

Function of X-ray fluorescence spectrometer

Article Overview

An XRF spectrometer identifies and quantifies elements in a sample by measuring the characteristic X-ray fluorescence emitted when the sample is irradiated with high-energy X-rays.

Fundamental Principle

X-ray fluorescence (XRF) relies on the interaction between high-energy X-rays and atoms in a sample. When a sample is exposed to X-rays, the energy can eject tightly bound inner-shell electrons, creating vacancies in the atom's electron shells. Outer-shell electrons then transition to fill these vacancies, releasing energy in the form of secondary X-rays, known as fluorescent X-rays, which are characteristic of each element. The energy of these emitted X-rays is unique to the element, allowing qualitative identification, while the intensity of the emission correlates with the element's concentration, enabling quantitative analysis .

Instrument Components

An XRF spectrometer typically consists of:

- X-ray source: Generates high-energy X-rays, often using an X-ray tube with a metal anode. Electrons accelerated at high voltage strike the anode, producing X-rays that irradiate the sample .
- Detector: Measures the energy and intensity of the emitted fluorescent X-rays. Co...

Article Content

Jul 17, 2026

X Ray Fluorescence Spectrometry

X-Ray Fluorescence Spectrometry For X-ray fluorescence spectrometry (XRF) technique an X-ray excitation source is used and,

Jan 06, 2026

X-Ray Fluorescence Spectroscopy

X-ray fluorescence spectrometry is a non-destructive instrumental method of qualitative and quantitative analysis for chemical

Jul 14, 2026

X-Ray Fluorescence Spectroscopy

X-ray Fluorescence (XRF) XRF is similar to the energy dispersive spectroscopy used with SEM, in fact some SEM manufacturers

May 13, 2026

X-Ray Spectroscopy

X-Ray Spectroscopy- Principle, Instrumentation and Applications. X-ray spectroscopy is the techniques for

Jul 31, 2025

X-ray Fluorescence

This page titled X-ray Fluorescence is shared under a CC BY-NC-SA 4.0 license and was authored, remixed, and/or curated by

Sep 21, 2025

X-Ray Fluorescence Spectrometer

An x-ray fluorescence spectrometer from Bruker is the elemental analysis instrument of choice for many industry, academic, and

Aug 16, 2025

X-Ray Fluorescence Spectroscopy: Introduction, Latest

One of the most popular and straightforward methods for non-destructive multi-element

Aug 07, 2025

Principle of XRF Analysis : Hitachi High-Tech Corporation

X-ray fluorescence analysis can be thought of as spectrochemical analysis within an X-ray region. It has the same characteristics as

Nov 12, 2025

How does X-ray fluorescence work? | Metrohm

X-ray fluorescence (XRF) is a nondestructive technique for identifying and quantifying elements in solids, liquids, and

Apr 17, 2026

12.3: Atomic X-Ray Fluorescence Methods

Instruments In the previous section we covered the basic components that make up an atomic X-ray spectrometer: a source of X

Sep 07, 2025

What is XRF (X-ray fluorescence) and How Does it Work?

XRF (X-ray fluorescence) is a non-destructive analytical technique used to determine the elemental composition of

Feb 02, 2026

X-Ray Fluorescence Spectroscopy

6.8.6.3 X-Ray Fluorescence Spectroscopy X-ray fluorescence spectroscopy (XRF) is an analysis tool widely used for the elemental

Dec 18, 2025

X-Ray Fluorescence (XRF)

An X-ray fluorescence (XRF) spectrometer is an x-ray instrument used for routine, relatively

Oct 01, 2025

X-Ray Fluorescence

X-ray fluorescence (XRF) is defined as the emission of characteristic secondary X-rays from a sample that has been excited by high

Apr 13, 2026

X-Ray Fluorescence Spectrometers Information

X-ray fluorescence spectrometers provide a number of distinct advantages including easy sample preparation, nondestructive rapid

Nov 13, 2025

Introduction to X-Ray Fluorescence (XRF) Spectrometry

X-RAY FLUORESCENCE (XRF) SPECTROMETRY Basic Theory Although more popularly known for its diagnostic use in the

Aug 07, 2025

X-ray fluorescence

When an X-ray photon passes through, it causes a swarm of electron-hole pairs to form, and this causes a

Apr 09, 2026

X-Ray Fluorescence (XRF)

X-Ray Fluorescence is an analytical technique that can be used to determine the chemical composition of a wide

Apr 06, 2026

How XRF works | Bruker

XRF is an acronym for X-ray fluorescence, a process whereby electrons are displaced from their atomic orbital positions, releasing a

May 10, 2026

Basic Concepts of X-ray Fluorescence

Principles of X-ray Energy Spectroscopy X-ray Energy Spectroscopy (XES) is a technique for rapid, simultaneous multi-element

Nov 27, 2025

XRF Analysis & Principle Explained | Non-Destructive

When a sample is irradiated with X-rays, its atoms can emit secondary (fluorescent) X-rays at energies

Jun 22, 2026

The Working Principle of an XRF Spectrometer

The Working Principle of an XRF Spectrometer An X-ray fluorescence (XRF) spectrometer is an X-ray instrument that is employed

Oct 11, 2025

How Does an XRF Spectrometer Work?

X-ray fluorescence (XRF) spectrometry is the measurement and analysis of samples excited by incident radiation. It is a non

Apr 14, 2026

Key Components of X-ray Fluorescence (XRF) Spectrometer

Overview This page introduces key components of Energy Dispersive X-ray Fluorescence Analyzer (EDXRF). The EDXRF analyzer

Jul 18, 2026

X-Ray Fluorescence Spectrometry: Current Status and ...

Abstract This review covers characteristics and potential applications of various versions of the X-ray fluorescence

May 04, 2026

X-ray Fluorescence Spectrometry: Principle, Instrumentation, and ...

The X-ray fluorescence (XRF) spectrometer is an analytical instrument that employs X-ray technology to perform

Feb 25, 2026

X-Ray Fluorescence Spectroscopy

An X-ray spectrometer is used for remote sensing, as well as for in situ characterization of elemental composition through the

Dec 10, 2025

X-Ray Fluorescence Spectroscopy: Introduction, Latest ...

WDXRF offers a comprehensive, high-resolution examination of specific elements, especially in more complex

Jan 19, 2026

Handheld X-ray Fluorescence (XRF) Spectroscopy Learning Center

XRF is an acronym for X-ray fluorescence spectroscopy, and is used to determine the elemental composition of materials. In this

Aug 01, 2025

How does XRF Work?

X-Ray Fluorescence (XRF) Spectrometry The XRF technologies provide elemental analysis of a huge

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.iiss.co.za>

Email: sales@iiss.co.za

Phone: +27 63 174 2895

Address: Unit 8, Innovation Park, 15 Rivonia Road, Sandton, Johannesburg,
2196, South Africa

This document is for informational purposes only. Specifications subject to
change without notice.

