

analytical instrumentation handbook pdf

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Spectroscopy is a cornerstone of analytical chemistry and is thoroughly covered in the handbook. Topics include atomic absorption, UV-Vis spectroscopy, infrared spectroscopy, and nuclear magnetic resonance (NMR). Each subsection provides theoretical background, instrument configuration details, and application examples.

Chromatographic Methods

Chromatography is essential for separating and analyzing complex mixtures. The handbook explains various chromatographic techniques such as gas chromatography (GC), liquid chromatography (LC), high-performance liquid chromatography (HPLC), and thin-layer chromatography (TLC). Practical tips for sample preparation, column selection, and data interpretation are included.

Electrochemical Analysis

Electrochemical methods are widely used for quantitative and qualitative analysis. The handbook covers potentiometry, voltammetry, and coulometry, with explanations of electrode types, measurement protocols, and common challenges encountered in electrochemical experiments.

Mass Spectrometry

Mass spectrometry is a powerful tool for molecular identification and quantification. This section explores the principles of ionization, mass analyzers, and detector technologies, as well as real-world applications in proteomics, environmental analysis, and drug discovery.

Emerging Analytical Technologies

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