Disc 1 - Chemical substances

Section A - Chemical substances

Topic	Lesson Name
What will Chemistry classes be about?	1. Discovering the world of chemistry 2. Young chemists: remember! 3. Working in the lab 4. The school chemistry lab 5. Heating substances 6. Verifying the smell 7. Filtering 8. Evaporation of liquids 9. The importance of chemistry
The chemical substances around us	1. The physical properties of substances 2. The state of aggregation and colours of substances 3. Water solubility 4. The magnetic properties of substances 5. The boiling point of alcohol and water 6. The classification of chemical substances
Metals	1. Getting to know the properties of metals 2. The state of aggregation and colours 3. The hardness of metals 4. The malleability of metals 5. The melting point 6. Heat conduction 7. Electrical conduction 8. The position of metals in the periodic system
Metallic alloys	1. Metallic alloys 2. Steel 3. Bronze and brass 4. Duralumin 5. The alloys of gold 6. The properties of alloys
Getting to know non-metals	1. Non-metals 2. The state of aggregation and colours 3. Water solubility of non-metals 4. Investigating the electrical conduction of non-metals

Section B - Mixtures and Chemical Compounds

Mixtures of substances	1. Mixtures 2. Heterogeneous mixtures 3. Homogeneous mixtures 4. Chromatography 5. The classification of matter
A physical phenomenon vs. a chemical change	1. Physical phenomena 2. Melting and burning paraffin wax 3. The properties of magnesium 4. Heating a mixture of sulphur and iron 5. What is the difference between a mixture and a chemical compound?
What is air?	1. Air 2. The composition of air 3. Condensation of air
The discovery of oxygen	1. The identification of oxygen 2. Analysis: the reaction of decomposition
How do oxides originate?	1. Production of oxygen 2. Burning 3. Oxidation

EduROM - Chemistry Topic and Lesson List

Disc 1 - Chemical substances

Section C - The participation of constituents of air in chemical reactions

Topic	Lesson Name
Carbon dioxide - a component of air	1. Where CO_2 is found 2. Detecting carbon dioxide 3. The circulation of carbon dioxide in nature 4. Production of carbon dioxide 5. The properties of carbon dioxide 6. The uses of carbon dioxide
Hydrogen: the lightest gas	1. Where hydrogen is found 2. Production of hydrogen 3. The properties of hydrogen 4. Burning hydrogen in air 5. The reduction of copper oxide with hydrogen 6. The uses of hydrogen 7. Chemical reaction types
Steam: a component of air	1. The evidence for the presence of steam in air 2. Detecting steam in air 3. Absorption of steam by sodium hydroxide 4. Investigating the chemical composition of water 5. The break-down of water using electricity
Air pollution	1. Harmful substances in the air 2. Investigating dust in the air 3. Exhaust fumes 4. The influence of sulphur dioxide on plants 5. Nature conservation

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Disc 2 - The atom and the molecule

Section A - Getting to know the structure of the atom

Topic	Lesson Name
What is the structure of matter?	1. The granular nature of matter 2. Gas diffusion 3. Liquid diffusion 4. Diffusion of solids and liquids
The atom: the smallest unit of an element	1. The oldest definition of the atom 2. The atom-molecule theory 3. The structure of the atom 4. The masses and diameters of atoms 5. The atomic mass unit 6. The atomic mass
How is an atom structured?	1. The internal structure of an atom 2. The properties of elementary molecules 3. Atomic number 4. Atomic mass 5. The electronic shells 6. The configuration of electrons and valence electrons
What are isotopes?	1. Isotopes 2. Hydrogen isotopes 3. Stableisotopes 4. Atomic mass
Radioactivity	1. Radioactiveisotopes 2. Alpha particles 3. Beta particles and gamma rays 4. The properties of alpha, beta and gamma rays 5. The types of radioactivity 6. The uses of radioactive substances 7. The effects of radioactivity

Section B - What can we find out from the periodic table of elements?

