基于反射光谱特性的土壤有机质含量测定仪改进设计

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关键词：　　土壤 有机质含量 测量精度 弓曲差 反射光谱特性

摘　要：　　阐述了利用有机质的反射光谱特性对土壤有机质含量测定的原理及方法，并设计了测定仪器的总体设计方案、光路系统及仪器的硬件。为了进一步减小测量误差、提高仪器总体性能，在以前研究的基础上对光路系统的设计进行了改进——增加了另外3路光信号以反映土壤光谱在600 nm处的弓曲差，研究了不同土样处理方法对土壤有机质含量测量精度的影响。结果表明：在仪器中引入弓曲差信息后，仪器的测量精度得到了进一步提高，测量误差从7.69%减小到3.76%。 The principles and methods were introduced for measuring soil organic matter content with the aid of spectrum data diffusely reflected by the soil. The arrangement scheme, light system, hardware and software were carefully designed. In order to further decrease the measurement errors, on the basis of previous research, three other signals from different wavelengths of light were used——including the variation of "deviation of arch" for soil spectra at 600 nm. Different processing procedures of soil samples were used for analyzing the influence on precision of organic matter content. The results showed that the measuring precision between the measurements obtained by this system and by standard methods were remarkably improved and measuring errors were reduced from 7.69% to 3.76% obviously by including the variation of "deviation of arch" within the permissible range for practical use.

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