

## Questions and problems to solve and learn

### Exercises No. 7-8

#### Complexometric reactions and titrations

Werner's theory.  
Structures of metal complexes.  
Complexes and formation constants.  
Conditional formation constant.  
Metal-chelate complexes.  
Chemistry and properties of EDTA.  
Detection of the end point: indicators.  
Conditional formation constant.  
EDTA titration techniques.

#### Experiments:

7. Determination of water hardness ( $\text{Ca}^{2+} + \text{Mg}^{2+}$ ). Determination of  $\text{Ca}^{2+}$  and indirect determination of  $\text{Mg}^{2+}$ .
8. Determination of  $\text{Fe}^{3+}$  by EDTA titration using salicylic acid indicator.

#### Recommended References:

1. Analytical Chemistry; G.D. Christian, P.K. (Sandy) Dasgupta, K. A. Schug; John Wiley & Sons, Inc.
2. Modern Analytical Chemistry; D. Harvey; The McGraw-Hill Companies.
3. Quantitative Chemical Analysis; D.C. Harris; W.H. Freeman and Company, NY.
4. Lectures on analytical chemistry:
  - section 3 Basic tools and operations part 1 Volumetric anal.
  - section 10 Complexometric reactions
  - section 11 Complexometric titrations