

DETERMINATION OF THE DELAYED RELEASE BEHAVIOR OF DICLOFENAC SODIUM TABLETS AVAILABLE IN SRI LANKA USING CYCLIC VOLTAMMETRY

Sewwandi A.A.M.¹ and Soysa H.S.M.^{1*}

¹Department of Physical Sciences and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Sri Lanka

*sasimali@appsc.sab.ac.lk

Diclofenac sodium is a commonly used anti-inflammatory delayed released drug. Determination of delayed release behavior of diclofenac sodium by using easy technique in the industry is very important because from that the quality of bi-layered coat design can be checked out easily. There are various techniques for detection of diclofenac sodium according to the literature. Among them due to its electro-activity, cyclic voltammograms were used to detect diclofenac sodium using different kinds of modified working electrodes. Those modifications are for very sensitive detection of diclofenac sodium and they are quiet hard to make. In this study, we have developed a simple method to determine the delayed release behavior of diclofenac sodium by introducing bare platinum electrode as the working electrode in cyclic voltammetry. The selected reference and the counting electrodes were silver- silver chloride electrode and carbon electrode respectively. Delayed release behavior of three different brands of diclofenac sodium tablets available in Sri Lanka was checked in pH 7.2 Phosphate buffer as the dilution medium. The graphs of drug concentration versus time can be plotted from the cyclic voltammograms data, to study delayed release behavior of the selected drugs. The limit of detection and the limit of quantification of used bare platinum electrode were 0.21 mM and 0.63 mM respectively. Other than the determination of the delayed release behavior, optimum pH values for the maximum solubility, the weight variations of tablets and the effectiveness of drug coating formulation of the selected three brands were also determined. The method can be applied for the tablet coating quality checking in pharmaceutical industry.

Keywords: *Diclofenac sodium, Delayed released drug, Cyclic voltammetry*