The periodic table of elements	1. Mendeleyev'stable 2. The structure of the periodic table: groups 3. The structure of the periodic table: periods 4. The classification of elements
The symbols for elements and	1. Chemical Formulae 2. The symbols for elements 3. The helpful periodic table 4. Single atoms 5. Molecules of elements 6. Polyatomic molecules of elements 7. Molecules of chemical compounds 8. Chemical formulae 9. Modelling
How are molecules built from atoms?	1. Diatomicmolecules 2. The covalent bond 3. The polar covalent bond 4. The ionic bond
Molecular and structural formulae	1. Valence 2. Molecular and structural formulae 3. Determining the molecular formula 4. The valence of copper 5. The valence of sulphur

EduROM - Chemistry Topic and Lesson List

Disc 2 - The atom and the molecule

Section C - Stoichiometric relations in chemical reactions

Topic	Lesson Name
Chemical equations	1. Chemical equations 2. The reaction of sulphur with oxygen 3. Stoichiometricfactors 4. The reaction of copper with sulphur 5. The decomposition of mercury (II) oxide 6. The electrolysis of water 7. The decomposition of a molecule of water 8. The reaction of magnesium with steam 9. The reaction of copper (II) oxide with carbon
The law of conservation of mass	1. The number of atoms in a chemical reaction 2. The mass of the reacting substances 3. The law of conservation of mass
The law of constant composition	1. Is the composition of a compound constant? 2. The mass ratio of the reacting substances 3. The law of constant composition
Stoichiometric calculations based on chemicalcalculations	1. Calculations based on chemical equations 2. Stoichiometric proportions 3. Quantity of chemical reagents

Disc 3 - Aqueous Solutions	
Section A - Water: a compound of hydrogen and oxygen	
Topic	Lesson Name
Water and its role in nature	1. Where water is found 2. Steam in air 3. Is there water in rice? 4. The water cycle in nature 5. The physical states of water 6. Changes of state of water 7. Natural water
Pollution of natural waters	1. The importance of water 2. Pollution of water 3. Pollution of water with crude oil 4. Bird feathers in crude oil 5. Removing crude oil pollution 6. Sewage treatment
The structure of a molecule of water	1. The atomic composition of a molecule of water 2. How does water originate? 3. The polarised covalent bond in a molecule of water 4. The polar structure of the molecule 5. The structure of ice 6. Solution of substances in water
Investigating dissolution of substances in water	1. Is water a good solvent? 2. Other solvents 3. Separating two liquids that do not mix 4. Separating substances through decantation 5. Evaporating the solvent 6. Distillation 7. Not all water is H_2O
Colloidal solutions	1. Colloidal solutions in the kitchen and bathroom 2. Colloidal diffusion of a deodorant 3. Preparing a colloidal solution 4. Tyndall's effect 5. Solutions of soaps 6. Solutions of rock salt 7. Gels 8. Gels and sols 9. Separation of mixtures

EduROM - Chemistry Topic and Lesson List

Disc 3 - Aqueous Solutions	
Section B - Solubility and the concentrations of substances in solutions	
Topic	Lesson Name
What factors determine the speed of dissolution?	1. The impact of breaking up substances on the speed of dissolution 2. How does breaking up speed the dissolving? 3. The impact of mixing on the speed of dissolution 4. How does mixing speed dissolution? 5. The impact of temperature on the speed of dissolution 6. How does heat speed dissolution? 7. Dissolution in petrol
Solubility of substances	1. The dissolving of substances 2. Saturated and unsaturated solutions 3. Solubility 4. Solubility curves 5. Solubility of liquids and gases
Production of crystals: crystallisation	1. Crystallisation 2. Is it possible to "breed" crystals? 3. Hydrated crystals 4. Removing water from a crystal
The concentration of a solution	1. The concept of the concentration of solutions 2. Models of solutions of different concentrations 3. The concentration of a solution and its colour 4. The concentration of a solution 5. The percentage concentration of a solution 6. Solutions used in everyday life 7. Preparing a solution of a given concentration

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Disc 4 - Acids and hydroxides

Section A - Oxygen acids

Topic	Lesson Name
Do non-metallic oxides react with water?	1. Production of sulphuric acid 2. Structure of sulphuric acid molecule 3. Indicators 4. The properties of sulphuric acid 5. Decomposition of sulphuric acid
Carbonic acid - H2CO3	1. Preparation of carbonic acid 2. Structure of a carbonic acid molecule 3. Decomposition of carbonic acid 4. Acids around you
Sulphuric acid - H2SO4	1. Structure of sulphuric acid 2. Preparation of sulphuric acid 3. Properties of sulphuric acid 4. Destructive action of sulphuric acid 5. Dilution of sulphuric acid 6. Colour of indicators in a solution of sulphuric acid 7. Applications of sulphuric acid
Phosphoric acid - H3PO4	1. Preparation of phosphoric acid 2. Structure of phosphoric acid 3. Colour of indicators in a solution of phosphoric acid 4. Decomposition of phosphoric acid 5. Applications of phosphoric acid
Nitric acid - HNO3	1. Structure of nitric acid 2. Preparation of nitric acid 3. Properties of nitric acid 4. Reactions of nitric acid 5. Colour of indicators in a solution of nitric acid 6. Applications of nitric acid

