



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

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Abstract

A new, simple, accurate, polarographic method have 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 $5.0 \times 10^{-7}M$ to $5.0 \times 10^{-8}M$ and 0.74 to 7.4 $\mu g/25ml$. Well defined peaks at potentials -0.9V Vs SCE for Taxim-of and 1.0V Vs SCE for CO (II) were obtained respectively.

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

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 antibiotic¹⁻⁴. 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 method 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.

Methodology

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

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

Preparation of Stock solutions: 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.

2.5ml of Cobalt (Co^{+2}) ion solution ($5 \times 10^{-6}M$) 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 Polarographic⁶⁻¹⁰ cell was deareated with nitrogen for

about 10 – 15 minutes. The polarogram is recorded and is shown in figure 1.

Results and Discussion

The polarograms of (a) Co(II) solution in ammonical medium (pH – 9) (b) Taxim-of in ammonical medium (c) Co(II) + Taxim-of in ammonical medium. The polarograms reveals that Co(II) shows a wave with a small current at -0.9V Vs SCE for Taxim-of at -1.0V Vs SCE.

Effect of Metal Ion Concentration: The effect of metal ion concentration is studied keeping the drug (Taxim-of) 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 figure 2. The studies reveal that Co(II) can be determined in the concentration range $5.0 \times 10^{-7}M$ to $5.0 \times 10^{-6}M$. The microgram range is 0.74 to 7.4 $\mu g/25ml$.

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 reveal that the drug (Taxim-of) can be determined in the range of 0.05 mg/ml to 0.5 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 (figure-3) two concentrations of Taxim-of 0.05mg/ml to 0.5mg/ml can be determined with metalion.

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

S.No	Height of mercury column cm	Catalytic current μA
1	50	1.20
2	55	1.21
3	60	1.19
4	65	1.21
5	70	1.20
6	75	1.21

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 $5.0 \times 10^{-7}\text{M}$ to $5.0 \times 10^{-6}\text{M}$ and 0.74 to 7.4 $\mu\text{g}/25\text{ml}$ respectively in pharmaceutical samples.

