

What gas is used in a spectrometer



Article Overview

Spectrometers commonly use argon, helium, or hydrogen gases depending on the type and purpose of the instrument.

Optical Spectrometers

In optical or direct-reading spectrometers, argon gas is frequently used to fill the optical chamber before sample excitation. The argon atmosphere displaces air, preventing oxygen and nitrogen from interfering with the atomic spectra generated by the sample. This ensures that the emitted light is not oxidized or altered, allowing the detector to capture accurate elemental spectra and avoid stray peaks or intensity attenuation. The purity of argon is critical, as impurities like oxygen, nitrogen, or moisture can reduce measurement accuracy .

Mass Spectrometers and GC-MS

In gas chromatography-mass spectrometry (GC-MS), gases serve a different role. A carrier gas, typically helium or hydrogen, transports the vaporized sample through the chromatographic column. The gas must be inert and pure to prevent reactions with the sample and to ensure precise separation of compounds. After separation, the mass spectrometer ionizes the molecules, often using an electron ionization source, and detects them based on their mass-to-charge ratio .

Summary

- Argon: Used in optical spectrometers to create an inert atmosphere for accurate spectral measurements .
- Helium or Hydrogen: Used as carrier gases in GC-MS to transport and separate volatile compounds without chemical interference .

Article Content

How do mass spectrometers work?

This can be used to identify the atoms or molecules in the original sample. In early spectrometers, photographic

How Does a Gas Mass Spectrometer Work?

This article looks at the history of mass spectrometry and gas chromatography mass

Spectroscopy 101 - Introduction

Almost everything we know about the make-up, temperature, and motion of planets, stars, and galaxies comes from

Mass spectrometry | Definition, Applications, Principle, & Facts ...

Mass spectrometry, analytic technique by which chemical substances are identified by the sorting of gaseous ions in

How Are Mass Spectrometers Used In Gas Analysis?

How is Mass Spectrometry Used? Real-Time Gas Analysis Real-time gas analysis offers continuous

10: Introduction to Spectroscopy

INTRODUCTION Spectroscopy is the study of the interaction between matter and electromagnetic radiation. The types of

Spectrometers for Elemental Spectrochemical Analysis, Part I: The

Spectrometers for Elemental Spectrochemical Analysis, Part I: The Basic Spectrometer An overview of the

What is Mass Spectrometry and How Does it Work? | Waters

The Mass Spectrometry Primer What is Mass Spectrometry and How Does it Work? Mass spectrometers can be smaller than a coin,

16.1: Mass Spectrometry

An outline of what happens in a mass spectrometer Atoms can be deflected by magnetic fields - provided the atom is first turned into

Spectrometers - Visual Encyclopedia of Chemical Engineering

Spectrometers use light wavelengths to investigate the chemical composition of a sample. Atomic spectrometers use an analytical

Introduction to Mass Spectrometry

There are many types of mass spectrometers and sample introduction techniques which allow a wide range of analyses. This

Gas Spectroscopy

Gas spectroscopy is defined as a technique used to analyze the composition and properties of gases through methods such as

Mass spectrometry

Mass spectrometry Mass spectrometry (MS) is an analytical technique that is used to measure the mass-to-charge ratio of ions. The

Mass Spectrometry: Definition, Principle, and Applications

What is mass spectrometry. What is a mass spectrometer, and how does it work. What are its applications. What detectors are used.

Gas chromatography-mass spectrometry

GC-MS schematic These two components, used together, allow a much finer degree of substance

Mass Spectrometry

What mass spectrometry is, how it works, and what the technique is used for in analytical chemistry and other sciences.

What is a Spectrometer and How Does it Work?

In this article, we will explore what a spectrometer is, how it works, and the different types of spectrometers used in

The Importance of Argon Gas in Spectrometers

Protective Gas in the Optical Chamber: The optical chamber of an argon-filled spectrometer is filled with high-purity

What is Mass Spectrometry? | Broad Institute

Mass spectrometry is an analytical tool useful for measuring the mass-to-charge ratio (m/z) of one or more molecules present in a

Spectroscopy 101 – Types of Spectra and Spectroscopy

As you might have guessed, absorption lines are caused by absorption: When starlight passes through a

Mass Spectrometry Basics

Mass spectrometers use electric and magnetic fields to measure the masses of atoms and molecules. What are mass spectrometers

Spectrometer

There are two classes of radiation sources used in spectrometry: continuum sources and line sources. The former are usually lamps

Background: Introduction to Spectroscopy

Line Emission Instead of using our spectrometer on a light bulb, what if we were to use it to look at a tube of gas - for

Gas chromatography mass spectrometry basic principles | Agilent

It works by heating a liquid sample until it converts into a vapor that can be carried by a gas like helium or hydrogen. The gas (called

How the Mass Spectrometer Works

How a mass spectrometer works If something is moving and you subject it to a sideways force, instead of

How are Mass Spectrometers Used in Gas Analysis?

Real-time gas analysis can simultaneously monitor various gases, including hydrogen, helium, methane, carbon

Mass Spectrometry Basics

"High-resolution" mass spectrometers such as the JEOL time-of-flight mass spectrometers can separate ions that have the same

How Does a Spectrometer Work? An In-Depth Guide

Understanding how a spectrometer works and the various types available helps researchers make informed decisions

Gas chromatography-mass spectrometry

In chemical ionization (CI) a reagent gas, typically methane or ammonia is introduced into the mass

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