Section B - Binary acids

Do all acids contain oxygen?	1. Structure of hydrogen chloride 2. Preparation of hydrogen chloride 3. Preparation of hydrochloric acid 4. Properties of hydrochloric acid 5. Colours of indicators in hydrochloric acid 6. Reaction of hydrochloric acid with metals 7. Importance of hydrochloric acid 8. Hydrasulphuric acid 9. Preparation of hydrogen sulphide
Structure and division of acids	1. Molecules of chief acids 2. Oxygen acids and binary acids 3. Structure of acids
Why do aqueous solutions of acid conduct electricity?	1. Electrical conduction in acids 2. Electrolytes and non-electrolytes 3. Break-up of hydrogen chlorine into ions in water 4. Division of ions 5. Strong & weak electrolytes
Electrolytic dissociation of acids	1. The theory of dissociation 2. Nitric acid 3. Sulphuric acid and sulphuric acid 4. Carbonic acid and phosphoric acid 5. Electrolytic dissociation of acids
Acid rain and its environmental impact	1. Sources of air pollution 2. Effect of sulphur oxide on plants 3. Nitrogen oxides in the atmosphere 4. Effect of nitric oxide on plants 5. Acid rain

EduROM - Chemistry Topic and Lesson List

Disc 4 - Acids and hydroxides

Section C - Hydroxides

Topic	Lesson Name
Do metallic oxides react with water?	1. Action of water on metallic oxides 2. Phenolphthalein 3. Structure of calcium hydroxide 4. Structure of magnesium hydroxide 5. Decomposition of calcium and magnesium hydroxide 6. Applications of calcium hydroxide Ca(OH)2 7. Applications of magnesium hydroxide Mg(OH)2
Properties of hydroxides	1. Structure of sodium and potassium hydroxides 2. Properties of sodium and potassium hydroxides 3. Colours of indicators in hydroxide solutions 4. Applications of sodium hydroxide 5. Applications of potassium hydroxide 6. Detection of sodium hydroxide
Methods of hydroxide preparation	1. Preparation of sodium and potassium hydroxides 2. Preparation of calcium hydroxide 3. Names of hydroxides 4. From an element to a compound
Electrolyticdissociation of hydroxides	1. Electrical conductivity of hydroxides 2. Electrolytic dissociation of sodium hydroxide 3. Potassium hydroxide 4. Calcium hydroxide 5. Chemical bonds found in hydroxide molecules 6. Dissociation of alkalis
Colours of indicators in solutions of acids bases	1. Reaction of solutions 2. Determination of solution reactions 3. Neutralisation of an acid by a base

Disc 5 - Salts

Section A - Preparation of salts

Topic	Lesson Name
How can salt be obtained?	1. Examples of salts 2. Preparation of salts 3. Reactions of metals with an acid 4. Reactivity of metals 5. Classification of chemical substances
How are the names of salts formed?	1. Salt in everyday life 2. Common and systematic names of salts 3. Formulae of salts
Electrolytic dissociation of salts	1. Electrical conductivity in aqueous solutions of salts 2. Solubility of salt crystals in water
Neutralisation reactions as a method of salt preparation	1. Preparation of sodium chloride 2. Neutralisation reactions 3. Reaction of potassium hydroxide with sulphuric acid 4. Preparation of various salts 5. Finding the stoichiometric coefficients
Preparation of salts in reaction of metal oxides with acids	1. Reactions of metal oxides with hydrochloric acid 2. Reactions of metal oxides with sulphuric acid 3. Methods of salt production preparation
Various methods of salt preparation	1. Action of chlorine in metals 2. Reactions of metals with sulphur 3. Reactions of metallic oxides with non-metal oxides 4. Calcium carbonate precipitation

Section B - Properties of salt

Salts with high and low solubility in water	1. Solubility of salts in water 2. Solubility table 3. Preparation of insoluble salts 4. Preparation of salt precipitates
Reactions of salts	1. Reactions of salts with acids 2. Reactions of salts with bases 3. Reactions of metals with salts
Salts around us	1. Applications of chlorides 2. Solubility of chlorides 3. Nitrates 4. Artificial fertilisers 5. Sulphates 6. Salts in our surroundings 7. Classification of chemical substances

