Progress in Chemical Science Research

Vol. 9

Edited by Prof. Mohamed M. El Nady

B P International

Progress in Chemical Science Research

Vol. 9

India ▪ United Kingdom

B P International

Editor(s)

Prof. Mohamed M. El Nady

Department of Organic Geochemistry and Petroleum Geology, Exploration, Egyptian Petroleum Research Institute, Egypt.
Email: mohamedelnady217@gmail.com;

FIRST EDITION 2023

ISBN 978-81-19217-78-6 (Print)
ISBN 978-81-19217-79-3 (eBook)
DOI: 10.9734/bpi/pcsr/v9

Contents

Print ISBN: 978-81-19217-78-6, eBook ISBN: 978-81-19217-79-3

Chapter 5

First and Second Order Derivative Spectrophotometric Methods for Simultaneous Determination of Emtricitabine and Tenofovir Disoproxil Fumarate Tablets

B. Valli Purnima [a,b], G. Ramu [c] and D. Ramachandran [a*]

DOI: 10.9734/bpi/pcsr/v9/19277D

ABSTRACT

Emtricitabine and tenofovir disoproxil fumarate in pure and tablet dose forms are simultaneously estimated using first and second order derivative spectrophotometric methods devised in the current study. Emtricitabine and tenofovir disoproxil Fumarate were combined to create a standard/sample, and the spectra of the absorption, first order, and second order derivatives were recorded in comparison to a reagent blank. With absorbance values of 0.639, 0.420, and 0.164, respectively, three peaks at 265 and 215 nm and one valley at 235 nm were noted in the absorption spectra. In the first order derivative spectrum, three positive peaks at 380, 325, and 260 nm and three negative peaks at 355, 280, and 225 nm were identified. The peak at 260 nm and the valley at 280 nm have the highest positive and negative amplitudes, respectively, compared to the other peaks and valleys. In the second order derivative spectrum, three peaks at 365, 290 and 250 nm with highest positive amplitude at 250 nm and three valleys at 350, 265 and 215 nm with maximum negative amplitude at 215 nm were noted. In order to validate the approach for tenofovir disoproxil fumarate and emtricitabine, positive amplitudes at 282.4 nm and negative amplitudes at 258.7 nm in the combined first derivative spectrum, respectively, were measured. Emtricitabine was validated using the amplitude of the second derivative sharp peak at 282.4 nm in the case of the second derivative method. Emtricitabine interferes with measurements of tenofovir disoproxil Fumarate at 258.7 nm, so the difference between the two amplitudes was used to validate the method for tenofovir disoproxil Fumarate. System and procedure precision RSD percentages were found to be within acceptable bounds. Accuracy trials at three spiking levels indicated that the mean recovery

[a] Department of Chemistry, Acharya Nagarjuna University, Guntur, India.
[b] Department of Chemistry, Sir C. R. Reddy College for Women, Vatluru, Eluru, India.
[c] Department of Chemistry, Sir C. R. Reddy College-Autonomous, Eluru, India.
*Corresponding author: E-mail: dittakavirc@gmail.com;