

- Write the formula for the following molecules:
  - nitrogen triiodide -
  - diarsenic pentasulfide -
  - carbonic acid -
  - nitrous acid -
- Balance the oxidation-reduction reaction and determine the oxidizing and reducing agent!
 
$$\text{HNO}_3 + \text{Cu}_2\text{O} \longrightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$$
- What factors determine the rate of a chemical reaction?
- Does the salt NaCN give an acidic, basic or neutral solution in H<sub>2</sub>O? Explain your answer.
- Composition of the zinc phosphate cements is:
- Write the rate equation according to Guldberg-Waage for following reaction and give the molecularity and the reaction order
 
$$\text{N}_2 + \text{H}_2 \longrightarrow \text{NH}_3$$
- Write the equation for pH calculation of buffer system composed of NH<sub>4</sub>OH + NH<sub>4</sub>Cl:
- Draw structural formulas for
  - 2-pentene;
  - phenol;
  - oxalic acid,
  - aniline
- Write the IUPAC names and structural formulas of:
  - phthalic acid,
  - neopentylalcohol,
  - succinic acid,
  - benzaldehyde:
- Write an example of the diene with: (a) condensed and (b) conjugated double bonds:
- Define isoelectric point (pI) of amino acids. Which method is utilizing different pI of amino acids for their separation?
- Draw all isomers of cresol:
- Structure of ceramics:
- Write the chemical structure of α-D-galactose by Haworth formula:
- The two chief components of starch are.....Which type of bond contain?
- Name at least 4 examples of heteropolysaccharides:
- Eicosanoids are group of compounds that include ..... They are derivatives of acid with the name and chemical structure:
- Explain what does it mean:
  - EPA and give its structure
  - DHA and give its structure
- Write the structure of acidic amino acids and give them names!
- Write formula of Ser at pH = 3:
- Write all possible dipeptides made of Gly and Ala (add their structure):
- Part of a DNA sequence is A-T-G-C-G-G-C-A-T. What is the complementary sequence in mRNA? Mark hydrogen bond between bases.
- Write the structure of uracil in two tautomeric forms. In which form are they present in nucleic acids?

24. How many grams of water do we need to the dilution of 100 g of 96 % sulfuric acid to get its 20 % solution?
25. Plaster is ..... and used for .....
26. Peptide bond can be detected by.....  
Name reaction and write which color does it give.
27. Alkalimetry and acidimetry are.....and they are depending on reaction .....
28. Write the structure of heterocycle that is a component of vitamin B<sub>2</sub>:
29. Write the structure of cholesterol and give numbers to each carbon!
30. Calculate pH of solution Ca(OH)<sub>2</sub> which concentration  $c = 0,005 \text{ mol/l}$ .