

Knowledge required in chemistry

General chemistry

Gas

- States of matter
- Gas laws

Thermodynamics

- 1^o Law
- 2^o and 3^o law
- Partial Molar values
- Phase diagramm
- Raoult's law and Henry's law

Chemical equilibrium

- Equilibrium constant
- Thermodynamic and equilibrium chemistry
- Le Chatelier's principle

Physical properties of solutions

- The enthalpy of dissolution
- Colligative properties

Analytical chemistry

Acids and bases

- Acids and bases according to Brønsted and Lewis
- pH scale
- pK_A and pK_B
- Buffer solutions
- Acid-base titrations

Solubility and complexation

- Solubility product
- pH influence
- Common ion effect
- Solubility and complex ions
- Complex ions in acid-base reactions

Electrochemistry

- Oxydo-reduction
- Electrolysis
- Electromotive force of batteries
- Faraday's law
- Nernst equation
- pH measurement

Basics concepts of kinetics

- Classification of chemical reactions
- Factors that affect reaction rates
- 1st order reaction
- 2nd order reaction
- Determination of the order of a reaction by the initial velocity method
- Arrhenius Law

Organic chemistry

Alkenes :

- Hydrogenation
- Electrophilic additions
- Different types of oxidation

Alkynes :

- Acidity of alkynes
- Reduction
- Electrophilic additions

Aromatic compounds :

- Electrophilic aromatic substitutions

Halogenoalkanes :

- Nucléophilic substitutions
- Eliminations

Alcohols :

- Halogenation
- Dehydratation
- Oxidation

Amines :

- Alkylation
- Hoffmann elimination
- Reaction with carbonyl compounds

Aldehydes and ketones :

- Protection
- Reduction and oxidation
- Alkylation

Carboxylic acids and derivatives:

- Esterification
- Reduction
- Alkylation