EduROM - Chemistry Topic and Lesson List

Disc 6 - Mineral materials

Section A - Limestone rocks

Topic	Lesson Name
Limestone rocks as a raw material	1. Mineral raw materials 2. Limestone rocks 3. Limestone 4. Applications of limestone 5. Chalk 6. Marble 7. Properties of limestone rocks 8. Identification of limestone
Preparation and application of burnt lime	1. Thermal decomposition of limestone 2. Burnt lime 3. Applications of slaked lime 4. Slaked lime
Why does mortar harden?	1. Mortar 2. Factors influencing the setting rate of mortar 3. Detection of calcium carbonate in plaster 4. Cement 5. Concrete
Gypsum rocks	1. Calcium sulphate 2. Properties of gypsum 3. Calcined gypsum 4. Properties of calcined gypsum 5. Applications of calcined gypsum

Section B - Earth's crust resources

Silicon oxide and its forms	1. Occurrence of silicon oxide in nature 2. Applications of quartz 3. Flint 4. Properties of silica - silicon dioxide 5. Water glass 6. Reactions of silicon oxide 7. Silicon
What is glass?	1. Glass 2. Preparation of glass 3. Forming glass products 4. Structure of glass 5. Properties of glass 6. Types of applications of glass
Soil and its properties	1. Spheres of the Earth 2. Chemical composition of the Earth's crust 3. Soil 4. Composition of soil 5. Properties of soil - absorbing power 6. Properties of soil - Sorption 7. Reaction of soil
Occurrence and preparation of metals	1. Occurrence of metals 2. Extracting of metals from ores 3. Iron blast furnace 4. Steel 5. Electrolysis 6. Metals reclamation

Disc 6 - Mineral materials	
Section C - Mineral materials	
Topic	Lesson Name
Coal	1. Fossil fuels 2. Coals 3. Formation of coals 4. Brown coal and peat 5. Coal carbonisation 6. Gas liquor 7. Cooking plant 8. Applications of coal
Petroleum and its properties	1. Formation of petroleum 2. The occurrence of petroleum 3. The properties of petroleum 4. Distillation of petroleum 5. Applications of petroleum
Seeking sources of energy	1. Fuels 2. Environmental protection 3. Atomic energy 4. Renewable sources of energy 5. Solar energy 6. Biogas 7. Wind energy 8. Water power stations and water mills

Disc 7 - Carbon and its compounds	
Topic	Lesson Name
Occurrence of carbon in nature	1. Occurrence of carbon 2. Types of coal 3. Carbon in nature 4. Organic compounds 5. Effect of temperature on organic compounds
Carbon as an element	1. Forms of carbon 2. Testing the electrical conductivity of diamond and graphite 3. Structure of diamond and graphite 4. Fullerenes 5. Carbon black 6. Uses of diamond and graphite
Compounds of carbon and hydrogen	1. Methane 2. Preparation of methane 3. Explosive mixture 4. Properties of methane 5. Chemical reactions of methane 6. Marsh gas 7. Uses of methane
Alkanes - saturated hydrocarbons	1. Ethane 2. Properties of ethane 3. Propane 4. Butane 5. Mixture of propane and butane 6. Saturated hydrocarbons 7. Condensed structural formulae
Homologous series of hydrocarbons	1. Homologous series 2. General formula of saturated hydrocarbons 3. Properties of hydrocarbons 4. Liquid hydrocarbons 5. Incomplete combustion of hydrocarbons 6. Water solubility of hydrocarbons
Ethene - an unsaturated hydrocarbon	1. Structure of ethene 2. Properties of ethene 3. Addition reaction 4. Homologous series of alkenes 5. Uses of ethene
Polyethylene and other plastics	1. Polyethylene 2. Preparation of polyethylene 3. Polymerisation reaction 4. Properties of polyethylene
Ethyne and its properties	1. Structure of ethyne 2. Preparation of ethyne 3. Flammability of ethyne 4. Reactions of ethyne 5. Identification reaction 6. Hydrogenation reaction 7. Homologous series of alkynes 8. Classification of hydrocarbons 9. Uses of ethyne
Natural sources of hydrocarbons	1. Sources of hydrocarbons 2. Petroleum 3. Cracking

