RESEARCH PAPER

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Simultaneous Spectrophotometric Estimation of Triprolidine Hydrochloride and Pseudoephedrine Hydrochloride in Pharmaceutical dosage form

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A method for simultaneous spectrophotometric estimation of triprolidine hydrochloride and pseudoephedrine hydrochloride in combined tablet dosage form was established, based on the proportional isoabsorption point (PIP) method. The proposed method uses the absorbance at the PIP at 290 nm and at the absorbance maxima of the combined spectrum at 266 nm using 0.1 N hyrochloric acid as the solvent. The results of analysis of tablet formulation by the proposed method are in agreement with the results obtained by a reported method. The recovery studies carried out gave results between 99.6 to 100%.

TRIPROLIDINE hydrochloride (TPH), (E-2(1-pyrrolidinyl)-1-p- tolylpropenyl pyridine monohydrochloride) is an antihistamine. Pseudoephedrine hydrochloride (PEH), ((+)-threo-(1-methylaminoethyl) benzyl alcohol hydrochloride) is a sympathomimetic drug. TPH and PEH are available in combination as tablet and liquid (oral) dosage forms. Their combination in tablet dosage form contains 2.5 mg of TPH and 0 MG PEH.

Three methods for analysis of TPH and PEH in combined dosage forms have been reported[1,2,3]. But none of these are simultaneous spectrophotometric estimation methods. In two of these methods TPH is measured by spectrophotometry and PEH by titrimetry. These methods are tedious, time consuming and expensive as compared to the proposed method.

The proposed method employs the PIP and the absorbance maxima of the combined spectra for estimation of the two drugs. The PIP method is a new method based on the isoabsorption point method[1] and the absorbance ratio method[4]. The equations employed for calculations by the isoabsorption point method have been modified for application in the PIP method.

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EXPERIMENTAL

A Shimadzu UV-160A recording spectrophotometer with 10mm matched pair of silica cuvettes, was used in the present investigation.

Standards Solution

One mg of standard TPH was dissolved in 0.1 N hydrochloric acid and the volume made upto 100 ml in a 100 ml. volumetric flask, to obtain a standard solution of strength 10 mcg/ml of TPH. Similarly a standard solution of PEH containing 500 mcg/ml of PEH was prepared. Beer's law is obeyed in the range of 5 mcg/ml to 70 mg/ml by TPH and 250 mcg/ml to 3500 mcg/ml by PEH.

Tablet Sample Solution

Twenty tablets were powdered and powder equivalent to the average tablet weight was transferred to a 50 ml volumentric flask. Volume was

Table - 1: Absorbance data for TPH and PEH

Wavelength (nm)	Absorbance	
	TPH	PEH
290	0.292	0.009
266	0.220	0.220
	Absorptivity	
266	22	0.44

K1 = 0.292/0.220 = 1.3272

K2 = 0.009/0.220 = 0.0409

made upto 50 ml with distilled water and the solution was filtered. 10 ml of the filterate was transferred to a 50 ml volumentric flask and 5 ml of 1N hydrochloric acid was added to it. Volume was made upto the mark with distilled water.

METHOD

TPH and PEH do not show an isoabsorption point as far as the definition of isoabsorption point is concerned. So, TPH and PEH are taken in different concentrations (TPH : PEH = 1:50), to obtain an proportional isoabsorption point (PIP) at 247.5 nm and 266 nm. For quantitation of the two drugs, the PIP at 266 nm, is employed, alongwith the absorbance maxima at 290 nm. For all the standard and tablet sample solutions absorbance is measured at 266 nm and 290 nm to obtain data for calculations as per equations given below. Absorbance of standard solutions of TPH and PEH at the two wavelengths and absorptivity of the two drugs at 266 nm are tabulated in **Table-1.**

$$C1 = \frac{KO-K2}{K1-K2} \times \frac{Ap}{a1} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$C2 = \frac{KO-K1}{K2-K1} \times \frac{Ap}{a2} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where C1 and C2 = concentrations of TPH & PEH respectively in the sample.

