

COMPARISON OF SPECTRAL CHARACTERISTICS OF FAMOTIDINE IN DIFFERENT SOLVENTS

Lytvynenko Y. Y., Myhal A. V., Golovchenko O. S., Georgiyants V. A.

National University of Pharmacy, Kharkiv, Ukraine

zenyalyt@gmail.com

Introduction. Nowadays the presence of accessible and recreated methods of quality control of drugs is very important. Preliminarily the investigations of possibility of famotidine identification by using coloured reactions of interaction between the substance and the solutions of metal salts were undertaken by us. Besides that, the physico-chemical methods of analysis are commonly used to standardize and control the quality of active pharmaceutical ingredients of organic nature. USP and Ph.Eur. suggest using the absorption spectrophotometry in the ultraviolet and visible region of spectrum for famotidine identification. This method can be applied due to the presence in the famotidine's structure of chromophores: double bounds and the thiazoline core. Taking into account famotidine chemical properties, its absorbance will depend on pH of test solution that is specific enough by itself and it can be used for identification.

Aim. The aim of our investigation was to research changes in characteristics of famotidine's spectra depending on the value of pH of the environment.

Materials and methods. The measurement of the absorbance of the test solutions was carried out on a spectrophotometer in the range of spectrum from 220.0 nm to 350.0 nm wavelength. 0.001% solutions of famotidine in corresponding solvents were prepared for this study. 0.1 M hydrochloric acid solution; 0.1 M sodium hydroxide solution and water were used as solvents. Corresponding solvents were used as the compensation solutions.

Results and discussion. The results of carried out investigations showed the spectra, that were measured in 0.1 M HCl and water differ between themselves insignificantly. The absorption maxima are observed at 220.0 ± 2 nm. In spectrum of famotidine alkaline solution, unlike solutions in other solvents, bathmochromic changes are observed. It also should be noted that famotidine sodium salt has more expressed absorption maximum, in contrast to the ionized acidic form of famotidine, and it is observed at $\lambda_{\max} = 228.0 \pm 2$ nm. The changes of spectral characteristics in different solvents can be related to the presence of the sulfonamide group. As a result of interaction with the hydrochloric acid solution due to tertiary N-atom famotidine forms salt that hydrolyses in water solutions. This fact causes insignificant difference of spectra, which were measured in 0.1 M hydrochloric acid solution and water. In the case with NaOH, salt appears due to a substitution of the H-atom on the Na-atom in a sulfonamide group by the Sulphonamides type, which causes changes of electronic density in the molecule of famotidine and changes in the spectral picture.

Conclusions. The results of experimental data show that it is reasonable to use 0.1 M NaOH as a solvent for identification and for assay, as the absorption maximum of famotidine in those conditions is the most expressed and specific.