



Quantitative Analysis

In chemistry, quantitative analysis is a section of the subject that deals with the quantities of various components in a sample. The quantity can be expressed as a mass, volume, concentration, relative abundance, or any other number of ways. Quantitative analysis is carried out using chemical or physical procedures.

Importance Of Quantitative Analysis *For* a variety of reasons, quantitative analysis of a sample is critical. It specifies how much reactant should be used to perform a chemical synthesis reaction in order to obtain a specific amount of product, reducing chemical waste (increasing atom economy). It can also be used to determine the quality of food or any other product by indicating the presence of appropriate amounts of ingredients, as well as determining the purity of a sample

There are two methods in quantitative analysis which are:

- Chemical methods – Chemical methods include titration methods, gravimetric methods, combustion analysis techniques, and chemical reactions (for example, oxidation, reduction, precipitation, neutralization, and so on).
- Physical methods – Physical methods examine one or more of a sample's physical attributes. AES (Atomic emission spectroscopy), x-ray fluorescence spectroscopy, mass spectroscopy, and other techniques are



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1st term – Lecture 2 (Qualitative and quantitative analytical method and concentrations)



examples. Most of the time, physical and chemical analysis techniques, together with certain computations, are employed to identify the exact amount of a component in a sample. However, several inferences and experimental errors can lead to erroneous final results.

The Similarities Between Qualitative and Quantitative Chemistry Analysis

- In chemistry, both qualitative vs quantitative analysis in chemistry are analytical procedures
- In chemistry, both qualitative and quantitative analysis techniques provide information on the components of a sample
- The majority of the time, these strategies are combined (Ex: use qualitative analysis followed by quantitative analysis)



The differences Between Qualitative and Quantitative Chemistry Analysis

Qualitative Analysis	Quantitative Analysis
<ul style="list-style-type: none">In chemistry, qualitative analysis is a branch of the subject that examines the chemical makeup of a material	<ul style="list-style-type: none">In chemistry, quantitative analysis is a section of the subject that deals with the quantities of various components in a sample
<ul style="list-style-type: none">Qualitative analysis determines the presence or absence of several chemical components in a sample through analytical techniques	<ul style="list-style-type: none">Quantitative analysis determines the amount of various chemical components contained in a sample
<ul style="list-style-type: none">Qualitative analysis employs procedures such as distillation, extraction, color change, chromatography, and so on	<ul style="list-style-type: none">Titration, gravimetric analysis, combustion analysis, AES, and other techniques are used in quantitative analysis in chemistry