SHORT COMMUNICATION

SENSITIVE AND TRACE DETERMINATION OF ALBENDAZOLE BY SPECTROPHOTOMETRIC METHOD

ABSTRACT

This study focuses on the interaction between albendazole and iron, forming a complex that exhibits unique properties. The albendazole-iron complex shows a maximum absorbance at 420 nm, indicating a strong interaction between the two components. This interaction results in a molar absorptivity, a measure of how strongly the complex absorbs light at a given wavelength, of 1×10^3 L mol^{-1} cm^{-1}. The complex follows Beer's law, a fundamental concept in spectroscopy, within a concentration range of 0.082 – 0.82 µg mL^{-1}. This means that the absorbance is directly proportional to the concentration of the complex in this range, allowing for accurate determination of albendazole concentration in a sample. The sensitivity of this method, as indicated by Sandell's sensitivity, is 0.266 µg mL^{-1}. This means that changes in concentration as small as 0.266 µg mL^{-1} can be detected, making this method highly sensitive. Furthermore, the limit of detection (LOD), the smallest concentration that can be reliably measured, is 0.067 µg mL^{-1}. The limit of quantification (LOQ), the lowest concentration that can be accurately quantified, is 0.20 µg mL^{-1}. These values indicate that this method can reliably detect and quantify even small concentrations of albendazole. The effectiveness of this method has been demonstrated by determining albendazole in commercial tablets. This suggests that this method could be widely applicable for the analysis of albendazole in various pharmaceutical formulations, contributing to quality control and assurance in the pharmaceutical industry.