ejpmr, 2015,2(3),265-268

SJIF Impact Factor 2.026

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 3294-3211

EJPMR

A SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF HOSTACYCLINE AND COBALT (II)

***Y. Sivachandra[1] T. R. Kishore[2], V. Suryanarayana Rao[3]**

[1]Faculty of Chemistry, Govt. Degree College, Tadipatri, Anantapur, A.P., India.

[2]Faculty of Chemistry, Sri Chaitanya Jr. College, Anantapur, A.P., India.

[3]Department of Chemistry, S.K. University, Anantapur, A.P., India.

Article Received on 22/02/2015 **Article Revised on 13/03/2015** **Article Accepted on 04/04/2015**

***Correspondence for Author**

Y. Sivachandra

Faculty of Chemistry, Govt. Degree College, Tadipatri, Anantapur, A.P., India.

ABSTRACT

Analytical determination of Hostacycline (HTC) and Cobalt(II) in pharmaceutical formulation is carried based on a colour reaction between the two. Cobalt forms colour complex with HTC in the range of cobalt 24 – 192 mg/ml and HTC in the range of 0.01 – 0.06 mg/ml. This method is successfully applied for the determination of HTC and cobalt in pharmaceutical formulation.

KEYWORDS: Spectrophotometric method, HTC and cobalt system.

1. INTRODUCTION

Hostacycline (HTC) is a bright yellow crystalline salt. It is stable in air but darkens in colour upon exposure to strong sunlight. HTC is stable in acid solutions having a pH higher than 2. It is capable of forming chelate complexes with metal ions such as calcium and magnesium.

2. PREPARATION OF THE SOLUTION

The standard solution of metal ion is prepared by exactly weighing the required amount of the salt in analytical balance and transferring it to a standard flask, dissolving and making up to mark using double distilled water.

The drug solution is prepared by dissolving exactly 50mg of the Hostacycline in 100ml volumetric flask and the solution is made up to the mark with double distilled water. The solution is kept for about an hour for total dissolution.

Digital pH meter model CL21 of Elico company is used for the preparation of buffer solution of required pH, Elico microprocessor (μp) based double beam UV spectrophotometer SL164 is used to measure absorbance of the solution chosen for study.

3. REAGENTS

3ml of HTC solution of concentration 1 mg/ml are taken in a 25ml standard flask. The solution is made up to the mark with a buffer solution of required pH and shaken well for uniform concentration. Similarly a blank solution is prepared without metal ion. The spectra of the test solution is recorded against the respective blank solution.

4. RESULTS AND DISCUSSION

Effect of pH: The effect of pH on the complexation reaction is studied. The absorbance values increase up to pH 6.0 and then decreasing. A solution of pH 5 is chosen for further studies. The maximum absorbance is noticed at 400nm.

Effect of metal ion: The effect of cobalt concentration on the absorbance is studied at a fixed wavelength of 400nm. The concentration of HTC is kept constant at 0.06mg/ml. and pH of the solution is maintained at 6. From the result it may be concluded that cobalt(II) can be determined in the range of 24 – 192 μg/ml. The data is presented in figure-1.

