Research Article

Polarographic Investigation on Taxim-of in presence of nickel (II)

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Abstract

A polarographic method has been developed for the analysis of Taxim-of and Cobalt (II) in pharmaceutical dosage forms. It is possible to determine the cobalt (II) and Taxim-of in the range of 1.0×10^{-7}M to 1.0×10^{-6}M and 0.146 to 1.46 µg/25ml. Well defined peaks at potentials -0.95V Vs SCE for Taxim-of and- 1.05V Vs SCE for Ni (ll) were obtained respectively.

Keywords: Polarographic method, Taxim-of and Nickel (II) system

1. Introduction

Taxim-of is a combined drug of Cefixime and Ofloxacin. Cefixime is an antibiotic used for the treatment of various infections. Ofloxacin is a synthetic chemotherapeutic antibiotic[1-4]. It is developed as a broader spectrum analogue of Norfloxacin. This antibiotic is active against gram positive and gram negative bacteria. Taxim-of a combination of these two is being used for the treatment of various vital infections. A wide variety of simple, selective methods for the determination of this drug using colour reaction with metal ion is developed. Conditions for the maximum colour development will be established for studying the effect of pH, metal ions concentration, drug concentration, time and other parameters.

2. Material and Methods

2.1 Reagent and materials: Hydrochloric acid, Acetic acid, Sodium acetate, Ammonium Chloride, Ammonium hydroxide, Taxim-of, Cobalt Nitrate solutions and Nitrogen gas (all analytical reagents).

2.2 Equipment: Analytical balance, electrodes, ELICO digital pH meter (manufactured by Ms ELICO Pvt. Ltd.). ELICOPOLAROGRAPH this consists of three units (a) Dropping mercury electrode (b) Mains operated DC – polarographic unit (CL-23) (c) Mains operated self balancing strip chart recorder (LR-101P).

2.3 Preparation of Stock solutions

2.3.1 Preparation of drug solution: 100mg of Taxim-of weighed and taken in a 100ml volumetric flask and the solution is made up to the mark.

3. Experimental

2.5ml of Nickel (Ni[+2]) ion solution (5×10^{-6}M) and 2.5 ml of drug (Taxim-of) 0.01mg/ml are taken in a 25 ml standard flask. The solution is made up to the mark with an ammonical buffer of pH-9 Polarographic[6-10] cell was de-aerated with nitrogen for about 10 – 15 minutes. The polarogram is recorded and is shown in figure 1.

Fig.1. Potential V vs S.C.E.
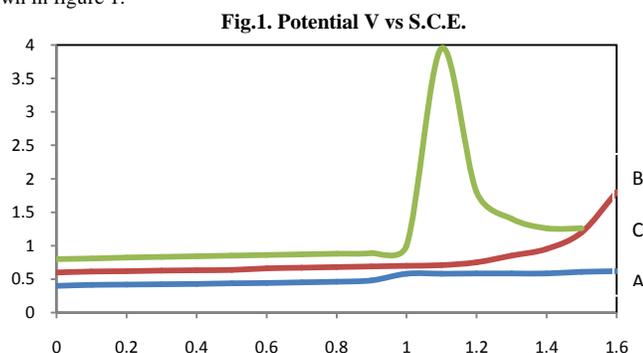
3. Results

The polarograms of (a) Ni (II) solution in ammonical medium (pH – 9) (b) Taxim-of in ammonical medium (c) Ni(II) + Taxim-of in ammonical medium. The polarograms reveals that Ni (II) shows a wave with a small current at -0.95V Vs SCE for Taxim-of at -1.05V Vs SCE.

3.1 Effect of metal ion concentration: The effect of metal ion concentration is studied keeping the drug (Taxim-of)[10-12] concentration of cobalt ion and the peak current was studied and the calibration plot drawn between the peak current and concentration of metal ion is shown in the fig. 2.

The studies reveal that Ni (II) can be determined in the concentration range 1.0×10^{-7}M to 1.0×10^{-6}M. The microgram range is 0.146 to 1.46 µg/25ml.
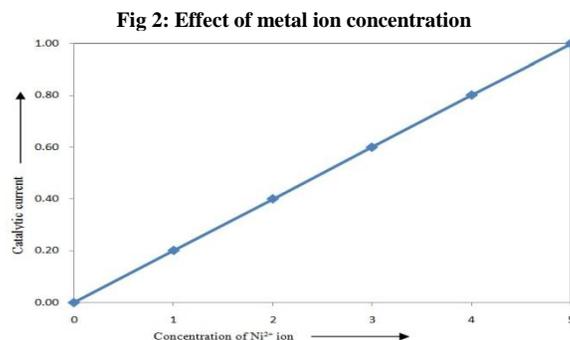
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Fig 2: Effect of metal ion concentration

3.2 Effect of drug (Taxim-of) concentration

The effect of drug concentration is studied keeping the metal ion concentration constant. The peak currents are measured at different concentration of drug Taxim-of These studies and reveal that the drug (Taxim-of) can be determined in the range of 0.146 mg/ml to 1.46 mg/ml using catalytic hydrogen waves, A graph is drawn between the concentration of Taxim-of and peak catalytic current. A graphical linear plot is obtained (fig-3) two concentrations of Taxim-of 0.05mg/ml to 0.5mg/ml can be determined with metal ion.

Fig 3: Effect of drug (Taxim-of) concentration
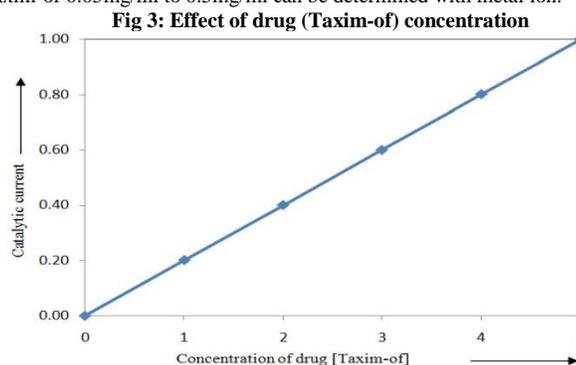
3.3 Effect of height of mercury column

The effect of height of mercury column on catalytic current is studied that there is no change in catalytic currents with different heights of mercury column. This observation reveals that the wave is not diffusion controlled. The data is presented in Table 1.

Table 1. Effect of height of mercury column

S. No	Height of mercury column (Cm)	Catalytic current (µA)
1	50	1.40
2	55	1.39
3	60	1.41
4	65	1.40
5	70	1.41
6	75	1.39

4. Conclusion

The proposed method is selective, accurate, precise, and sensitive. It is possible to determine the metal ion and Taxim-of in the range of 5.0×10^{-7}M to 5.0×10^{-6}M and 0.74 to 7.4 µg/25ml respectively in pharmaceutical samples.

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