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FT-IR SPECTROPHOTOMETRIC ANALYSIS OF OCTENIDINE DIHYDROCHLORIDE AND ITS PHARMACEUTICAL FORMULATIONS.

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ABSTRACT

A Fourier transform infrared (FT-IR) spectrometric method was developed for the rapid, direct measurement of Octenidine Dihydrochloride in different pharmaceutical products. Infrared spectrometry (IR) provides a useful way for the identification of drugs. However, the traditional techniques employed to obtain the IR spectra, such as alkali halides disks, mulls and thin films, are sometimes not adequate for quantitative analysis. Fourier Transform (FT-IR) permits continuous monitoring of the spectral baseline and simultaneous analysis of different component of the same sample.

KEYWORDS: Octenidine Dihydrochloride, FT-IR analysis.

INTRODUCTION

Octenidine dihydrochloride is a cation-active compound and as a result of its two cationic centers possesses marked surface-active properties.[1] It reacts with cell wall and membrane components of the microbial cell and thus leads to destruction of cell function.[2] The mechanism of antimicrobial action of phenoxyethanol is based, among other effects, on an increased permeability of the cellular membrane for potassium ions.[3] Whatever the type of microbial cell (or entity), it is probable that there is a common sequence of events.[4] This can be envisaged as interaction of the antiseptic or disinfectant with the cell surface followed by penetration into the cell and action at the target site(s). The nature and composition of the surface vary from one cell type (or entity) to another but can also alter as a result of changes in the environment. Interaction at the cell surface can produce a significant

effect on viability (e.g. with glutaraldehyde), but most antimicrobial agents appear to be active intracellularly.[5] The outermost layers of microbial cells can thus have a significant effect on their susceptibility (or insusceptibility) to antiseptics and disinfectants; it is disappointing how little is known about the passage of these antimicrobial agents into different types of microorganisms. Potentiation of activity of most biocides may be achieved by the use of various additives.[6]

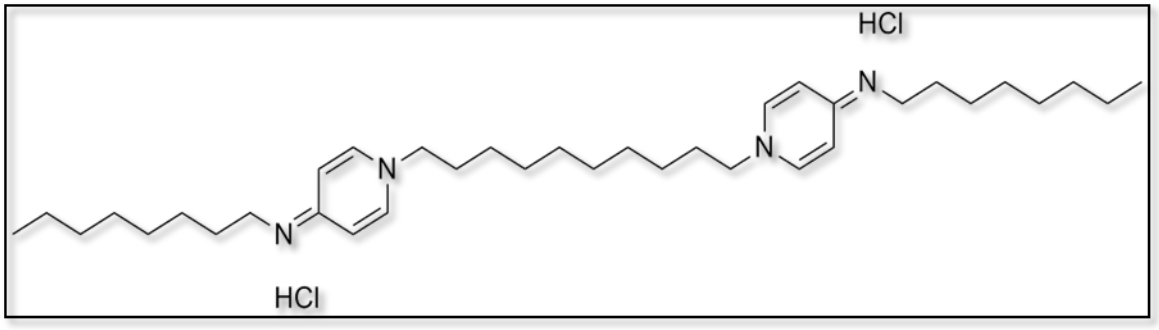


Fig.No.1: Octenidine Dihydrochloride[7]

The determination of the major components in drugs with FT-IR spectrometry provides an enormous amount of spectroscopic information of a sample.[8] The purpose of the present study is to investigate the potential of FT-IR spectrometry to quantify Octenidine Dihydrochloride in pharmaceutical preparations.[9]

Experimental

1) Apparatus

FTIR Spectrophotometer (Agilent FTIR Cary 630) Data acquisition was performed using a Spectrum100 Systems FT-IR spectrometer equipped with Spectrum for Windows v.5.01. The commercial softwares used to generate analysis.

2) Reagents and materials

- Octenidine Dihydrochloride was provided by Disham Pharmaceutical & Chemicals Pvt. Ltd. Ahamadabad, Gujarat.
- Octenisept wound solution containing 500 ml were obtained from local market. All chemical and reagents used were of analytical grade.