Disc 8 - Hydrocarbon derivatives

Topic	Lesson Name
Alcohols as hydrocarbon derivatives	1. Alcohols 2. Methanol 3. Preparation and uses of methanol 4. Ethanol 5. Preparation of ethanol 6. Uses of ethanol 7. Structure of alcohols
Methanol and ethanol - examples of alcohols	1. Properties of alcohols 2. Volume contraction 3. Reaction of alcohols 4. Combustion of alcohols 5. Effect of ethanol on protein 6. Alcoholism
Other alcohols	1. Monohydric alcohols 2. Polyhydric alcohols 3. 1,2,3-propanetriol(glycerol) 4. Properties of 1,2,3-propanetriol(glycerol) 5. Distinguishing 1,2,3-propanetriol(glycerol) from other alcohols 6. Uses of 1,2,3-propanetriol(glycerol) 7. Classification of alcohols
Occurrence and structure of some carboxylic acids	1. Ethanoic acid 2. Acetic fermentation 3. Structure of ethanoic acid 4. Uses of ethanoic acid 5. Methanoic acid 6. Structure of methanoic acid 7. Uses of methanoic acid 8. Butanoic acid 9. Comparison of carboxylic acid formulae
Electrolytic dissociation of carboxylic acids	1. Reaction of carboxylic acids 2. Dissociation of carboxylic acids
Discovering the properties of methanoic acid and ethanoic acid	1. Properties of methanoic acid and ethanoic acid 2. Reactions of methanoic acid and ethanoic acid 3. Names of salts of carboxylic acids 4. Reaction of carboxylic acids with metals 5. Flammability of carboxylic acids
Long-chain carboxylic acids	1. Higher carboxylic acids 2. Palmitic acid 3. Stearic acid 4. Oleic acid 5. Properties of higher carboxylic acids 6. Flammability of higher carboxylic acids 7. Reactions of higher carboxylic acids
Soaps and detergents	1. Dirt and its removal 2. Structure of soap molecules 3. Removal of dirt 4. Soluble and insoluble soaps 5. Hard water 6. Detergents 7. Threat for the environment
What is the product of the reaction between acids and alcohols	1. Do carboxylic acids react with alcohols? 2. Esterification reaction 3. Properties of ethyl ethanoate 4. Preparation of esters 5. Uses of esters

Disc 9 - Chemical compounds in food and everyday life

Topic	Lesson Name
Chemical constituents of food	1. Essential nutrients 2. Fats 3. Sugars 4. Proteins 5. Water 6. Mineral salts 7. Vitamins 8. Chemical elements constituting living organisms
Fats and their properties	1. Occurrence and types of fats 2. Classification of fats 3. Structure of fat molecules 4. General formula of fats 5. Properties of fats 6. Oily substances 7. Distinguishing vegetable fats from animal fats 8. Saponification of fats
What is the structure of proteins?	1. Occurrence of proteins 2. Chemical composition of proteins 3. Elements constituting proteins 4. Structure of proteins 5. Peptide bond 6. Amino-acid sequence 7. Various structures of proteins 8. Classifications and importance of proteins
Testing the properties of proteins	1. Physical properties of proteins 2. Properties of proteins 3. Salting out of proteins 4. Denaturation of proteins 5. Identification reactions of proteins
Natural and synthetic fibres	1. Wool and natural silk 2. Properties of wool and natural silk 3. Detection of protein in the fibres of wool and natural silk 4. Properties of protein fibres 5. Effect of bases and acids on wool and silk fibres 6. How to take care of woollen and silk clothing 7. Synthetic fibres
Discovering sugars	1. Occurrence of sugars 2. Structure of glucose 3. Physical properties of glucose 4. Fructose 5. Fermentation of glucose 6. Detection of glucose 7. Photosynthesis 8. Uses of glucose
Sucrose - an example of disaccharide	1. Sucrose - commonly known as sugar 2. Physical properties of sucrose 3. Chemical properties of sucrose 4. Structure of sucrose
Starch - a food store in plants	1. Occurrence of starch 2. Structure of starch 3. Shape of starch granules 4. Properties of starch 5. Detection of starch 6. Hydrolysis of starch 7. Dextrins

Disc 9 - Chemical compounds in food and everyday life	
Topic	Lesson Name
Cellulose	1. Occurrence of cellulose 2. Structure of cellulose 3. Properties of cellulose 4. Combustion of cellulose 5. Hydrolysis of cellulose 6. Uses of cellulose 7. Classification of sugars
Medicinal chemistry	1. Chemical changes in the human body 2. Chemotherapy 3. Correct use of medicines 4. Aspirin 5. Properties of aspirin 6. Vitamin C 7. Antibiotics 8. Insulin 9. Naturalmedicines 10. Drug testing 11. Drug abuse
Nicotine is a poison	1. Occurrence and extraction of nicotine 2. Properties of nicotine 3. Cigarettes 4. Nicotinism 5. Examining cigarettes 6. Smoking and health 7. The habit of smoking can be broken
Alcoholism	1. Conversion of ethanol in the human body 2. Oxidation of ethanol 3. Effect of ethanol on the human body 4. Reaction of the human body to ethanol
Drug addiction - a dangerous dependence	1. Drug addiction 2. Drugs 3. LSD 4. Morphine and heroin 5. Hashish and marijuana 6. Cocaine 7. Effects of drug addiction 8. Mental and physical dependence on drugs