# Quantitative Analysis Chemistry Questions with Solutions

**Q1:** _____ chemical analysis is the measurement of how much of a chemical substance is present. _____ chemical analysis is the determination of what is present in a sample.
a) Quantitative; Qualitative
b) Stoichiometric; Qualitative
c) Qualitative; Quantitative
d) Stoichiometric; Identification

**Answer:** a) Quantitative; Qualitative

**Q2:** When extracting a sample with a liquid, the liquid is _____ from the sample.
a) transferred
b) drained
c) effused
d) decanted

**Answer:** d) decanted

**Q3:** _____ is the substance being measured during chemical analysis.
a) Bulk
b) Analyte
c) Sample
d) Lot

**Answer:** b) Analyte

**Q4:** _____ is the series of procedures applied to a sample prior to analysis.
a) Sample preparation
b) Pre-analysis clean up
c) Filler elimination
d) Matrix removal

**Answer:** a) Sample preparation

**Q5:** Which is NOT a general step in the analytical process?
a) Sample Preparation
b) Selecting analytical procedures
c) Make policy
d) Reporting and interpretation

**Answer:** c) Make policy

**Q6:** _____ are repeated measurements to assess the variability in the analysis and to guard against a gross error in the analysis of a single aliquot.
a) Aliquots
b) Replicate measurements
c) Sampling
d) Analysis

**Answer:** b) Replicate measurements

**Q7:** What are the methods of quantitative analysis?

**Answer:**

Quantitative approaches emphasise objective measurements and statistical, analytical, or numerical analysis of data gathered through interviews, questionnaires, and surveys, or by manipulating pre-existing statistical data using computing tools.

**Q8:** What are the advantages of quantitative research?

**Answer:**

Eventually, unbiased, supervised research and analysis back up or refutes the conclusions. To reduce bias, each step in the data collection and analysis process is carefully planned. The fact that tests for a larger population are true, accurate, and generalizable is a major benefit of this method.

**Q9:** If 0.2g of an organic compound containing carbon, hydrogen and oxygen on combustion, yielded 0.147g carbon dioxide and 0.12g water. What will be the content of oxygen in the substance?

**Answer:**

%C = $\frac{12}{44} x \frac{Mass of CO_2}{Mass of compound} x100$

= $\frac{12}{44} x \frac{0.147}{0.2} x100$

**C = 20.04%**

%H = $\frac{2}{18} x \frac{Mass of H_2O}{Mass of compound} x100$

$= \frac{2}{18} x \frac{0.12}{0.2} x 100$

**H = 6.66%**

∴ %O = 100 − (% of C + % of H)

= 100 − (20.04 + 6.66)

= 100 − 26.70

**∴ %O = 73.3%**

**Q10:** Why Quantitative Analysis is important?

**Answer:**

Quantitative analysis is used to quantify nutrient levels and offer an exact accounting of dosage in the manufacture and testing of food and pharmaceuticals.

It's also important for determining the amount of pollutants or impurities in a sample. While qualitative analysis can detect the presence of lead in the paint on a toy, quantitative analysis can detect the amount of concentration present.

For information about a patient's health, medical tests rely on quantitative analysis. Quantitative analytic techniques, for example, can be used to evaluate blood cholesterol levels, lipoprotein ratios in plasma, and the amount of protein discharged in urine. Quantitative analysis complements qualitative analysis in this case because the latter identifies the chemical's type while the former tells you how much of it there is.

Quantitative tests of a mineral can be used to see if mining for a certain element or compound is feasible.

Quantitative testing are performed to ensure that items comply with manufacturer and regulatory requirements.

**Q11:** What is the reagent used in Dumas method?

**Answer:**

The Dumas Method is used to determine whether or not an organic compound contains nitrogen.

When a nitrogen-containing organic compound is heated with excess copper oxide in a $CO_2$ atmosphere, free nitrogen, as well as $CO_2$ and water, is obtained.

$$C + 2CuO \rightarrow CO_2 + 2Cu$$

$$2H + CuO \rightarrow H_2O + Cu$$

**Q12:** In the Carius method of estimation of halogen, 0.15g of an organic compound gave 0.12g of AgBr. What is the percentage of bromine in the compound?

