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Title:Quantitative research of orange and carbendazim mixtures by terahertz time-domain spectroscopy

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Abstract:Mixture samples of orange and carbendazim were measured to obtain THz time domain signals using terahertz time-domain spectroscopy (THz-TDS). Processing with the Fast Fourier transform (FFT), refractive radix and absorption coefficient of samples were calculated by Fresnel equation. Multiple linear regression scheme was used to quantitatively analyze the content of carbendazim in orange based on absorption coefficient. The results show that the content relative errors of carbendazim and orange are all less than 7%. THz-TDS can be applied in the quantitative analysis of pesticide in fruits, which gives reference for application of this technology to pesticide detection in agricultural product.

Number of references:15
Main heading:Spectrophotometers
Controlled terms:Agricultural products - Fast Fourier transforms - Fungicides - Laser pulses - Linear regression - Pesticides - Plasmons - Terahertz spectroscopy
Uncontrolled terms:Absorption coefficients - Fresnel equation - Multiple linear regressions - Orange - Pesticide detection - Quantitative research - Relative errors - Terahertz time domain spectroscopy - THz-TDS - Time-domain signal
Classification code:931.3 Atomic and Molecular Physics - 931.1 Mechanics - 922.2 Mathematical Statistics - 921.3 Mathematical Transformations - 821.4 Agricultural Products - 821.2 Agricultural Chemicals - 803 Chemical Agents and Basic Industrial Chemicals - 801 Chemistry - 744.1 Lasers, General
Database:Compendex