METHOD DEVELOPMENT AND VALIDATION OF DORAVIRINE IN BULK AND PHARMACEUTICAL DOSAGE FORM BY USING UV SPECTROPHOTOMETER

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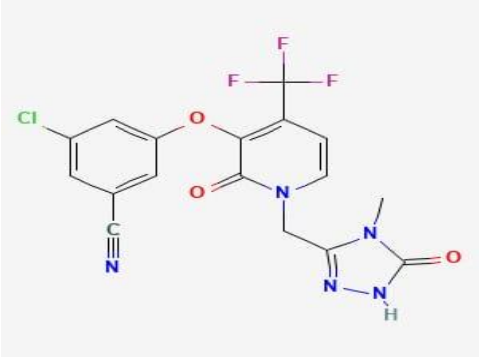
Abstract

A simple, rapid, precise, sensitive and reproducible UV method has been developed for the analysis of doravirine in pharmaceutical dosage from absorption of doravirine was achieved on UV 1700 using UV visible detector with a software of UV probe. The percentage of relative standard deviation of absorbance of all measurements always less than 2.0. The proposed method was validated according to ICH guidelines. The method was found to be simple, economical, suitable, precise, accurate and robust method for the quantitative analysis of Doravirine

Key words: UV- 1700, Doravirine, absorbance, standard deviationt, validation.

Introduction

Structure of doravirine:-



IUPAC name :-

3-Chloro-5-({1-[(4-methyl-5-oxo-4,5-dihydro-1H-1,2,4-triazol-3-yl)methyl]-2-oxo-4-(trifluoromethyl)-1,2-dihydro-3-pyridinyl}oxy)benzonitrile

Molecular formula:- C17H11ClF3N5O3

Molecular weight:- 425.7

Solubility: -

Doravirine is soluble in the organic solvent DMSO. Doravirine is slightly soluble in methanol.

Doravirine is in a class of medications called non-nucleoside reverse transcriptase inhibitors (NNRTIs)[1]. It works by decreasing the amount of HIV in the blood.This drug is used with other HIV medications to help control HIV infection[2]. It helps to decrease the amount of HIV in your body.This lowers the chance of getting HIV complications and improves your quality of life[3].It belong to a class of drug known as non- nucleoside reverse transcriptance inhibitors (NNRTs). It is not a cure for HIV infection to decrease risk of spreading HIV disease to others[4].

Experimentation

Instrument Details

company : shimadzu
model No. : uv – 1700 series

software : uv probe

PARAMETERS - METHOD

Diluent. - Methanol
Wavelength. - 200nm- 400nm

Materials and methods

All of the chemicals reagents utilised were of excellent quality and purity, and were obtained from a variety of sources. Shimadzu of model number UV 1700 series, software UV probe ,

Standard preparation:

A clean empty butter paper is taken in a analytical balance, accurately weighted 5 mg of doravirine and transferred into 10 ml of volumetric flask the volume of the solution is made upto the mark by using diluent (methanol). The stopper is inserted firmly. This volumetric flask is kept into the ultrasonicator[5] for further dilution. After 2 min this volumetric flask is taken out and made upto the mark. Pipette out 1 ml from the solution and made upto the mark

preparation of sample: A clean empty butter paper is taken in a balance, individual sample should be weighed.Then the weight of the sample can be taken by the average of all samples
523mg(t)----- 100mg (LC)
=523×5/100
= 2.615/100
=26.15~26mg
Take out one sample & grind it into powder. 26 mg of sample weighed accurately in a analytical balance and it transferred into 10ml volumetric flask. few drops of methanol is added and it should be kept in the ultrasonicator for 30min. then take out flask and made upto mark . This is stock solution. for dilution pipette out 1ml from stock and made upto the mark with methanol.

Specificity:

The injunction of a blank was used to test specificity.It was done to see if there were any contaminats interfering with the retention of the analytical peak. there are no contaminats that effects the retention time of analytical peak.

System precision:

System precision is checked by using standard chemical substances to ensure analytical system is working properly. All the system suitability parameters were within the range and satisfactory as for ICH guidelines

Accepted criteria: The % RSD for the method precision should not more than 2.