**Answer:**

Mass of Bromine = 80 g/mol

Mass of AgBr = 188 g/mol

Weight of AgBr = 0.12g

Weight of organic compound = 0.15g

$\therefore$ % of Bromine = $\frac{Molar mass of Br}{Molar mass of AgBr} x \frac{Weight of AgBr}{Weight of organic compound} x100$

$= \frac{80}{188} x \frac{0.12}{0.15} x100$

= **34.04%**

**Q13:** Identify the one which does not come under the chemical methods of quantitative analysis?
a) Gravimetric
b) Titrimetric
c) Volumetric
d) Magnetic susceptibility

**Answer:** d) Magnetic susceptibility

Explanation: Magnetic susceptibility is under the category of physical approaches in quantitative analysis, hence is the answer.

**Q14:** Select the inappropriate statement regarding quantitative analysis.
a) It helps in determining the outcome of the product
b) It helps in determining the impurities in the sample

c) It fails to indicate the presence of lead in some compound
d) It could identify the amounts of dosage present in the drug

**Answer:** c) It fails to indicate the presence of lead in some compound

Explanation: It can detect the presence of lead and may be able to interpret its concentration in paints and toys.

**Q15:** Differentiate between qualitative and quantitative analysis.

**Answer:**

The main distinction between qualitative and quantitative chemistry is that qualitative chemistry determines the presence or absence of various chemical components in a sample, whereas quantitative chemistry determines the amount of various chemical components present in a sample.

| | **Qualitative Analysis** | **Quantitative Analysis** |
|---|---|---|
| **Qualitative vs Quantitative Analysis in Chemistry** | In chemistry, qualitative analysis is a branch of the subject that examines the chemical composition of a material. | In chemistry, quantitative analysis is a section of the subject that deals with the quantities of various components in a sample. |
| **Details** | The presence or absence of various chemical components in a sample is determined via qualitative analysis in chemistry. | The amount of different chemical components contained in a given sample is determined via quantitative analysis in chemistry. |
| **Techniques** | In chemistry, qualitative analysis employs procedures such as distillation, extraction, colour change, chromatography, and so on. | Titrations, gravimetric analysis, combustion analysis, AES, and other techniques are all used in quantitative chemistry. |

## Practise Questions on Quantitative Analysis

**Q1:** Quantitative analysis is one which is used for separating out the specific constituents from a mixture.
a) True
b) False

**Answer:** b) False

Explanation: Quantitative analysis is used to determine the quantity (or amount) of something, whereas qualitative analysis is defined by the statement above.

**Q2:** Select the incorrect statement regarding analytical balance.
a) It is the fundamental kit in quantitative analysis
b) It measures samples very accurately
c) It could measure the difference in mass upto 0.1 mg
d) It is not a sensitive instrument

**Answer:** d) It is not a sensitive instrument

Explanation: It is a very sensitive equipment, capable of measuring the weight of a specific substance to within 0.1 mg.

**Q3:** Covalent molecules can be identified using quantitative methods.
a) False
b) True

**Answer:** a) False

Explanation: The qualitative analysis is performed to identify covalent compounds by using physical features like melting point to distinguish them.

**Q4:** Which among the following is not a physical method?
a) X-ray fluorescence spectroscopy
b) Atomic emission spectroscopy
c) Inert gas fusion
d) Trace element analysis

**Answer:** c) Inert gas fusion

Explanation: Because it incorporates chemical reactions like oxidation, inert gas fusion is an example of chemical methods of quantitative analysis.

**Q5:** Identify the test which is not a part of qualitative analysis?
a) Iodine test
b) Kastle-Meyer test
c) Litmus test
d) Flame test

**Answer:** c) Litmus test

Explanation: The Kastle-meyer test is used to identify blood, the Iodine test is used to identify starch, and the Flame test is used to identify Barium.