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Simultaneous Estimation of Captopril and Hydrochlorothiazide in two Component Tablets by Ultra Violet Absorption Spectrophotometry

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A simple, rapid and economical procedure for simultaneous estimation of captopril and hydrochlorothiazide in two component tablet formulation has been developed. Captopril is quantitated utilising two wave lengths, 238 and 260 nm. A minor absorbance maxima at 322 nm of hydrochlorothiazide, where captopril had no absorbance, was used for estimation of hydrochlorothiazide. Beer Lambert's law was obeyed in the concentration ranges employed for the analysis. The results of analysis have been statistically validated and were found to be satisfactory.

CAPTOPRIL is an antihypertensive, used for treatment of hypertension and chronic congestive heart failure. Hydrochlorothiazide is a well known diuretic. Captopril is official in the U.S.P.¹. Hydrochlorothiazide is official in I.P.², B.P.³ and U.S.P.⁴. The U.S.P. describes a titrimetric method for analysis of captopril. Further literature survey revealed few HPLC⁵ and Spectrophotometric^{6,7} methods for analysis of captopril and also another HPLC⁸ method for simultaneous analysis of captopril and hydrochlorothiazide. I.P., B.P. and U.S.P. suggest a titrimetric method for analysis of hydrochlorothiazide. Other methods for estimation of hydrochlorothiazide include spectrophotometry⁹, phosphorimetry¹⁰, flu-

orimetry¹¹ and HPLC^{8,12}. Shimadzu UV-160A recording spectrophotometer was employed for this work. Stock solutions of strength 100 mcg/ml each of captopril and hydrochlorothiazide in 0.05 M NaOH were used for analysis and the two wavelengths were selected for captopril using the two wave length data processing programme in the quantitative mode of analysis of the instrument. These wave lengths were found to be 238 nm and 260 nm. Hydrochlorothiazide was determined at 322 nm, where captopril had no absorbance. The overlain spectra of captopril and hydrochlorothiazide is given in Fig. -1.

The mixed standards of captopril and hydrochlorothiazide were prepared as per the concentrations cited in Table -1. All the mixed standard solutions

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Table - 1 :
Relative Concentrations of Captopril and Hydrochlorothiazide in
mcg/ml in the seven Mixed Standards

Standard No.	1	2	3	4	5	6	7
Concentration of :							
Captopril	0	8	16	24	32	40	48
Hydrochlorothiazide	48	40	32	24	16	8	0

Table - 2
Results of Analysis of Commercial Tablets by present Method

Tablet Sample	Label Claim (mg/tab)		Found (mg/tab)		% of Label Claim	
	CP	HT	CP	HT	CP	HT
B - 1	25	25	24.59	25.04	98.36	100.16
B - 2	25	25	24.28	24.72	97.12	98.90

*Average of five readings

Tablet Sample	Standard Deviation		Coeff. of Variation (%)		Standard Error	
	CP	HT	CP	HT	CP	HT
B-1	0.738	0.936	0.767	0.934	0.423	0.540
B-2	0.976	0.496	0.982	0.502	0.563	0.286

CP = CAPTOPRIL

HT = HYDROCHLOROTHIAZIDE

were scanned at the respective λ_1 and λ_2 for captopril in the quantitative mode of the instrument. Absorbances of the same seven standard solutions were measured at 322 nm for plotting a calibration curve for estimation of hydrochlorothiazide. This curve for hydrochlorothiazide and the plot of difference in the absorbance at the two wavelengths ($\lambda_1 - \lambda_2$) against the concentration of captopril were linear in the concentration range of 0-48 mcg/ml.

Tablet sample solution of 10 mcg/ml each of captopril and hydrochlorothiazide was prepared and used for analysis. The solution obtained was an-

alysed by recording the absorbance difference at the selected two wave lengths for captopril and at the single wavelength for hydrochlorothiazide. The amount of two drugs present in the tablet sample solution was obtained using the working calibration curves plotted for the two drugs. The results obtained by repeating the estimation procedure five times with two batches of tablets were observed to have good statistical parameters (Table - 2).

The recovery studies conducted by addition of different amount of pure drug(s) to a preanalysed

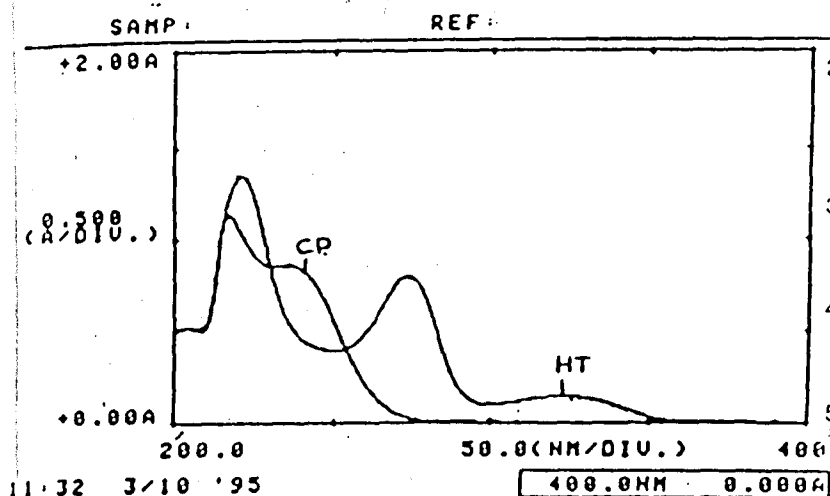


Fig. 1. Overlain Spectra of Captopril & Hydrochlorothiazide

tablet sample solution gave satisfactory recovery ranging from 98% to 103% for both the drugs.

The proposed method was found to be simple, accurate and rapid for routine simultaneous estimation of captopril and hydrochlorothiazide in tablet formulations. The values of standard deviation obtained from results of repeated analysis ranging between 0.4 to 1.0 and the recovery of added standard drugs ranging between 98% to 103% suggests satisfactory accuracy and reproducibility of the method.

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