structure of atom

SC3b – Atomic number and mass number

SC3c - Isotopes

SC4-The periodic table

SC4 a –Elements and the periodic table

SC4b- Atomic number and the periodic table

SC4c- Electronic configurations and periodic table

SC5-Ionic Bonding

SC5a – Ionic bonds

SC5b – Ionic lattices

SC5c- Properties of ionic compounds

SC6-Covalent Bonding

SC6a – Covalent bonds

SC7-Types of Substance

SC7a – Molecular compounds

SC7b- Allotropes of carbon

SC7c – Properties of metals

SC7d – Bonding models

SC9 – Calculations involving masses

SC9a-Masses and empirical formulae

SC9b-Conservation of mass

SC9c – Moles

SC17- Groups in the periodic Table

SC17a – Group 1

SC17b – Group 7

SC17c – Halogen reactivity

SC17d –Group 0

SC18 – Rates

SC18a – Rates of reaction

SC18b- Factors affecting reaction rates

SC18c – Catalysts and activation energy

SC19 – Heat energy changes in chemical reactions

SC19a – Exothermic and endothermic reactions

SC19b – Energy changes in reactions

SC21 – Earth and Atmospheric science

SC21a – The early atmosphere

SC21b – The changing atmosphere

SC21c – The atmosphere today

SC21d – Climate change

SC25 – Qualitative Analysis

SC25a – Flame tests and photometry

SC25b – Tests for positive ions

SC25c- Tests for negative ions

SC26 – Bulk and surface properties of matter

SC26a – Choosing materials

SC26b- Composite materials

SC26c – Nanoparticles

Year 11 (IGCSE)

Paper 1

UNIT1: PRINCIPLES OF CHEMISTRY

1. States of matter

2. Elements, compounds and mixtures

3. Atomic structure

4. The Periodic Table

5. Chemical formulae, equations and calculations – Part 1

7. Ionic bonding

8. Covalent bonding

UNIT 2 : INORGANIC CHEMISTRY

11. The alkali metals

12. The halogens

13. Gases in the atmosphere

14. Reactivity series

16. Acids, alkalis and titrations

17. Acids, bases and salt preparations

18. Chemical tests

UNIT 3: PHYSICAL CHEMISTRY

19. Energetics

20. Rates of reaction

21. Reversible reactions and equilibria

Paper 2

All the topics of Paper 1 are included in Paper 2, along with the following objectives

UNIT 1: PRINCIPLES OF CHEMISTRY

1. States of Matter

Including

1.5C know what is meant by the term solubility in the units g per 100 g of solvent

1.6C understand how to plot and interpret solubility curves

2. Elements, compounds and mixtures

3. Atomic structure

4. The Periodic Table

5. Chemical formulae, equations and calculations – Part 1

6. Chemical formulae, equations and calculations – Part 2

7. Ionic bonding

8. Covalent bonding

9. Metallic bonding

10. Electrolysis

UNIT 2: INORGANIC CHEMISTRY

11. The alkali metals

Including

2.4C explain the trend in reactivity in Group 1 in terms of electronic configurations

12. The halogens

Including

2.8C explain the trend in reactivity in Group 7 in terms of electronic configurations

13. Gases in the atmosphere

14. Reactivity series

15. Extraction and uses of metals

16. Acids, alkalis and titrations

Including

2.33C describe how to carry out an acid-alkali titration

17. Acids, bases and salt preparations

Including

2.40C describe an experiment to prepare a pure, dry sample of a soluble salt, starting from an acid and alkali

2.41C describe an experiment to prepare a pure, dry sample of an insoluble salt, starting from two soluble reactants

18. Chemical tests

UNIT 3: PHYSICAL CHEMISTRY

19. Energetics

Inlcuding

3.5C draw and explain energy level diagrams to represent exothermic and endothermic reactions

3.6C know that bond-breaking is an endothermic process and that bond-making is an exothermic process

3.7C use bond energies to calculate the enthalpy change during a chemical reaction

20. Rates of reaction

Including

3.14C draw and explain reaction profile diagrams showing ΔH and activation energy

21. Reversible reactions and equilibria

Including

3.19C know that a reversible reaction can reach dynamic equilibrium in a sealed container

3.20C know that the characteristics of a reaction at dynamic equilibrium are:

• the forward and reverse reactions occur at the same rate

• the concentrations of reactants and products remain constant.

3.21C understand why a catalyst does not affect the position of equilibrium in a reversible reaction

3.22C know the effect of changing either temperature or pressure on the position of equilibrium in a reversible reaction:

• an increase (or decrease) in temperature shifts the position of equilibrium in the direction of the endothermic (or exothermic) reaction

• an increase (or decrease) in pressure shifts the position of equilibrium in the direction that produces fewer (or more) moles of gas

Year 12

TOPIC 1 - Atomic structure and the Periodic Table

1.1 Atomic structure

1.2 The Periodic Table

TOPIC 2 - Chemical Bonding and structure

2.1 Giant Structures

2.2 Discrete Molecules

2.3 Physical properties related to structure and bonding.

TOPIC 3 - Redox Reactions

3.1 – Oxidation and reduction in terms of electrons

3.2 – oxidizing agents and reducing agents

TOPIC 4- Inorganic chemistry and the periodic table

4.1 – Group 2

4.2 – Group 7

TOPIC 8- Chemical Energetics

8.1- Heat energy and Enthalpy

8.2 Bond Enthalpy

Year 13

Paper 1

TOPIC 1-Atomic structure and the periodic table

1.1 Atomic structure

1.2 The Periodic Table

TOPIC 2-Chemical bonding and structure

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TOPIC 3-Redox reactions

3.1 – Oxidation and reduction in terms of electrons

3.2 – oxidizing agents and reducing agents

TOPIC 4-Inorganic chemistry and the periodic table

4.1 – Group 2

4.2 – Group 7

TOPIC 5-Formulae, equations and amounts of substance

5.1 – Empirical and molecular formula

5.2 – Amount of substance

5.3 – Equations and calculations

5.4 – Errors and uncertainties

5.5 – Yield and atom economy

5.6 – Types of reaction

TOPIC 6-Organic chemistry

6.1 – Introduction to organic chemistry

6.2 – Hydrocarbons

6.3 – Halogenoalkanes

6.4 - Alcohols

TOPIC 7-Modern analytical techniques

7.1 – Mass spectrometry

7.2 – Infrared spectroscopy

TOPIC 8-Chemical energetics

8.1- Heat energy and Enthalpy

8.2 Bond Enthalpy

TOPIC 9-Reaction kinetics

9.1 – Reaction rate

TOPIC 10-Chemical equilibrium

10.1 – Reversible reactions and dynamic equilibrium

10.2 – Equilibrium position

Paper 2

TOPIC 11 - Further equilibrium

11.1 – Chemical equilibrium

TOPIC 12 - Acid - base equilibria

12.1 – Strong and weak acids

12.2- Acid – Base titrations

TOPIC 14 - Further Redox

14.1 – Standard electrode potential

14.2 – Redox in action

TOPIC 15 – Transition metals

15.1 – Principles of transition metal chemistry

15.2 – Transition metal reactions

15.3 – Transition metal catalysts

TOPIC 16 - Further Kinetics

16.1 – Further kinetics

TOPIC 17 - Further organic chemistry

17.1 Chirality

17.2 Carbonyl compounds

17.3 Carboxylic acids