Since the 21st century, with the continuous improvement in human living standards, the problems of global climate change, rapid population growth, and environmental pollution have become increasingly serious.The main water quality parameters include chemical oxygen demand (COD), heavy metal content, nitrate nitrogen (NO3-N), dissolved organic carbon (DOC), and turbidity.In addition, the research progress on the determination of COD, heavy metal ions, nitrate nitrogen, and DOC by UV-Vis spectroscopy was described in detail.In recent years, due to the advantages of high precision, high detection efficiency, nondestructive sampling, environmental protection, low cost, and portability, ultraviolet-visible (UV-Vis) technology combined with a variety of advanced technologies has developed into an excellent and effective tool for detecting pollutants in aqueous environments [7].In recent years, due to the advantages of high precision, high detection efficiency, nondestructive sampling, environmental protection, low cost, and portability, ultraviolet-visible (UV-Vis) technology combined with a variety of advanced technologies has developed into an excellent and effective tool for detecting pollutants in aqueous environments [7].This paper introduced the theoretical basis of determining various water quality parameters by UV-Vis spectroscopy and expounds the complete spectral data analysis process, including data preprocessing (Section 3.1), extraction of the characteristic wavelength (Section 3.2), establishment of absorbance and relevant water quality parameter model (Section 3.3), as shown in Figure 2.This paper introduced the theoretical basis of determining various water quality parameters by UV-Vis spectroscopy and expounds the complete spectral data analysis process, including data preprocessing (Section 3.1), extraction of the characteristic wavelength (Section 3.2), establishment of absorbance and relevant water quality parameter model (Section 3.3), as shown in Figure 2.UV-Vis spectrum analysis is an important development direction for water quality monitoring, which evaluates the degree of water pollution by establishing a correlation model of absorbance, organic matter, and inorganic matter concentration (Section 3.3) [8].UV-Vis spectrum analysis is an important development direction for water quality monitoring, which evaluates the degree of water pollution by establishing a correlation model of absorbance, organic matter, and inorganic matter concentration (Section 3.3) [8].Spectroscopy is a method to identify substances and conduct quantitative determination through the emission or absorption spectra of substances, which have been frequently used in the field of rapid water quality determination in recent years [6].Spectroscopy is a method to identify substances and conduct quantitative determination through the emission or absorption spectra of substances, which have been frequently used in the field of rapid water quality determination in recent years [6].Although some researchers have tried to summarize the field before [9], with the deepening of UV-Vis spectroscopy in this field of water quality detection, its research objects and research methods have also undergone tremendous changes.Although some researchers have tried to summarize the field before [9], with the deepening of UV-Vis spectroscopy in this field of water quality detection, its research objects and research methods have also undergone tremendous changes.With rapid social development and the increasing use of agricultural fertilizers, an increasing number of industrial pollutants are discharged into rivers and oceans, causing eutrophication.For example, Giudicianni et al. [10] used .principal component analysis (PCA) and wavelet transform to calculate water quality index.Sci.Sci

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