KO = ratio of absorbance at 290 nm and 266 nm (λ max/PIP), of the sample.

K1 & K2 = ratio of absorbance at 290 nm and 266 (λ max/PIP for TPH and PEH respectively.

Ap = absorbance of the sample at PIP.

a1 and a2 = absorptivities of TPH and PEH respectively at the PIP.

On simplification using the values from table-1 the equations (I) and (II) can be written as -

$$C1 = \frac{A(290\ nm) - 0.04 \times A(266\ nm \times 10^{3} mcg/ml}{28.292} \quad (III)$$

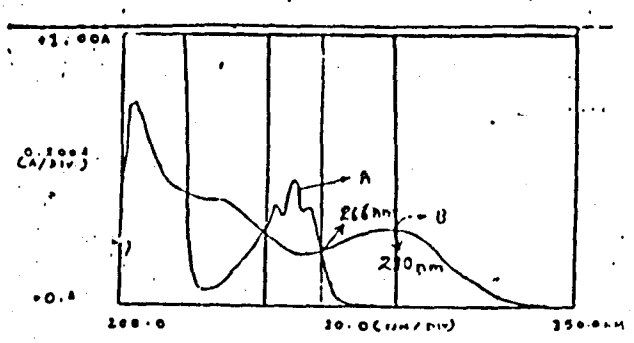
$$C2 = \frac{A(290\ nm) - 1.327 \times A(266\ nm \times 10^{3} mcg/ml}{-0.56584} \quad (IV)$$

Results of tablet analysis by the proposed method any by a reported method[1] are given in **Table-2.** Recovery studies were carried out by adding known amounts of standard drugs to a pre-analysed tablet sample and analysing the resultant by the proposed method. Recovery was found to be between 99.6 to 100%.

TABLE - 2: Tablet Analysis Data

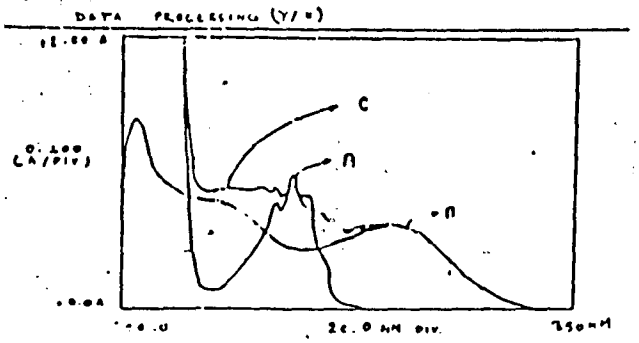
Drug	Amount obtained	
	Proposed Method	Reported method
TPH	99.2%	99.2%
PEH	99.2%	99.2%

Ultraviolet Absorption Spectra of triprolidine hydrochloride (10 mcg/ml) and Pseudophedrine Hydrochloride (50 mcg/ml)



A = PSEUDOEPHEDRINE HYDROCHLORIDE
B= TRIPROLIDINE HYDROCHLORIDE

Ultraviolet absorption spectra of triprolidine hydrochloride (10 mcg/ml) and pseudoephedrine hydrochloride (50 mcg/ml) & Tablet sample solution.



A = PSEUDOEPHEDRINE HYDROCHLORIDE
B= TRIPROLIDINE HYDROCHLORIDE
C=TABLET SAMPLE

RESULTS AND DISCUSSION

The proposed method employs the proportional isoabsorption point for simultaneous analysis of TPH and PEH. This method is a new method, which employs the principle involved in using the isoabsorption point method and the graphical absorbance ratio method for simultaneous analysis.

The method gives very impressive results with deviations of less than ± 0.5%. The recovery study data and the tablet analysis data indicate the accuracy and reproducibility of the method. The method is also very economical as it requires only hydrochloric acid in addition to the pure drug samples and the instrument. All this data suggests the suitability of the proposed method for routine analysis of formulations containing TPH and PEH.

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