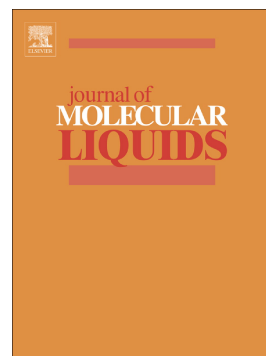


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Improved spectrofluorimetric determination of mebendazole, a benzimidazole anthelmintic drug, through complex formation with Lanthanum (III); Application to pharmaceutical preparations and human plasma

Sayed M. Derayea ¹, Ahmed A Hamad ², Dalia M. Nagy ¹, Deena A Nour-Eldeen¹, Hassan Ali ³, Ramadan Ali ²

¹ Analytical Chemistry Department, Faculty of Pharmacy, Minia University, Minia 61519, Egypt

² Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Al-Azhar University, Assiut branch, Assiut 71524, Egypt

³ Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Assiut University, Assiut, Egypt

Abstract

A, rapid and specific spectrofluorimetric procedure was developed and validated for determination of mebendazole. The reaction of mebendazole with lanthanum (III) ions in aqueous buffered solution (pH 5.5) produced a highly fluorescent stable complex which exhibited an emission at 340 nm (λ_{ex} 295 nm). Different types of surfactant were examined to enhance the fluorescence of the complex but none of them was effective. Other reaction parameters that affect the formation and stability of the resulting complex were studied and adjusted. The linearity range for the relationship between the fluorescence intensity and the drug concentration was 0.07 – 0.8 $\mu\text{g ml}^{-1}$ with a correlation coefficient (r) of 0.9997. The quantitation and detection limits were 0.068 and 0.022 $\mu\text{g ml}^{-1}$, respectively. The metal was found to react with the drug in the ratio of 2:1 drug to metal with a binding constant of 1.67×10^5 . The change in Gibb's free energy for the reaction was $-29.8 \text{ KJ mol}^{-1}$, which indicates the high feasibility of the reaction. Some dosage forms and spiked human plasma were analyzed successfully with the developed method with high recovery. The main percentage recovery was in the range of 100.32 - 100.52 % for dosage forms and 94.74 - 97.31% for spiked plasma. The results of both the reported and proposed methods were statistical compared and the comparison revealed good accuracy and precision of the proposed method.

Keywords: Mebendazole; metal complex; Lanthanum; spectrofluorimetry; pharmaceutical analysis; Human plasma

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