

Spectrophotometric assay of cefuroxime and cefixime: A review

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Abstract

Cefuroxime and cefixime are the most generally specified cephalosporin antibiotics. Possibly, spectrophotometry is the most suitable analytical mode for red tape analysis, on account of its least cost, ingrained simplicity and quality control laboratories are broad available. Various articles have been offered in last years related the evolution and validity for spectrophotometry mods for analysis of cefuroxime and cefixime in dosage forms and biological fluids. In this review manuscript, different spectrophotometric mods for analysis of cefuroxime and cefixime are offered. The focus of study of analysis of cefuroxime and cefixime in dosage forms and biological fluids are useful for the determination of various cephalosporin for budding researchers.

Keywords: Cefuroxime; Cefixime; Spectrophotometry; Assay; Review

1. Introduction

Cefuroxime is a second generation cephalosporin first commercially available to be widely used in therapy [1]. Its chemical structure appeared in figure 1 [2].

Cefuroxime is a broad spectrum, semi synthetic cephalosporin antibiotics which is administered for treatment diversity of bacterial infections like chronic bronchitis, case of pharyngitis and urinary tract infection as well as uncomplicated. The process of action of cefuroxime versus the bacteria is onto prevent the bacterial wall synthesis [3].

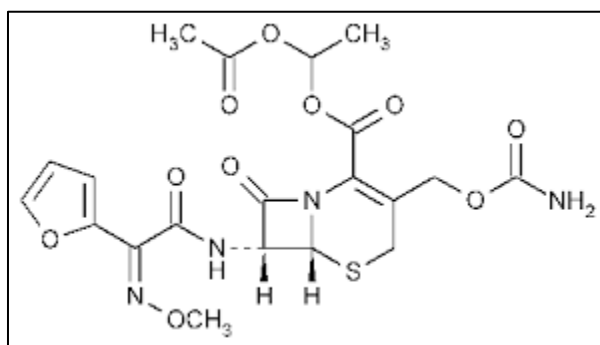


Figure 1 Cefuroxime structure.

Cefixime is a third generation cephalosporin antibiotic. Its chemical structure showing in Figure 2 [2].

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Cefixime is a broad-spectrum antibiotic [4]. It is under the category of β -Lactam Antibiotics/Cell Wall inhibitor. It is utilized in minimize respiratory tract infections. Cefixime is also beneficial in acute urinary and biliary tract infections, peptic ulcer, acute otitis media, sinusitis and many more [2,5].

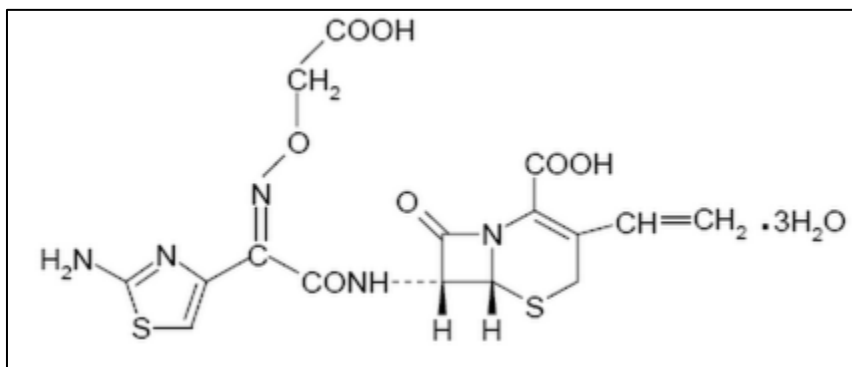


Figure 2 Cefixime structure

1.1. Spectrophotometric assay of drugs

One of greatest beneficial tools attackable to the chemist for quantitative analysis is absorption spectrophotometry. This is because that it has broad-ranging applicable, fantastic sensitivity and moderate to high selectivity, ideal accuracy and suitability besides simplicity. Colorimetric methods can modify a drug selectively, thus the spectrum is shifted to the visible region and out of the way from influence of interfering, thus gathering a extra degree of specialty [6].

1.2. Spectrophotometric assay of cefuroxime

In the last years, the employ of spectrophotometric modes were beneficial in the assay of cefuroxime together with various reagents. A study of the literature reminded numerous spectrophotometric modes for assay of cefuroxime utilizing different reagents as listed in Table 1.

Table 1 Several spectrophotometric assay of cefuroxime.

NO.	Chemicals	λ_{max} (nm)	Linear range ($\mu\text{g}.\text{ml}^{-1}$)	Ref.
1	o-phenanthroline	510	100.0 - 300.0	1
2	bromothymol blue	410	1.021-25.524	3
3	acetonitrile	277	1.0-35.0	7
4	ZnSO ₄ .7H ₂ O, MnSO ₄ , FeSO ₄ , and Co(NO ₃) ₂ .	278	-	8
5	potassium dichromate	520	0.2-28.0	9
6	Hydrochloric acid	281	0.4 - 2.0	10
7	1-nitroso-2-naphthol and sodium hydroxide	424	10.0-50.0	11
8	nitrous acid	350	0.2 - 6.0	12
	hypobromite with sodium fluorescein	517	0.2 - 3.2	
	o-phenanthroline	509	0.1 - 5.6	
9	methanol	281	2.0-25.0	13
10	methanol	277	5.0-25.0	14
	MBTH	624	1.0-5.0	
	PDAC	537	2.0-10.0	
11	CdCl ₂ .2 / ² H ₂ O	289	10.0-30.0	15
	ZnCl ₂ .2H ₂ O	290	10.0-30.0	

1.3. Spectrophotometric assay of cefixime

The number of peer reviewed literatures was surveyed for the spectrophotometric assay of cefixime. The literature survey revealed that various methods of analysis for cefixime alone or in combination with other drug have been reported, Reported spectrophotometric for determination of cefixime in pharmaceutical formulation are listed in Table 2.

Table 2 Some spectrophotometric assay of cefixime.

NO.	Chemicals	λ_{max} (nm)	Linear range ($\mu\text{g.ml}^{-1}$)	Ref.
1	Hydrochloric acid	283 and 303	8-16	5
2	$\text{CdCl}_2 \cdot 2/2 \text{H}_2\text{O}$ $\text{ZnCl}_2 \cdot 2\text{H}_2\text{O}$	294 291	10.0-30.0 10.0-30.0	15
3	2-hydroxypropyl- β -cyclodextrin	274 282	5.0-100.0 1.0-15.0	16
4	Copper chloride dihydrate	546	0.453-9.069	17
5	α -Naphthol	412	1.0-20.0	18
6	methanol	222 and 250 215 and 228 250	1.0-20.0	19
7	4-dimethylamino benzaldehyde	393	5.0-25.0	20
8	palladium chloride	352	2.5-35.0	21
9	potassium iodide and potassium iodate	352	4.0-24.0	22
10	ortho nitro phenol	400	10.0-160.0	23
11	1,2-naphthoquinone-4-sulfonic	521	0.5-3.0	24

2. Conclusion

In this review analysis of Cefuroxime and Cefixime by spectrophotometric techniques are existing. Some of the mentioned techniques are visible spectrophotometric modes and some others are ultraviolet spectrophotometry. So that these modes can be proposed for the routine assay of Cefuroxime and Cefixime and they may be effectively utilized for the determination of Cefuroxime and Cefixime in dosage forms and biological fluids .

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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