ELECTROCHEMICAL OXIDATION OF ANTIRETROVIRAL DRUG FOSAMPRENAVIR AT GLASSY CARBON ELECTRODE AND ITS DIRECT DETERMINATION IN PHARMACEUTICAL DOSAGE FORMS BY SQUARE WAVE AND DIFFERENTIAL PULSE VOLTAMMETRY

Mehmet GUMUSTAS, Sibel A. ÖZKAN

Ankara University, Faculty of Pharmacy, Department of Analytical Chemistry, 06100, Ankara / Turkey;
Hitit University, Science & Literature Faculty, Department of Chemistry, 19040, Corum / Turkey

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Fosamprenavir (AMP) is a phosphate ester prodrug of the antiretroviral protease inhibitor Amprenavir. Amprenavir showed excellent antiretroviral activity and good tolerability in clinical studies. FAMP is a good prodrug of amprenavir that reduces the tablet burden and is expected to enhance patient compliance during HIV therapy. Phosphate prodrugs can be designed to improve the oral absorption of poorly water-soluble compounds. The human body metabolizes FAMP in order to form amprenavir, which is the active ingredient (1).

To our knowledge, there is no written information about the electrochemical behavior and oxidation mechanism of FAMP. In this study, we aim that the investigation of electrochemical behavior and development of new voltammetric methods for the direct determination of FAMP in pharmaceutical dosage forms and raw materials without any time-consuming extraction or evaporation steps prior to drug assay.

FAMP is oxidizable at the glassy carbon (GC) electrode. The electrochemical process was studied with variations of pH effects, nature of the buffer and scan rate. Despite the scan rates from 5mVs⁻¹ to 1000mVs⁻¹ the oxidation of FAMP was irreversible and exhibited diffusion controlled process. In this study, the electro-oxidative behavior of FAMP at GC electrode was carried out using different electrochemical techniques such as LS, CV, DP and SW voltammetry.

These two voltammetric techniques for the determination of FAMP in phosphate buffer at pH 2 which allows quantitation over the 1x10⁻⁵ – 1x10⁻⁴ M range in supporting electrolyte with a slope of 1.89x10⁴; intercept of 0.2016 and the limit of detection was 5.052x10⁻⁷ M for DPV and with a slope of 1.76x10⁴; intercept of 0.2082 and the limit of detection was 3.83x10⁻⁷ M for SWV were proposed. The repeatability and reproducibility of the methods for all media were determined.

Voltammetric validation procedures are also described for the determination of FAMP in bulk form and pharmaceutical formulation. According to the linear relation between the peak current and the concentration, differential pulse and square wave voltammetric methods for its quantitative determination in pharmaceutical dosage forms were developed. Precision and accuracy were also checked by recovery studies.

References

1. RxMediaPharma Interactive Drug Information Source 2009, L.Ustunes (Author).