3) Procedure

The FT-IR spectrum of the sample of drug were taken and compared with the standard FT-IR spectra of the pure drug. The infrared absorbance spectrum of Octenidine Dihydrochloride

was recorded using a Brukar FT-IR Spectrophotometer over the range of 600 –4000 cm-1 at a resolution of 4 cm-1.

REULTS AND DISSCUSION

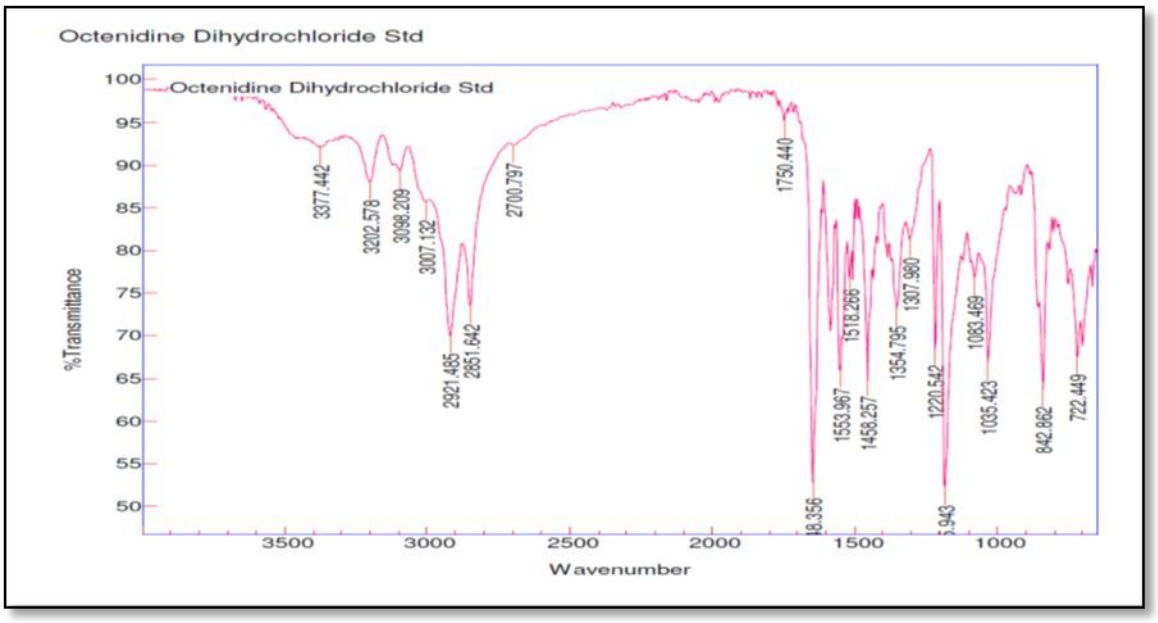


Figure No.2: IR spectra of Octenidine Dihydrochloride.

