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Characterization and Quantitative Assessment of Antibiotic Cefixime Drug Using Raman and Time-domain Terahertz Spectroscopy *

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This paper reports the use of Raman and time-domain terahertz spectroscopy to ascertain the potential of antibiotic Cefixime drug which is widely used for curing bacterial infections and obtained from different pharmaceuticals companies. The indigenously designed terahertz spectrometer between 0.1–2.8 THz range was employed for recording of time domain spectra of drug molecules. The refractive index, absorption coefficients and absorbance strength of this drug in THz domain were also ascertained. THz-Raman spectra simultaneously helps to characterize the crystalline nature of Cefixime's and its chemical composition and effect and concentration of its principal ingredients. The Raman spectra of these drugs molecules was recorded for cross verification of previous experimental findings. Finally, we have identified the absorbance strength of two important ingredients i.e. Sulpha Pyridine and Sulpha Thiazoles and specific absorbance of these ingredients was ascertained in THz domain to quantify the concentration per milligram level between 0.5 and 0.8 THz range. The obtained results reveal that concentration of these two ingredients varies from sample to sample. It help to determine the efficacy and side effects of the drugs produced from different manufacturers.

Keywords: Raman, THz Spectroscopy, Sulpha, Drug, Absorption, R.I., Concentration.

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