ABSTRACT:

The thesis titled "Development of a Novel Glucose Biosensor Based on WO_3 Doped Graphitic Carbon Nitride" explores the innovative design and development of a glucose biosensor employing a composite material of tungsten trioxide (WO_3) and doped graphitic carbon nitride ($g\text{-}C_3N_4$). This biosensor intends to provide increased sensitivity and selectivity for glucose detection, addressing the growing demand for efficient and reliable glucose monitoring devices. Several analytical methods, such as UV spectroscopy, Fourier-transform infrared spectroscopy, and photoluminescence spectroscopy, are used to characterize the biosensor. The biosensor's optical features and absorption traits are examined using UV spectroscopy, which sheds light on its photoactive behavior. Understanding the chemical makeup and functional groups inherent in the biosensor by FTIR spectroscopy will help to better comprehend its structural and chemical characteristics. To evaluate the photogenerated charge carrier dynamics and determine how well the sensor performs in catching and exploiting light-induced electron-hole pairs, photoluminescence spectroscopy is used. This research represents a important step towards the development of an advanced glucose biosensor, offering potential advancements in glucose monitoring technology with the promise of improved accuracy and efficiency for variety of biomedical applications.