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Title:Evaluation of walnut by terahertz nondestructive technology
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Abstract:The deterioration and shell thickness of walnut were studied using the terahertz time domain spectroscopy. Firstly, the THz spectra of moth-eaten, moldy and normal walnuts were compared, and the bad walnuts were properly rejected due to the differences of absorption peaks. Secondly, the transmission-type and reflection-type terahertz time domain spectroscopy system was used simultaneously, and a new formula to calculate shell thickness of walnut was built in the THz system. Then the authors measured the shell thickness based on the detectable refractive index of walnut, and the relative error was 3.7%. Consequently, the quality of walnut was evaluated nondestructively according to physical and chemical indicators from walnut THz spectra respectively.
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Main heading:Quality control
Controlled terms:Deterioration - Refractive index - Shells (structures)
Uncontrolled terms:Absorption peaks - Non destructive - Relative errors - Shell thickness - Tera Hertz - Terahertz time domain spectroscopy - Walnut
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