

100 Hz~3.98 MHz下苹果虎皮病果实电特性研究 Dielectric Properties of Fuji Apple Superficial Scald in the 100 Hz~3.98 MHz Range

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摘要: 为了研究富士苹果虎皮病果实电特性的变化规律,探讨利用电特性参数的变化来反映苹果内部的物理化学变化,运用LCR型电子测量仪测定了100 Hz~3.98 MHz频率、(20±1)℃恒温条件下贮藏1、8、15、22和29d的虎皮病果实复阻抗、电抗、电导、电容和介质损耗系数等电学参数。结果显示:在同一贮藏时间下,随着频率的增加,果实的复阻抗、电抗值在减小,电导值则在增加;而电容和果实的介质损耗系数变化则没有规律性。统计分析显示,感病果实和正常果实电容值在极显著差异(P<0.01)。结果表明:电容值基本可以正确反映苹果的实际品质情况。The change law of dielectric properties on Fuji apple superficial scald which stored at constant temperature was investigated. The mechanisms that reflected internal quality of fruit using dielectric properties were discussed so as to provide a new theoretical basis for nondestructive inspection and research methods to distinguish between diseased and normal fruits based on electrical properties. The fruits' dielectric properties, which embraced the impedance, reactance, conductance, capacitance and loss coefficient, were determined with going up frequency from 100 Hz to 3.98 MHz at (20±1)℃ by applying LCR electronic measure instrument. The results showed that with the frequency increasing, fruit impedance and reactance were decreased; the capacitance and dielectric loss coefficient were changed irregularly, while the conductance was increased in spiral form under same storage times. There was a significantly positive correlation between impedance and reactance, the value of capacitance were significantly different (P<0.01) between the diseased and normal fruits from 100 Hz to 3.98 MHz. The research revealed that the capacitance could reflect the quality of apples in some extent.

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