

INFRA RED SPECTROSCOPY AS TOOL FOR PHARMACEUTICAL QUALITY ASSURANCE

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ABSTRACT

In pharmaceutical science IR spectroscopy has emerged as a powerful analytical Technique. This paper delineates IR including both FTIR and NIR as a Quantitative tool used now-a-days and some Qualitative applications of IR spectroscopy. This paper involves how IR is used for quantification of different pharmaceutical dosage Form. Associated with chemometrics, FTIR becomes a powerful tool for the pharmaceutical industry.

INTRODUCTION

IR spectroscopy is used for Identification of organic substance with another one. If two samples have identical spectra under same conditions of measurement. It must be the sample of similar substance. Conditions which involves are physical state of the samples, concentrations of solutions and the solvents used. The characteristic IR absorption region of some important bands is available like alkenes, aldehydes, ethers, aromatic compounds, ketenes, alkynes, alcohols and amines.

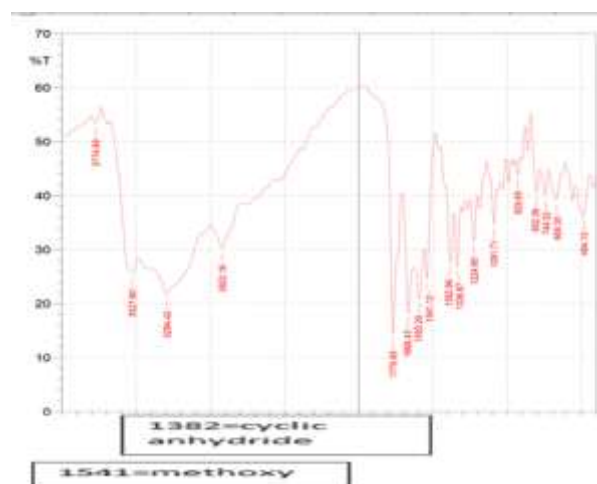
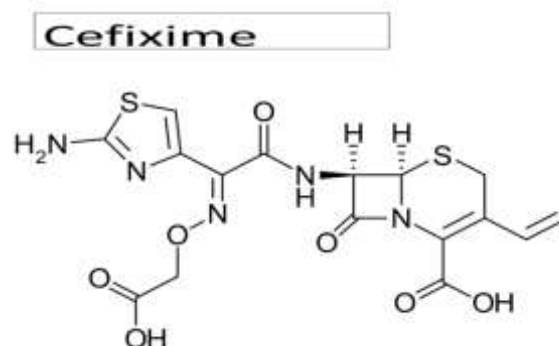
Determination of molecular structure

IR spectroscopy is useful in determining molecular structure of unknown substances. By examining the positions of absorption bands in the spectra, the establishment of nature of groups present in the molecules is done.

In Pharmaceutical Industry

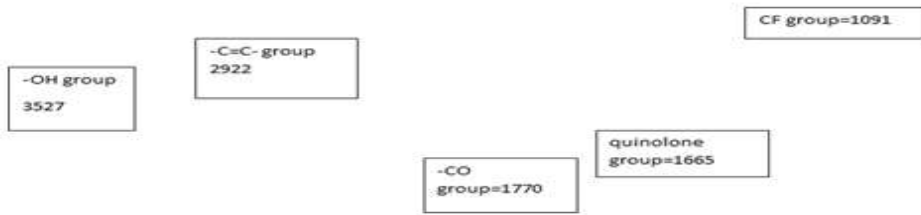
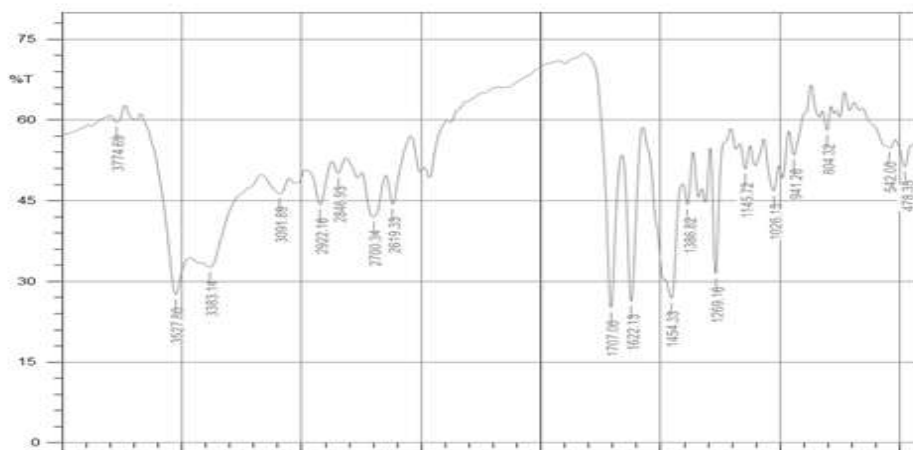
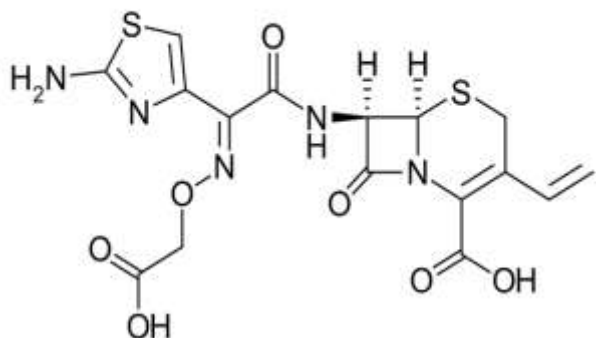
IR spectroscopy can be used to determine impurities in raw material. It is also used for the Identification of materials made by competitors. It can be useful for quality control for checking the composition and the percent present of the product.

