

Simultaneous Determination of Luliconazole and Salicylic Acid by Simultaneous Equation Method and Absorbance Ratio Method

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Abstract: *The simultaneous determination of Luliconazole and Salicylic Acid in pharmaceutical formulations holds significant importance for ensuring therapeutic efficacy and patient safety. This research focuses on developing an accurate and efficient method using UV-Visible spectrophotometry, specifically the Simultaneous Equation Method (SEM) and Absorbance Ratio Method (ARM), to quantify these active ingredients in topical creams. The study begins with the preparation of stock solutions and selection of the analytical wavelength, with 298 nm chosen in reference to the isobestic point at 230 nm. Cream samples containing 10 mg Luliconazole and 30 mg Salicylic Acid are prepared, sonicated, and filtered for analysis.*

The UV method is validated in accordance with ICH guidelines, encompassing linearity, precision, LOD, LOQ, specificity, robustness, and accuracy. Calibration curves show excellent linearity within the concentration range of 5-30 µg/ml for both compounds. Intra-day and inter-day precision studies exhibit low % RSD values, indicating the reliability and reproducibility of the method. LOD and LOQ values demonstrate the sensitivity of the method, enabling detection and quantification at trace levels. Specificity is confirmed through overlay spectra and comparisons of analyte responses.

Robustness is assessed by varying temperature and concentration, demonstrating the method's resilience to minor changes. Accuracy is evaluated through the standard addition method, yielding recoveries within acceptable limits. The proposed UV method is successfully applied to the analysis of Luliconazole and Salicylic Acid in commercial cream samples, with assay results confirming its accuracy and suitability for routine quality control.

Keywords: Simultaneous determination, Luliconazole, Salicylic Acid, UV-Visible spectrophotometry, pharmaceutical formulations, combination therapy, analytical validation.

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