Educational requirements for the IB exam

for students choosing the CHEMISTRY HL subject

based on Syllabus for chemistry in pre-IB class in 1349 IB School in Poznań.

1. Systematics of inorganic compounds:

a) Physical and chemical properties of hydrides.

b) Physical and chemical properties of oxides.

c) Physical and chemical properties bases and hydroxides.

d) Physical and chemical properties of acids.

e) Physical and chemical properties of salts.

2. Structure of an atom:

a) Electronic configuration of s, p and d blocks elements and their ions in shell, subshell and electron in boxes notations.

b) Isotopes and their percentage abundance – calculations.

3. Chemical bondings and periodicity.

a) Electronegativity, atomic radius and ionic radius – trends in Periodic Table.

b) Ionic bonding and physical properties of ionic compounds.

c) Covalent and polar covalent bondings.

d) Coordinate bonding.

e) Metallic bonding and physical properties of metals and alloys.

4. Rections in aqueous solutions.

a) Acid, bases and salts in Arrhenius theory – dissotiation reactions.

b) pH of aqueous solutions and the pH scale.

c) Rections in aqueous solutions in molecular, ionic and net ionic equations:

- neutralization reactions,
- reactions acids with salts and bases with salts,
- precipitation reactions,
- hydrolysis of salts.

5. Kinetics and redox reactions.

a) Factors affecting rate of chemical reaction.

b) Oxidation number of elements in inorganic compounds.

c) Readox reactions: oxidation and reduction half equations. Oxidant and reductant in redox processes.

d) Balancing the equations of the redox reactions in electron form.

6. Stoichiometry and concentration of solutions.

a) The mole concept.

b) Stoichiometry of gases in STP conditions.

c) Mole to mass, mass to mass, mole to volume and volume to mass calculations in chemical reactions.

d) Limiting reagent and yield of chemical reaction.

e) Percentage concentration Cp and molar concentration Cm.

f) Recalculation of concentrations (Cp $\rightarrow$Cm, Cm $\rightarrow$Cp)

g) Dilution of percentage and molar concentrations.