



ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF DONEPEZIL HCL IN THE PRESENCE OF ITS RELATED COMPOUNDS BY RP - HPLC

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ABSTRACT:

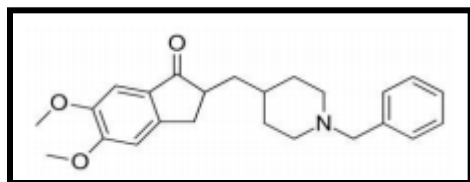
A simple, precise, & accurate Rp – HPLC method has been developed & validated for the related compounds of Donepezil Hydrochloride in pellets formation. An gradient separation was achieved using primesil - C18 (150x 4.6mm, 3 μ) column with a flow rate of 1ml / min & photo diode array detector at 230nm. The mobile phase is composed of Acetonitrile, water and perchloric acid in the ratio of 300 : 600 :1 with a column oven temperature of 35 $^{\circ}$ C. The diluent is composed of methanol and 0.1N HCL in ratio of 3:1 ratio. the method was validated for specificity, linearity, precision, accuracy & robustness. The method was found to be robust & suitable for the quantitative analysis of related substance in a pellet formation. The method is useful for the determination of following impurities Desbenzyl Donepezil and Donepezil NOxide

KEYWORDS:

RP – HPLC, DONEPEZIL HYDROCHLORIDE, ACETONITRILE, DESBENZYL DONEPEZIL AND DONEPEZIL N-OXIDE.

INTRODUCTION:

Donepezil Hydrochloride is the hydrochloride salt of a piperidine derivative with neurocognitive enhancing activity. Donepezil reversibly inhibits acetylcholinesterase, there by blocking the hydrolysis of the neurotransmitter acetylcholine and, consequently, increasing its activity. This agent may improve neurocognitive function in Alzheimer's disease, reduce sedation associated with opioid treatment of cancer pain, improve neurocognitive function in patients who have received radiation therapy for primary brain tumours or brain metastases.



STRUCTURE OF DONEPEZIL HCL

MATERIAL:

CHEMICALS:

**TABLE.1 LIST OF CHEMICALS, BRAND, BATCH NO,
INSTRUMENTS, MAKE AND MODEL.**

S.NO	CHEMICALS	BRAND	BATCH NO.
1.	1- Decare sulfonic and sodium salt	FISHER SCIENTIF IC	2452111217
2.	ACN	MERCK	SH8SA81308
3.	HClO ₄	MERCK	AD3A630202
4.	0.1 NHCL	MERCK	CK8C680823
5.	H ₂ O		

EQUIPMENTS:

S.NO	INSTRUMENTS	MAKE	MODEL
1.	Analytical Balance Min-100mg Max- 120000mg	SARTORUS	SECURA 2250-101N
2.	PH Meter	THERMO SCIENTIFIC	ORION STAR A211
3.	HPLC	SHIMADZU	2010CHT
4.	0.1 N HCL	BRANSON	8800

CHROMATOGRAPHIC PARAMETERS:

An gradient separation was achieved using primesil -C18 (150x 4.6mm, 3 μ) column with a flow rate of 1ml / min & photo diode array detector at 230nm. The mobile phase is composed of Acetonitrile, water and perchloric acid in the ratio of 300 : 600 :1 with a column oven temperature of 35 $^{\circ}$ C.

DILUENT:

Diluent was prepared by mixing water and ACN in the ratio of 3:1.

The run time was 15min, the λ max was 230nm.

PREPARATION OF STANDARD SOLUTION:

STANDARD STOCK:

Weigh and then transfer about 10mg of Donepezil HCL working standard / reference std into 100 volumetric flask and then add 35ml of diluent & sonicate to dissolve & make upto the mark with diluent.

DILUTED OF STANDARD PREPARATION:

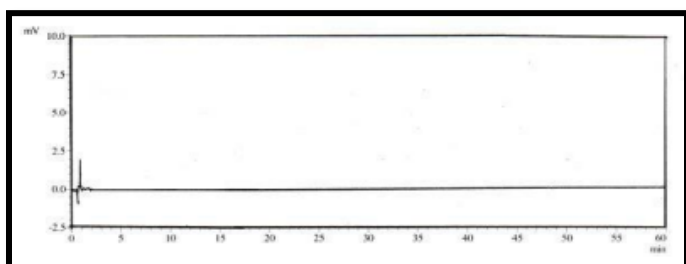
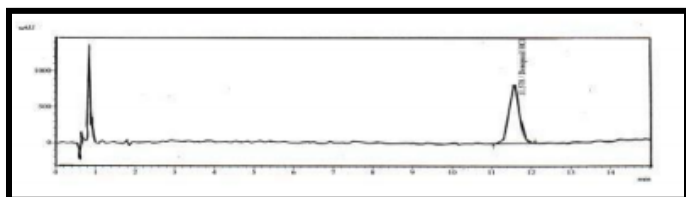
Further dilute 0.5ml of the above solution into a 50ml volumetric flask & dilute to volume with diluent. Then inject into HPLC.

PREPARATION OF TEST SOLUTION:

Transfer the pellets equivalent to about 50mg of Donepezil HCL into a 100ml vf and add 70ml of diluent, sonicate for 30 min with intermittent shaking & dilute to volume with diluent & filter the solution through 0.45 μ m PVDF membrane filter & inject the filter to HPLC.

RESULTS & DISCUSSIONS:**METHOD DEVELOPMENT:**

The method development was initiated in isocratic mode of HPLC with an initial composition of mobile phase using water and Acetonitrile in the ratio of 3 : 1 % v/v using different columns, based upon trails mobile phase consisted of ACN : H₂O : HClO₄ in the ratio of (300 : 600 : 1 % v/v), using Primesil, C18 (150x4.6mm 3 μ), column was finalized for the evaluation of related compounds in Donepezil HCL pellets. The blank and standard solution chromatography were represented in fig 1 & 2 system suitability parameters were summarized in table – 2.

**FIG .1 BLANK SOLUTION****FIG.2 STANDARD SOLUTION****TABLE 2 SYSTEM SUITABILITY PARAMETERS****REFERENCES**

No reference, since the present article is an outcome of Creative Writing.