**ORGANIC CHEMICAL ANALYSIS**

***Organic Analysis Methods***

Organic analysis methods are applied to recognize an organic substance, find its chemical structure, and determine its physical constants. The organic chemist distinguishes, purifies and analyzes reaction products when investigating the synthesis of new organic compounds, the synthesis of organic compounds by the new method (s) or new reactions of organic compounds. Separation and purification skills and experience are gained by working in the laboratory. However, before applying analytical methods for organic analysis, it is necessary to know what purpose to use and to learn to evaluate the results in detail; The application of the methods can be learned in the laboratory and/or when using the analyzer.

**Organic analysis methods,**

(i) Chemical methods

(ii) It can be grouped into two groups as physical methods.

(i) Chemical methods have been developed to indicate functional groups in the structure of organic substances with the help of chemical reactions. The analysis in which chemical methods are applied is often referred to as chemical analysis; Today, it is distinguished from other analysis methods by calling it age analysis.

(ii) Physical methods are chromatographic methods based on the difference in the velocity of organic substances on a phase and electromagnetic methods based on the interaction of organic materials with electromagnetic radiation. Analyzes in which these methods are applied are called chromatographic analysis and spectroscopic analysis, respectively, and they are among the instrumental methods of analysis since they often require the use of a device. Today, chromatographic and spectroscopic analysis are mostly used for organic qualitative analysis. However, for this analysis, there must be devices available to the student and the researcher and / or available for use. Chemical analyses, on the other hand, can be easily carried out with short-term reactions using special reagents designed to indicate functional groups. In the student lab, chemical analysis is often sufficient; Chromatographic and spectroscopic analysis methods are used if necessary and / or possible.

The systematic approach in the application of chemical, chromatographic, and spectroscopic analysis methods for the analysis of mixtures and pure substances is summarized in the following steps.

A systematic approach to the analysis of an organic substance;

1. **Purification and purity control:** Finding physical constants. Preliminary trials and observations. After the components of the mixture are separated, their physical constants are measured. The components are purified; if the physical constants do not change, the substances are pure. As a test of purity, the melting point for solids, the boiling point for liquids, and refractive index are used. The physical condition of the substance, color and odor characteristics are determined. It tries to find burning and pyrolysis products.

(For detailed information on the subject, see experimental organic chemistry book p: 950-952)

2. **Elemental analysis:** Elements in the structure of matter are found and qualitative element analysis is performed. If the substance is considered to be registered in the literature, this information is sufficient. However, if the substance is thought to be new, quantitative element analysis and molecular mass must be found in order to find the molecular formula.

(For detailed information on the subject, see experimental organic chemistry book p: 953-959)

3. **Determination of solubility:** The substance is classified according to its solubility in water and diethyl ether and its reaction to acid and base.

(For detailed information on the subject, see experimental organic chemistry book p: 962-966)

4**. Determination of functional groups:** Chemical or spectroscopic analysis is applied, or one can be applied and the other as a supportive. If the chemical analysis is carried out, small samples of the substance are reacted with special reagents; these reactions are called functional group tests. Functional group tests are performed for the item in accordance with the element analysis results and resolution class, and the functional group class of the substance is determined.

(For detailed information on the subject, see experimental organic chemistry book p: 967-1007)

5. **Literature review:** A literature search is performed for the item considering the physical constants determined in Step 2 and functional groups determined in Step 4, and the most likely item is selected by finding the possible item (s).

6. **Accuracy check:** If a pure sample of the substance can be found, the accuracy of the analysis of the substance is determined by measuring the mixed melting point or by chromatographic analysis and spectroscopic analysis.

(For detailed information on the subject, see experimental organic chemistry book p: 1008-1032)