In this study IR spectrum of 5 antibiotics and one anticancer drug were obtained and proposed for pharmaceutical industry quality assurance department.



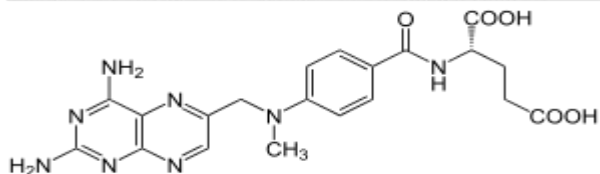
In cefixime antibiotic, its cyclic anhydride ring was found at 1382 and its methoxy group was found at 1541.

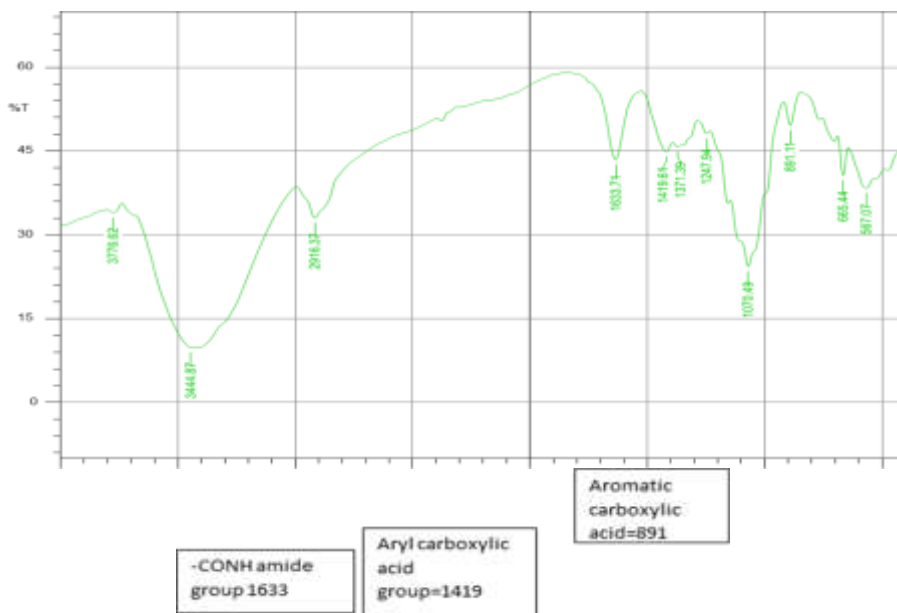
Cefixime



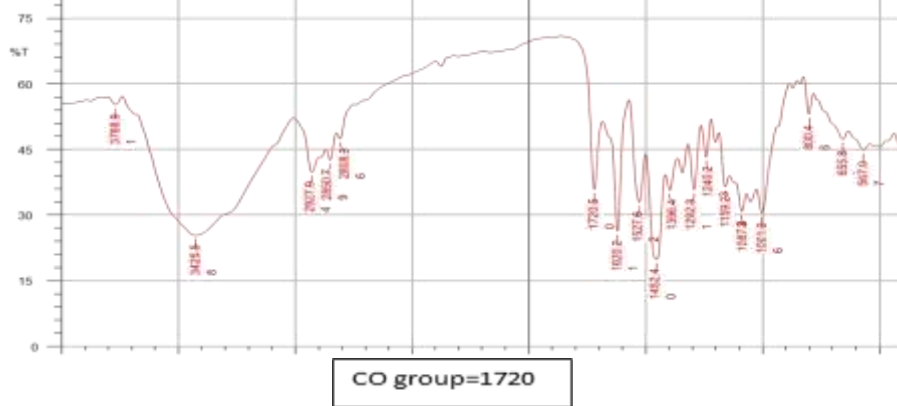
In ciprofloxacin antibiotic, -OH functional group was found at 3527, -C=C- was found at 2922, -CO functional group was found at 1770, quinolone functional group was found at 1665, \equiv CF functional group at 1091.

