Chemistry Grades 8 - 12

Grade 8

Content

Introduction to chemistry and the laboratory , introduction to the concept of particles, material mixtures and pure materials, separating material mixes, significance and characteristics of chemical reactions, elements, symbols as chemical signs, setting up and balancing reaction equations, water as a pure material, components of the air, redox-reaction with oxygen, metals and bonding of metals

Textbook: Elemente Chemie 1, Publisher Klett

Grade 9

Content

Empirical formulas, structure of the atom, nucleus-shell atomic model, formation of ions, ionic bonding and ionic compounds, properties of salts, noble gases, halogens build salts, oxidation-reduction reaction as electron transfer reaction, covalent bonding, polar and nonpolar, secondary bonding, acidic and alkaline solutions, alkaline metals, properties and reactions

Textbook: Elemente Chemie 1, Publisher Klett

Grade 10

Content

Electrolysis, organic chemistry, fossil fuels, hydrocarbon compounds, nomenclature, physical and chemical properties, isomerism, halogenation of hydrocarbon compounds, environmental chemistry (Ozone, global warming), oxygen containing hydrocarbons (alcohols, carbonyl compounds, carboxylic acid), addictive potential of alcohol, condensation reaction, esterification, peptide bonding, proteins and lipids

Textbook: Elemente Chemie 1, Publisher Klett

Grade 11

Content

natural products (proteins, lipids, carbohydrates, nucleic acid), properties, detection reaction, biological importance, tensides, surfactant substances, plastic materials, polymers, structure/property relation, redox reaction, oxidation number, atomic structure of the transition metals of the 4th period, galvanic cell, electrolysis, accumulators, environmental problems, calculation of potential differences in standard conditions, Law of Faraday, corrosion and corrosion protection

Textbook: Chemie Heute SII, Publisher Schroedel

Grade 12

Content

Reaction speed, catalyst, equilibrium reaction, law of mass action, solubility equilibrium, principle of Le Chatelier, significance of ammonia synthesis process and fertilizers, acid base reaction, theory of Brönsted, calculation of pH values (strong and weak acids and bases), buffer solutions.

After the Abitur:

Theory of dyes, tensides and detergents, or: aromatic substances, pharmaceuticals

Textbook: Chemie Heute SII, Publisher Schroedel