

Analytical Chemistry and Its Different Types

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Received: July 17, 2021; **Accepted:** July 23, 2021; **Published:** July 31, 2021

Introduction

Analytical Chemistry is a branch of chemistry that studies the chemical composition of materials and also helps to develop the tools required to examine them. It makes use of different analytical methods be them standard or error methods. Practically, these methods are done along with another method that is combined with another method or performed solely. These methods are mainly used to define or determine the numerical amount or concentration of the chemicals.

Analytical chemistry has a different methods used in to continue with the process. They are classical method, wet chemical method, modern method and instrumental methods. The traditional method uses extraction, distillation and precipitation. Identification could even be supported differences in color, odor, melting point, boiling point, solubility, radioactivity or reactivity. These traditional method uses mass or the volume changes to quantify amount. Instrumental method uses chromatography, field flow fractionation to separate the samples. The traditional methods uses similar instruments and may use light and heat interactions along with different magnetic field. Most of the times, an instrument is used to quantify the analyte. This type of chemistry is mostly focused on experimental designs, chemometrics to design the new tools. These are widely used in the fields of science, medicine etc.

A similar type of analytical chemistry is Mass spectrometry which measures the ratio of mass-to-charge ratio of molecules using different magnetic fields. They also use different types of ionization methods to measure the ratio of molecules. Some of these are chemical ionization, laser ionization etc.

Titration is another method of analytical chemistry which is used to analyze whether the molecules have reached the equivalence point or not. This also helps to determine the quantity present in the solution. Mostly, we are pretty much familiar with the titration technique we use in the labs which outputs the change in color of the molecules indicating a color change. There are many other

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Citation: Evon M (2021) Analytical chemistry and its different types. J Org Inorg Chem Vol.7 No.4

sorts of titration techniques used to analyze the nature of the molecules. And these titration techniques use different types of indicators to succeed in some equivalent points.

Gravimetric analysis involves determines the amount of the material present before and after the transformation. Let's discuss it with a known example that is determination of the quantity of water during the heating process to reduce the loss of water.

Quantitative analysis as the name says measures the quantity of chemical constituents present in a substance. Inorganic chemical analysis is nothing but examining technique to verify the presence of aqueous ions or elements in the substance by following a series of reactions. Sometimes small carbon is also used in the process to measure the quantity of chemical constituents. These are not much used for the practical purposes though but used in theoretical or lab or field work as a part of a thesis. These tests help to determine the presence or absence of a specific compound but not the amount. Hence it's clear that these tests are used to determine the quality and not the quantity.

Analytical chemistry has applications or tools that are used in forensic science and other investigation sciences or material science.