

Principle of Handheld Fluorescence Spectrometer



Overview

A fluorescence spectrophotometer, also called a spectrofluorometer or fluorometer, measures the light emitted by a sample after excitation by specific wavelengths. This tool offers exceptional sensitivity and selectivity, allowing detection of trace analytes down to single-molecule. XRF is an analytical technique used by many industries, notably the mining, metals, steel, and manufacturing sectors, for non-destructive online analysis and measurement of the elemental composition of materials. Whilst handheld XRF can be used by non-experts, with pre-programmed settings allowing positive materials identification, the detection of impurities in production materials or the screening of food for toxic heavy metals (and more), you may still be curious about what is happening behind the scenes. An X-ray fluorescence (XRF) spectrometer is an X-ray instrument that is employed for the routine chemical analysis carried out on sediments, rocks, minerals and fluids. It is a relatively non-destructive technique that works on wavelength-dispersive spectroscopic principles. Some examples include: metal alloys, precious and exotic metals, plastic, soil, ore, ceramic, paint, paper, mineral assay.



Article Content

Aug 17, 2025

LANScientific TrueX 700 Portable Energy Dispersive X-Ray Fluorescence ...

Overview The LANScientific TrueX 700 is a handheld energy dispersive X-ray fluorescence (EDXRF) spectrometer engineered for field-deployable, non-destructive elemental analysis of heterogeneous

Jun 24, 2026

Handheld XRF Basics

Handheld XRF (HHXRF) is unique in that you can take the battery operated analyzer to the sample rather than bringing the sample into the lab. This is especially

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Handheld X-Ray Fluorescence (HHXRF)

Classical XRF analysis is realized either as wavelength-dispersive or an energy-dispersive based method. HHXRF analyzers are designed for ruggedness, immunity to

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Hand-held X-ray fluorescence spectrometry

Hand-held XRF extends the principle of non-destructive analysis to enable larger samples or objects to be measured in position. Instrumentation, such as the example in Fig. 1, is often calibrated for a speci

May 10, 2026

LANScientific ScopeX Desktop Energy Dispersive X-Ray Fluorescence ...

Overview The LANScientific ScopeX Desktop Energy Dispersive X-Ray Fluorescence (ED-XRF) Spectrometer is an industrial-grade benchtop analyzer engineered for precise, non-destructive

Apr 12, 2026

AELAB Portable XRF Spectrometer 5000 – Handheld Alloy ...

Description The AELAB Portable XRF Spectrometer is a compact and efficient tool designed for analyzing metal alloys and precious metals. This handheld device uses X-ray fluorescence (XRF)

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LANScientific ScopeX Desktop Energy Dispersive X-Ray Fluorescence ...

Overview The LANScientific ScopeX is a benchtop energy dispersive X-ray fluorescence (ED-XRF) spectrometer engineered for precise, non-destructive elemental analysis of glass compositions and

Jul 24, 2025

Hand-held X-ray fluorescence spectrometry

This Technical Brief describes the evolution introduced into a spectrometer is Evolution of hand-held technology of hand-held X-ray fluorescence instrumentation designed for inorganic elemental

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How does handheld XRF work?

How does handheld X-ray fluorescence (XRF) technology work? XRF is an acronym for X-ray fluorescence spectroscopy. XRF is a non-destructive analytical technique used to determine the

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Hand-held X-ray fluorescence spectrometry

Abstract This Technical Brief describes the evolution of hand-held X-ray fluorescence instrumentation designed for inorganic elemental analysis outside the confines of

Sep 08, 2025

LANScientific TrueX 880/980 Series Handheld Energy Dispersive X

Overview The LANScientific TrueX 880/980 Series is a field-deployable, handheld energy dispersive X-ray fluorescence (ED-XRF) spectrometer engineered for rapid, non-destructive elemental analysis of

Apr 07, 2026

Thermo Scientific Niton™ XL5 Plus Handheld X-Ray Fluorescence

Overview The Thermo Scientific Niton™ XL5 Plus Handheld X-Ray Fluorescence (XRF) Spectrometer is an industrial-grade elemental analyzer engineered for precision, speed, and field-deployable

Apr 29, 2026

Thermo Scientific Niton XL3t800 Handheld Energy Dispersive X-Ray ...

Overview The Thermo Scientific Niton XL3t800 is a field-deployable, handheld energy dispersive X-ray fluorescence (EDXRF) spectrometer engineered for rapid, non-destructive elemental analysis of

Jan 11, 2026

PeDX Portable Energy Dispersive X-Ray Fluorescence Spectrometer

Overview The PeDX Portable Energy Dispersive X-Ray Fluorescence Spectrometer is an industrial-grade handheld ED-XRF analyzer engineered for rapid, non-destructive elemental quantification in

Aug 21, 2025

Handheld XRF: How it works

Here is a detailed breakdown of the process: An X-ray beam with enough energy to impact the electrons in the inner shells of the atoms in a sample is created by an

Oct 16, 2025

Brookfield LANScientific TrueX800 Handheld Energy Dispersive X

Overview The Brookfield LANScientific TrueX800 is a handheld energy dispersive X-ray fluorescence (EDXRF) spectrometer engineered for rapid, non-destructive elemental analysis of metallic alloys

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X-ray fluorescence

A X-ray fluorescence spectrometer with automated sample feed in a cement plant quality control laboratory XRF scanning of the Rembrandt painting Syndics of the

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The Working Principle of an XRF Spectrometer

How does an XRF Spectrometer Work? An XRF spectrometer consists of two primary components; the x-ray output and a detector that is sensitive enough to determine fluorescent x-rays from the incident

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Amazon : Spectrometer Handheld

Explore a wide range of handheld spectrometers for light measurement and analysis. Find portable spectrum analyzers for research, LED testing, and more.

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X-ray fluorescence spectrometry for environmental analysis: Basic ...

This review describes the basic principles, instrumentation and advances in the application of X-ray fluorescence instrumentation to the environmental sciences research topics,

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Fluorescence Spectrophotometer: Working Principles Explained

The fluorescence spectrophotometer is a powerful analytical instrument that leverages the emission of light from excited molecules to detect and quantify substances with great sensitivity and

May 24, 2026

X-ray fluorescence spectrometry for environmental analysis: Basic ...

X-ray fluorescence spectrometry (XRF) is a well-established analytical atomic technique for qualitative and quantitative chemical analysis of environmental samples with various matrices and

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Explain the working principal of the following AAS u ...

Working Principle of AAS (Atomic Absorption Spectrometer) Atomic Absorption Spectrometry (AAS) is an analytical technique used to determine the concentration of specific metal

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