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Title:Terahertz spectroscopy for quantifying refined oil mixtures
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Abstract:In this paper, the absorption coefficient spectra of samples prepared as mixtures of gasoline and diesel in different proportions are obtained by terahertz time-domain spectroscopy. To quantify the components of refined oil mixtures, a method is proposed to evaluate the best frequency band for regression analysis. With the data in this frequency band, dualistic linear regression fitting is used to determine the volume fraction of gasoline and diesel in the mixture based on the Beer-Lambert law. The minimum of regression fitting R-Square is 0.99967, and the mean error of fitted volume fraction of 97# gasoline is 4.3%. Results show that refined oil mixtures can be quantitatively analyzed through absorption coefficient spectra in terahertz frequency, which it has bright application prospects in the storage and transportation field for refined oil.
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