



SIMPLE AND SENSITIVE U.V SPECTROSCOPIC METHOD DEVELOPMENT OF CARVEDILOL IN PURE FORM AND DOSAGE FORM

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ABSTRACT

A Simple spectrophotometric method is developed for the estimation of Carvedilol (CAR) in bulk and in dosage forms using Hydrotropy (Co-solvency) (Method A & B). Method C was done using methanol as a solvent. Absorption maximum is (method A) 265nm, (method B & C) 286nm. Bears law is obeyed in the concentration range of 10-60 (method A), 0.1-0.6 (method B), 0.1-0.5 (method C).

Keywords: Carvedilol, Beer's law, Spectrophotometry, dosage form, Hydrotropy

INTRODUCTION

Carvedilol is a non-selective β -blocker indicated in treatment of congestive heart failure. It is chemically known as 1-(9H-carbazol-4-yloxy)-3-(2-(2-methoxy phenoxy) ethyl amino) propan-2-ol. It is administered orally. This paper describes 3 simple UV-spectroscopic methods using co-solvency (method A, method B) and with methanol (method C)

MATERIALS AND METHODS

REAGENTS:

All chemicals used were of analytical grade and all the solutions were prepared with distilled water. DMSO (Di Methyl Sulfoxide) for method-A, PEG4000 for method-B, Methanol for method-C, was used.

INSTRUMENT:

A Systronics UV visible single beam spectrophotometer model no 117 with 1cm matched quartz cells were used for all spectral methods.

ASSAY PROCEDURE:

METHOD-A:

The standard solution of CAR (1mg/ml) was prepared by dissolving the drug in 1ml of DMSO and made upto 10ml with distilled water.

Aliquots of standard CAR (1.0-6.0, 100 μ g/ml) were transferred into series of 10ml volumetric flasks. The solution was made upto the mark with distilled water and absorbance was measured at 265nm. The amount of the drug was computed from the respective calibration curve. All the spectral characteristics are given in table.

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METHOD-B:

The standard solution of CAR (1mg/ml) was prepared by dissolving drug in 5ml PEG 4000 and made upto 10ml with distilled water to get 666.66 μ g/ml.

Aliquots of standard CAR (0.1-0.6, 6.66 μ g/ml) were transferred in a series of 10ml volumetric flasks. The solution was made upto the mark with distilled water and the absorbance was measured at 286nm. The amount of drug was computed from the respective calibration curve. All the spectral characteristics are given in table.

METHOD-C:

Standard solution of CAR (1mg/ml) was prepared by dissolving drug in methanol and made upto the mark with 10ml methanol.

Aliquots of standard CAR (0.1-0.5, 10 μ g/ml) were transferred into a series of 10ml volumetric flasks. The solution was made upto the mark with distilled water and absorbance was measured at 286nm. The amount of drug was computed from the respective calibration curve. All the spectral characteristics are given in table.

RESULTS AND DISCUSSION:

The optimum conditions for each methods were establish by varying one parameter at a time and keeping the others fixed and observing the effect produced and incorporated in the procedure the optical characteristics and the figures of results given in table-1, together the regression equation for the calibration products. The accuracy and precision were found by analyzing 6 replicate samples containing known amount of drug and the results were summarize in table-1.

Commercial formulations (Tablets) containing CAR were successfully analyzed by the proposed methods. The values obtained by proposed and reference (UV method) for formulations were compared statistically by t-test and f-test and found not to differ significantly as an additional check of accuracy recovery experiments

were performed by adding a fixed amount of drug to the pre analyzed formulations. These results were summarized in table-2. The ingredients present in the formulations for CAR did not interfere with the proposed analytical methods. The proposed methods were found to be simple, sensitive, accurate and can be used for the determine of CAR in the pharmaceutical dosage form in routine manner.

OPTICAL CHARACTERISTICS

Table 1

Serial No	Optical Character	Method-A	Method-B	Method-C
1	λ_{max}	265nm	286nm	286nm
2	Beer's Law Limits ($\mu\text{g/ml}$)	10-60	0.1-0.6	0.1-0.5
3	Molar Absorptivity	1.321×10^3	1.760×10^3	1.110×10^3
4	Sandell's sensitivity	0.110	0.119	0.121
5	Regression equation(Y) Slope(b) Intercept(a)	0.9998 0.000902 -0.005	0.9999 0.000921 -0.007	0.9997 0.000957 -0.008
6	%RSD	0.7571	0.8081	0.7670
7	%Range of Error	0.6320	0.6710	0.6850

- $Y=a+bX$, where X is the concentration of CAR in $\mu\text{g/ml}$ and Y is the absorbance at respective max.
- For six replicate sample.

Table 2

Sample	Labeled Amount (mp/cap)	Amount Obtained (mg)			% Recovery		
		Method-A	Method-B	Method-C	A	B	C
1	3.25mg	3.26	3.24	3.265	100.3	99.3	100.4

- Average standard deviation of six determinations the t-&F values refers to comparison of the proposed method with the reference method.
- UV method λ_{max} =
 Method A = 265nm
 Method B = 286nm
 Method C = 286nm

Figure 1: Absorption plot of CAR with DMSO

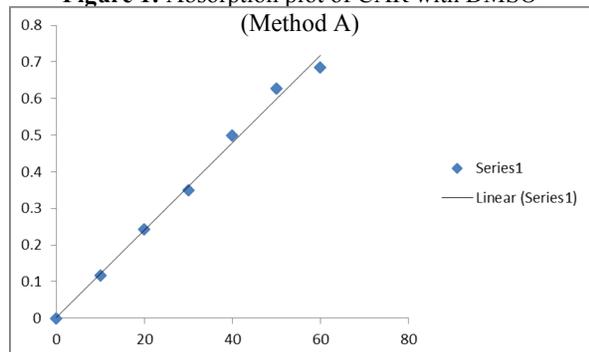


Figure 2: Absorption plot of CAR with PEG 4000 (Method B)

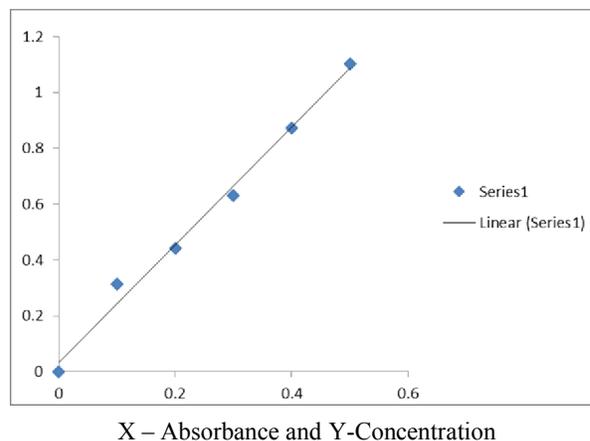
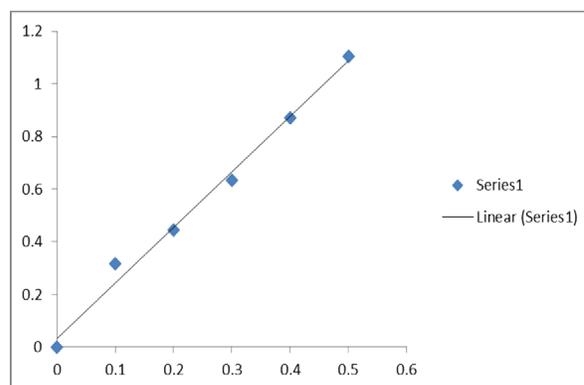


Figure 3: Absorption plot of CAR with Methanol (Method C)



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