Methotrexate

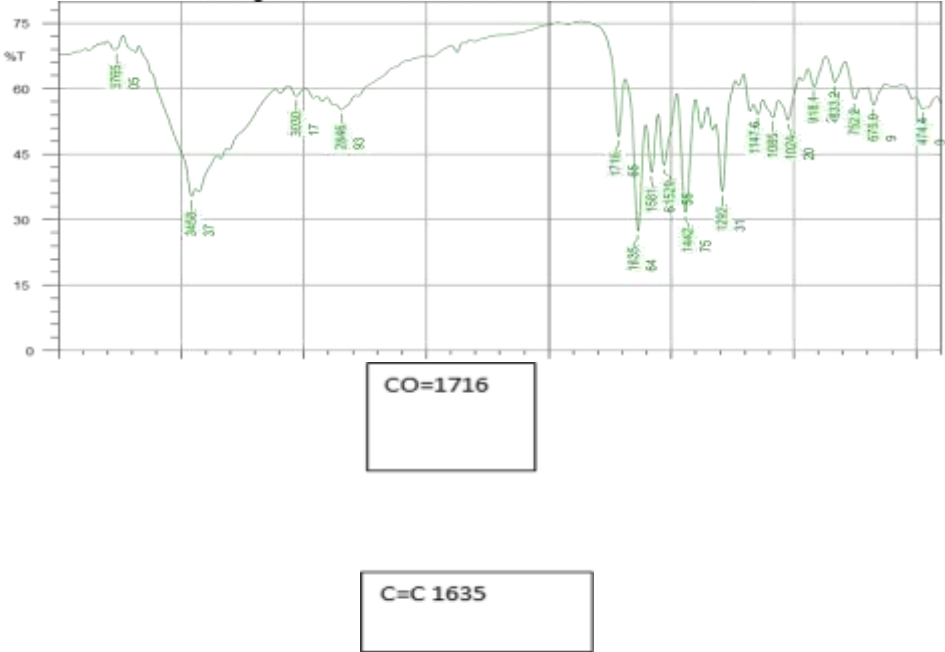


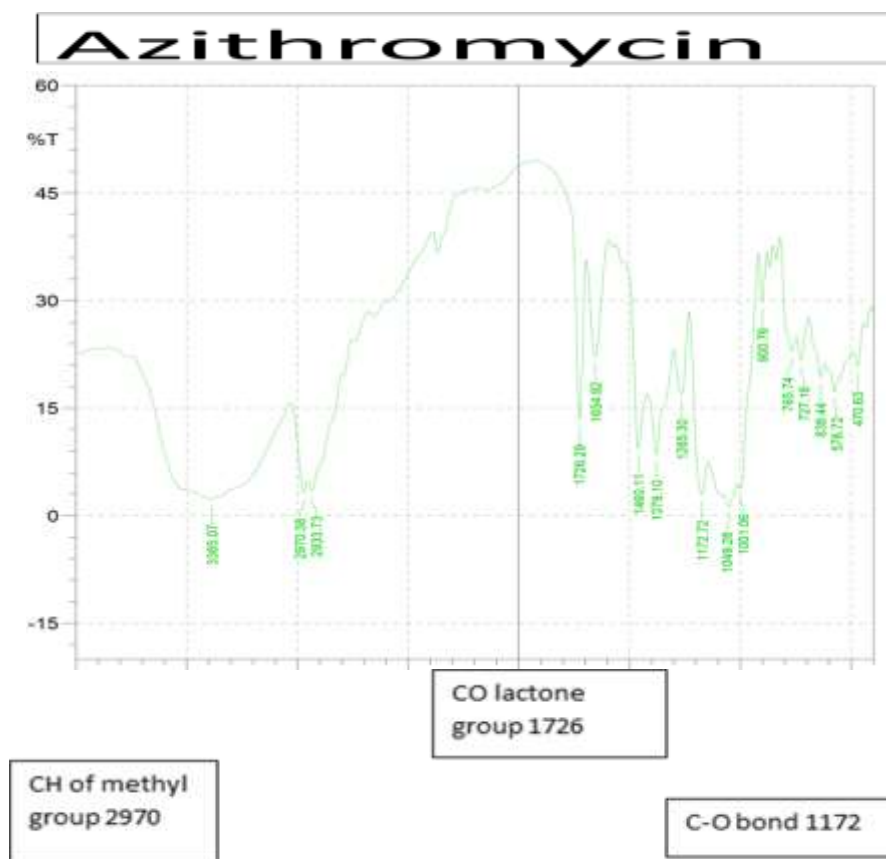


Levofloxacin



Sparfloxacin





RESULT

Every functional group came within Encyclopedia of Infrared Spectroscopy: Volume III reference. Hence infrared spectroscopy is a rapid and cheap way to find identity of a molecule.