Electrochemical Methodology for NSAID's Determination and its Interaction with Steroid Dexamethasone

Sobia Tahir¹, Kousar Yasmeen^{1,*}, Muddasir Hanif^{2,*}, Obaid Khaliq¹, Haji Muhammad¹, Hafsa¹, Iftikhar Ahmed Tahiri¹, Sajid Jahangir¹, Syed Tahir Ali¹

¹ Department of Chemistry, Faculty of Science, Federal Urdu University of Arts, Science and Technology, Gulshan-e-Iqbal Campus, Karachi-75300, Pakistan

² Department of Chemistry and Chemical Engineering, Jiangxi Normal University, Nanchang, Jiangxi, 330022, People's Republic of China

*E-mail: muddasirhanif@yahoo.com (M. Hanif), kauseryasmeen@fuuast.edu.pk (K. Yasmeen)

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The new generations of Non-Steroidal Anti-inflammatory Drugs (NSAIDs) are COX-2 selective cyclooxygenase-2 inhibitors (analgesic and anti-inflammatory) capable to cause adverse gastrointestinal events due to drug interactions between one or more co-administered medicines. This causes alteration of the efficacy or toxicity of the co-administered drug. This study presents an electrochemical method (CV) evaluation to study the interactions of Naproxen Sodium and Piroxicam with Dexamethasone (Steroid) under optimized conditions. The proposed method is electrochemically diffusion controlled as both drugs showed different diffusion coefficients (Piroxicam: 2.188×10^{-7} ; Naproxen Sodium: 3.755×10^{-5}). The method has good reproducibility and validated according to ICH guide lines ($R^2 = 0.9994$ for Naproxen Sodium and 0.9991 for Piroxicam). The interactions were confirmed by the FTIR studies indicated the variation of wave number and intensity of significant peaks thereby revealed possible interaction sites.

Keywords: Cyclic voltammetry, FTIR, NSAIDs, Piroxicam, Naproxen Sodium, Dexamethasone.

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