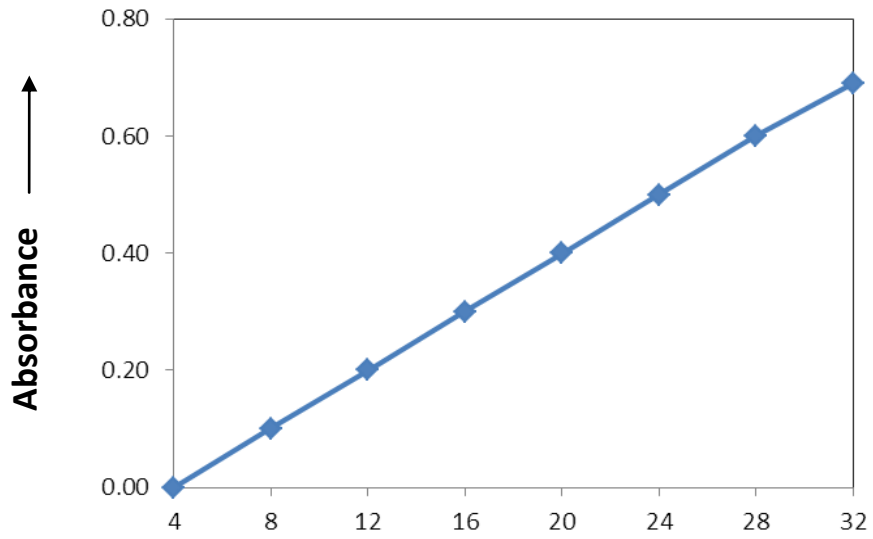

Fig-1 Effect of [Co(II)] on absorbance

pH = 6.0; [HTC] = 0.06 mg/ml; λ_{max} = 400 nm

4.2 Effect of Drug

The effect of HTC concentration is studied in the range 0.01 to 0.06 mg/ml. The absorbance values are measured at 400nm. The concentration of cobalt is fixed at $2x10^{-3}$M. From the result the drug can be determined in the range of 0.01 to 0.06 mg/ml. It is shown in figure-2.

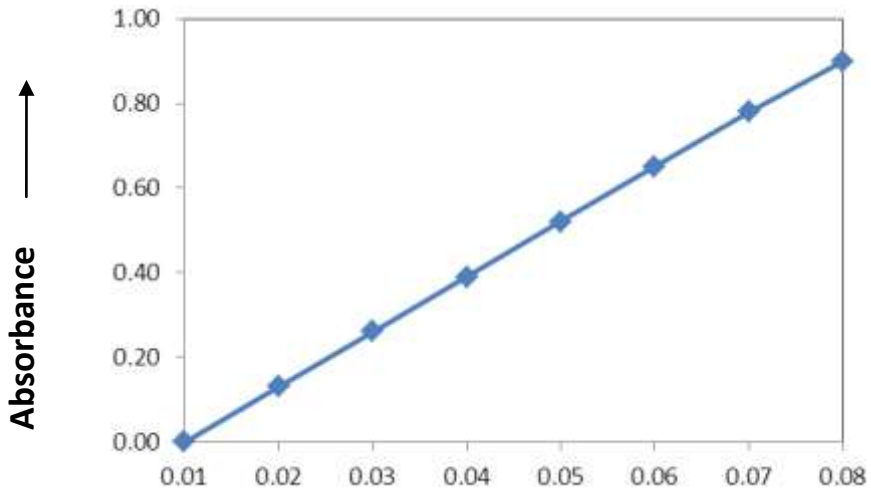

Fig-2 Effect of HTC on absorbance

pH = 6.0; [Co(II)] = 2 x 10^{-3}M; λ_{max} = 400 nm

4.3 Effect of time on the reaction

The effect of time on absorbance is studied for a period of 2 hours for a solution containing fixed concentration of the metal ion and drug. The results are presented in table-1. From the data reveals that the absorbance values are almost constant and a negligible decrease is observed.

Table-1: Effect of time on absorbance

Time (minutes)	Absorbance
0	0.703
15	0.700
30	0.693
45	0.683
60	0.632
75	0.605
90	0.595

pH=6.0 [Co(II)] = 2 x 10^{-3}M [HTC]= 0.06 mg/ml λ_{max} = 400 nm

4.4 Effect of organic solvents

Effect of organic solvents namely methanol, DMF, acetonirtile, acetone, isopropanol 50% by volume are investigated. The relevant data is presented in table-2. From the result it is observed that except methanol, other solvents influence the absorbance values to a considerable extent.

Table-2: Effect of Organic Solvent on absorbance

Solvent (50% by volume)	Absorbance
None	0.732
Methanol	0.618
DMF	0.323
Acetonitrile	0.295
Acetone	0.319
Isopropanol	0.485

pH=6.0 [Co(II)] = 2 x 10^{-3}M [HTC]= 0.06 mg/ml λ_{max} = 400 nm

5. CONCLUSION

The proposed procedure is useful for the determination of the metal ion and HTC in the range of 24 – 192 μg/ml and 0.01 – 0.06 mg/ml respectively.

6. REFERENCES

1. Sandell, E.B. “Colorimetirc determination of trans of metals”, Inter science, New York, 367 (1950).
2. Turczan., J. and Lau-Cam C. Spectroc. Lett., 1984; 17: 353.
3. Utpal Saha Analyst, 1986; 114: 1179.
4. Sultan, S.M., Analyst 1986; 111: 97.
5. Tolstoi L.G., Medcap Pharmacotherapy, 2002; 4(1).
6. Jamaluddin Ahmed, M and Shah Alam, MD Spectroscopy, 2003; 17: 45-52.
7. Ramadevi, B. and Rao, V.S.N., Indian J. Pharme Sci., 1993; 1: 40.
8. Suryanarayana Rao, V. The East Pharm., 1994.1075.