VOLTAMMETRIC BEHAVIOR OF RISPERIDONE AND ITS DETERMINATION IN PHARMACEUTICAL PREPARATIONS

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Risperidone (RPN) is an atypical antipsychotic. It is chemically known as 3[2-[4-[6-fluoro-1,2-benzisoxazol-3-yl]piperidin-1-yl]ethyl]-2-methyl-6,7,8,9 - tetrahydro - 4H - pyrido[1,2-α]pyrimidin - 4-one (Fig.1). In 2007, Risperdal (RPL) was approved as the only drug agent available for treatment of schizophrenia in youth ages [1,2]. In this study, the electrochemical behavior of risperidone (RPN) and its quantitative determination were investigated by using various voltammetric methods. Electrochemical parameters such as diffusion coefficient, number of electrons transferred in electrochemical step and surface coverage coefficient were calculated by using cyclic voltammetry (CV). It is concluded that reversible reduction of RPN at about -1.55 V vs. Ag/AgCl reference electrode is controlled mainly by adsorption with some diffusion contribution. Therefore, new, rapid, selective and simple electrochemical methods including differential pulse voltammetry (DPV), square-wave voltammetry (SWV) and square-wave cathodic adsorptive stripping voltammetry (SWCAdSV) for the direct determination of RPN in pharmaceutical dosage forms without time-consuming steps prior to drug assay were developed. Limit of detection (LOD) was found as 3.0×10⁻⁹ mol.L⁻¹ in SWCAdSV. The methods were validated by investigation of elements such as linearity range, limits of detection and quantitation, accuracy, precision, selectivity, robustness. Proposed methods were applied to determine the RPN content of commercial pharmaceutical preparations. The percentage recoveries and their relative standard deviations were found to be 100.40 and 1.32 respectively.

Fig.1. Structural formula of RPN

REFERENCES