

Use of Sulphonamido Anilines in Analytical Chemistry

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Abstract

Sulphonamido anilines are an important class of organic compounds that have attracted considerable interest in analytical chemistry because of their versatile chemical properties, functional groups, and ability to participate in selective reactions with various analytes. Their molecular structures contain sulphonamide and aniline functionalities, which can provide useful coordination, complexation, and chromogenic properties for analytical applications. This study explores the use of sulphonamido anilines in qualitative and quantitative chemical analysis, with particular emphasis on their application as analytical reagents, complexing agents, and sensing materials. These compounds can interact with metal ions and other chemical species through suitable donor atoms, producing measurable changes in colour, absorbance, fluorescence, or other physicochemical properties. Such reactions can be utilized for the detection and estimation of selected metal ions and inorganic or organic analytes. Spectrophotometric and colorimetric techniques based on sulphonamido aniline derivatives offer advantages such as relatively simple instrumentation, sensitivity, and potential selectivity. Structural modification of the parent compounds can further improve analytical performance by altering electronic properties, solubility, and binding affinity. Modern analytical approaches, including UV–visible spectroscopy, fluorescence methods, chromatography, and electrochemical techniques, can complement these reagents and expand their practical applications. However, factors such as reagent stability, interference from coexisting ions, reaction conditions, detection limits, and reproducibility require careful evaluation. The study highlights the potential of sulphonamido anilines as adaptable analytical reagents and emphasizes the importance of molecular design and systematic characterization for developing sensitive and selective analytical methods.

Keywords: Sulphonamido Anilines, Analytical Chemistry, Analytical Reagents, Metal Ion Detection, Spectrophotometry, Colorimetry, Complexation, Chemical Sensors, Selectivity, Quantitative Analysis.