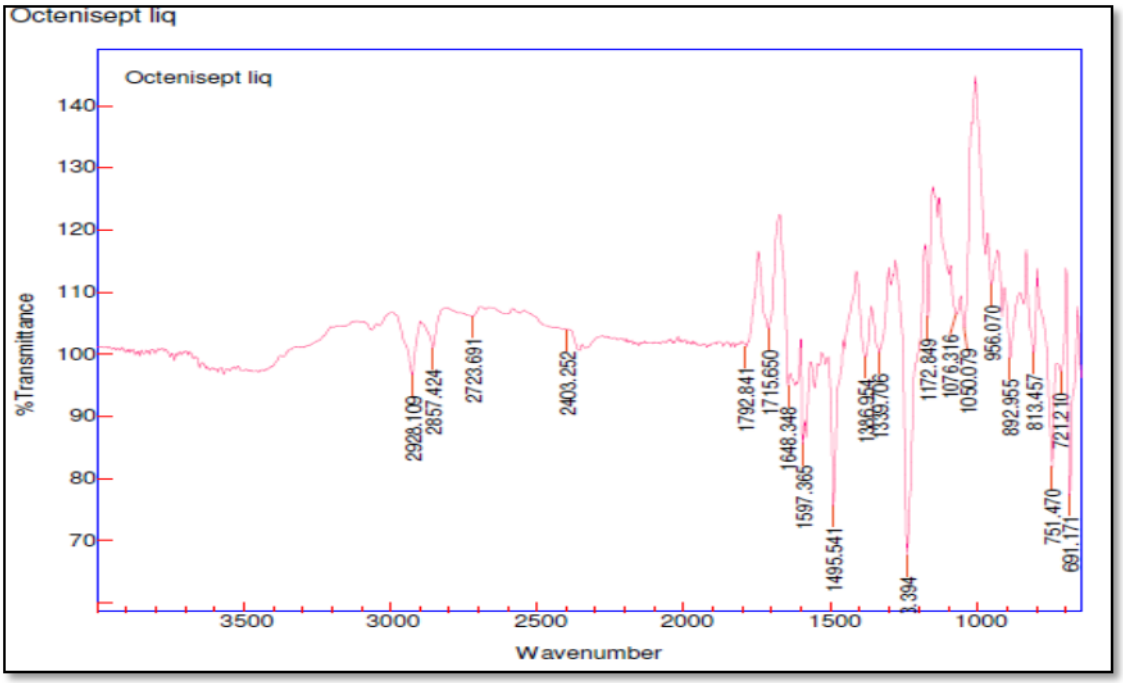
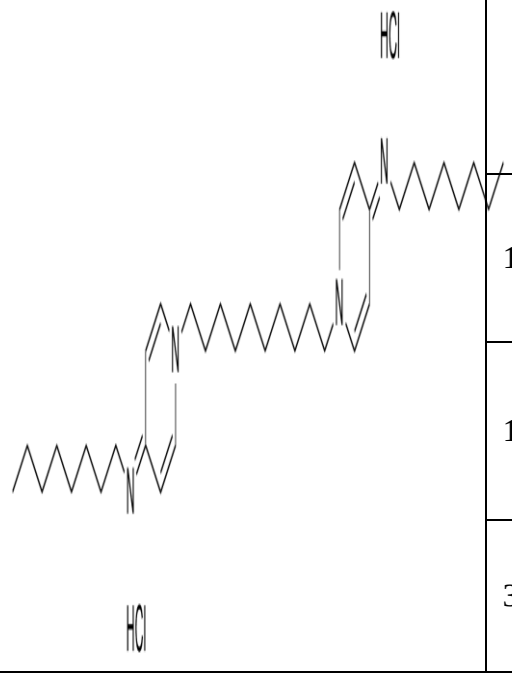


Figure No.3: IR spectra of Octenidine Dihydrochloride.

Table No. 4: Recorded characteristic peaks of FT-IR spectrum of Octenidine Dihydrochloride.

Sr. No.	Structure	Literature value (cm^{-1})	Observed value (cm^{-1})	Inference
1.		800-600	722.449	C –X
2.		1690-1640	1648.356	C = N Aromatic
3.		1350-1000	1220.542	C-N Aromatic
4		3500-3100	3377.442	N – H Stretch

FT-IR Spectroscopy of Octenidine Dihydrochloride, FTIR spectrum of Octenidine Dihydrochloride complies with its chemical structure N,N- (decane – 1 ,10 - diyldipyridin – 1 – yl – 4 – ylidene) dioctan -1- amine dihydrochloride since the characteristic bands for functions such as -NH, -CH, C-Cl, Ar C-N was observed.

CONCLUSION

It is clear that FT-IR spectrometry is capable of direct determination of Octenidine Di hydrochloride in several formulations. With the commercial software involving chemometric approaches, the method proposed is simple, precise and not time-consuming compared to the chromatographic methods that exist in literature. Quantification could be done in about 5-10 minutes, including sample preparation and spectral acquisition.

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