Linearity:

Accurately weigh and transfer 5.0 mg of doravirine working standard into a 10 ml clean & dry volumetric flask . Add diluent and sonicate to dissolve it completely and make upto the mark with same diluent

Assay :

Acceptance criteria :

% of assay- 98-102%

METHOD PRECISION:

precision of a method is the degree of agreement among individual test results when the procedure is applied repeatedly to multiple sampling

Acceptance criteria:

% of RSD less than 2

% of assay- 98-102%

ROBUSTNESS:

Robustness is a method was determined by carrying out the analysis at 2 different wavelengths ± 5 nm**.** The respective absorbance well noted and The results were indicated by% RSD . The % value were found to be with in the acceptance criteria.

Acceptance criteria:

% of RSD less than 2

INTERMEDIATE PRECISION: Intermediate precision refers to the agreement between the results from within- laboratory variations due to random events that might occur when using the method, such as different days, analysts, or equipment.

Acceptance criteria:

% of RSD less than 2

Results

Table-1

SYSTEM PRECISION	ABSORBANCE	% OF RSD
1. STD -1	1.158	0.265 %
2. STD -2	1.153	
3. STD -3	1.155	
4. STD -4	1.152	
5.STD - 5	1.150	
6.STD - 6	1.157	

Table-2

LINEARITY	CONCENTRATION	ABSORBANCE
1. LINEARITY -1	12.50	0.268
2. LINEARITY-2	25	0.571
3. LINEARITY-3	37.5	0.842
4. LINEARITY-4	50	1.147
5. LINEARITY-5	62.5	1.412
6. LINEARITY-6	75	1.638
REGRESSION EQUATION	Y=0.02x+0.01	
SLOPE	0.02	
INTRESEPTOR	0.01	
R^2	0.999	

Assay

Table-3

S.No	Absorbance
1	1.142
2	1.151

Table-4

METHOD PRECISION	ABSORBANCE	%OF ASSAY
1.METHOD PRECISION -1	1.142	98%
2.METHOD PRECISION-2	1.151	99%
3.METHOD PRECISION-3	1.148	99%
4.METHOD PRECISION-4	1.149	99%
5.METHOD PRECISION-5	1.154	100%
6.METHOD PRECISION-6	1.139	98%
MEAN	1.1471	99.39%
STANDARD DEVIATION	0.005636	
% OF RSD	0.491326	

Table-5

Robustness change	Concentration	% of Assay
235	50ppm	99%
225	50ppm	100%

Table-6

INTERMEDIATE PRECISION	ABSORBANCE	% OF ASSAY
1.INTERMEDIATE PRECISION -1	1.149	99%
2.INTERMEDIATE PRECISION -2	1.138	98%
3.INTERMEDIATE PRECISION -3	1.160	100%
4.INTERMEDIATE PRECISION-4	1.154	100%
5.INTERMEDIATE PRECISION -5	1.157	100%

6.INTERMEDIATE PRECISION -6	1.143	99%
MEAN	1.1501	100%
STD DEVIATION	0.008472	
% OF RSD	O.7365	

An attempt has been made of develop a validated stabilizing indicating UV method for the estimation of doravirine.Literature survey revealed that many analytical methods have been repated individual (or) in combination with other drug.It gives the general information on topic and method development and also gives the general information on Specificity,System precision,intermediate precision,Method precision,Assay,Roboustness.Good linearity Results for the recoveries of selected drugs were found to the within the Limits 98-102%). The proposed U.V method was accurate for the analysis.

The developed uv method for the estimation at doravirine is simple rapid accurate precision Robustness and economical The mobile phase and solvents are simple to prepare .It explains in detail the previous contracture available for drug used for developed research work.It include stability Indicating uv method development and validation for estimation of doravirine in bulk and their pharmaceutical dosage form using UV spectrophotometer. The wavelength detected by uv detector at 230nm. The absorbance was 1.131

In this proposed uv method for the selected drugs showed good linearity. Results for the recoveries of selected drugs were found to the within the limits.This indicate that the proposed method was accurate for the analysis.

Conclusion

The developed uv method for the estimation of doravirine simple, rapid, accurate precision, roboustness, economical. The solvents are simple to prepare and aconomical reliable sensitive and less time consuming

The sample recoveries were in good agreement. With their label claims and we suggested noninterference of formulation rei-excipicats in the estimation and can be used in laboratories For the routine analysis of doravirine. Since the system validation parameters of uv method used for the estimation of doravirine in pure and have shown satisfactory accurate and reproducible results (without any of sxcipiants) as well. it is deduced that the short-proposed method useful for analysis purpose

The present work concluded that stability indicating assay by uv method was simple, accurate precise, and specific.It has no interference with the placebo present in formulation.Hence this method can be used for routine analysis for doravirine .

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