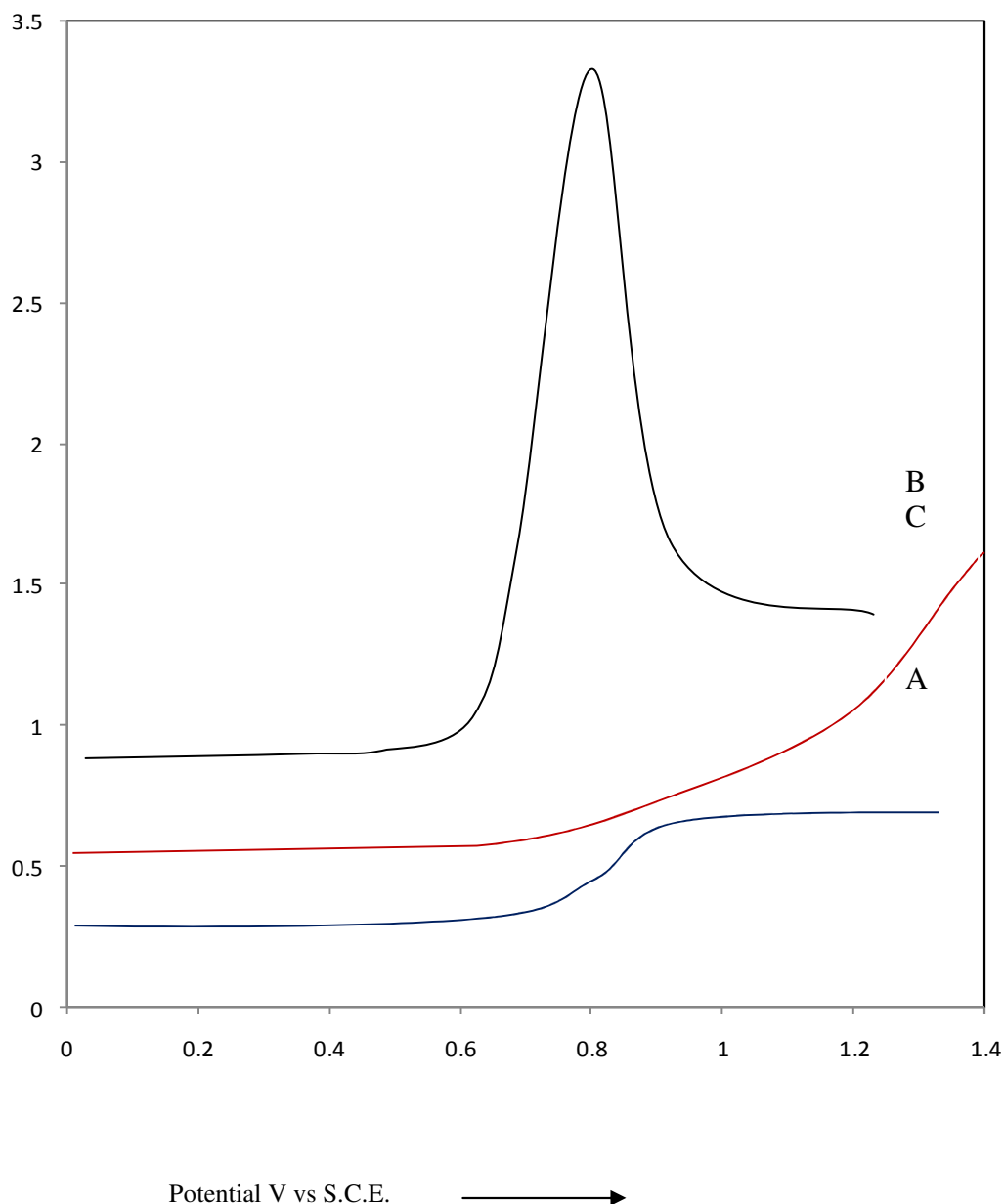


Figure-1
Polarogram

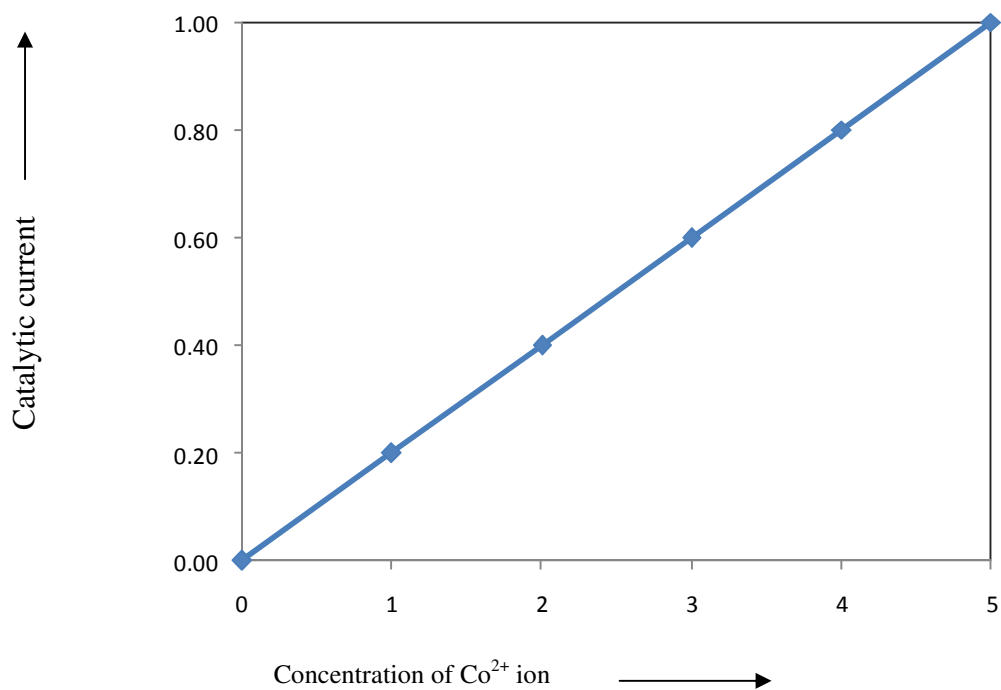


Figure-2
Calibration Plot drawn between the peak current and Concentration of Metal Ion

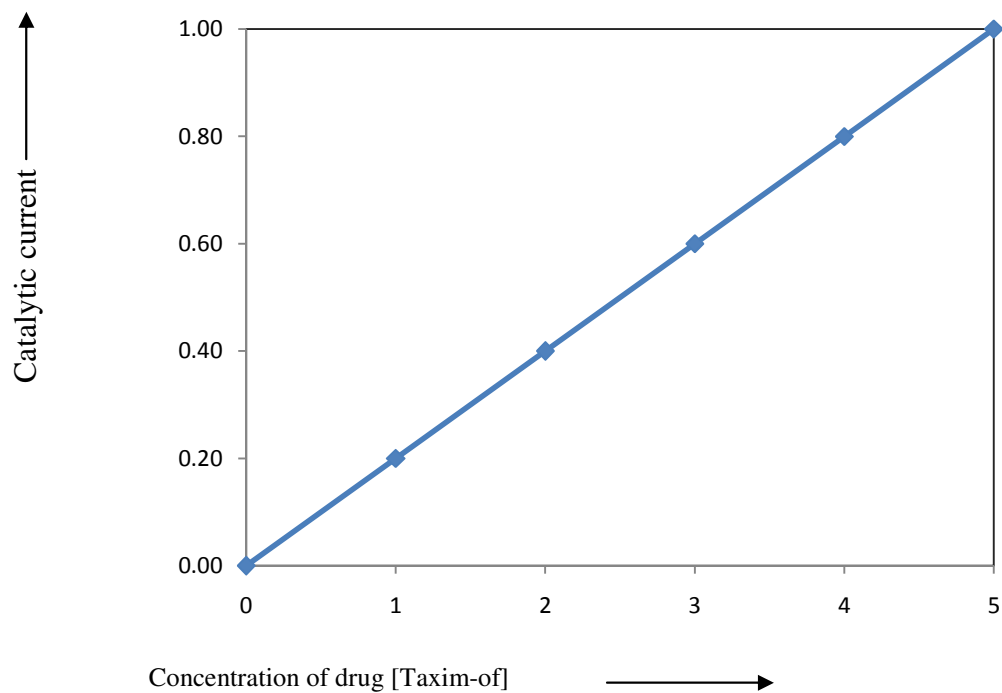


Figure-3
Graph between the concentration of Taxim-of and peak catalytic current

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