



## • Soil & Sediment Analysis Using Infrared Spectroscopy

Infrared spectroscopy offers a fast and accurate analysis of the following soil and sediment parameters:

- Water content
- Organic matter
- Organic salts
- Nitrogen content
- pH
- Phosphorous content
- Humic acids

There is an increased interest in the analysis of soils and sediments because of the need for maintaining and increasing agricultural production while at the same time avoiding over fertilization of soils which can result in contamination of surface waters, lakes and rivers. Analysis of soil parameters is therefore important for verifying soil and sediment quality and for monitoring variations in carbon exchange between soils and the atmosphere in an effort to reduce greenhouse gas emissions. Soil analysis by conventional methods is slow and expensive and requires much sample preparation.



Infrared spectroscopy offers a fast and accurate soil and sediment analysis on multiple parameters



MPA Multi Purpose FT-NIR analyzer is a benchtop instrument that can analyze soil samples.



MATRIX-I dedicated FT-NIR analyzer offers diffuse reflection sampling.

### FT-NIR Analysis of Soils and Sediment

Fourier Transform Near Infrared (FT-NIR) spectroscopy analyzes soil samples rapidly and non-destructively with little or no sample preparation and can provide the same accuracy and reproducibility as conventional chemical methods. Multiple constituents and parameters of all soil sub-samples from a field can be measured simultaneously thereby reducing the cost and improving the effectiveness of soil analysis. By using FT-NIR, analysis turn around time can be greatly reduced by hours and even days for a large number of samples.

### Advantages of FT-NIR Spectroscopy

- Measurements in seconds
- Non-destructive
- Cost effective
- Accurate and reproducible
- No sample preparation
- No consumables
- Multiple parameters per measurement

### Other FT-NIR Applications

- Feed and forage
- Milk
- Dairy products
- Grains
- Flour
- Oil seeds and edible oil

### Case Study



IR spectroscopy can enable an evidence-based diagnostic surveillance approach to agricultural and environmental management in developing countries

Today, World Agroforestry Centre (ICRAF) successfully uses a Bruker near-infrared spectrometer in Mali in a rudimentary laboratory based at the Institut d'Economie Rural (IER), Sotuba.

IER technicians are able to analyze not only soils and crops, but also a wide range of agricultural inputs and products, including manures, fertilizers, animal feeds, grains, milk, and agroforestry products such as wood, charcoal, and shea butter.

Analysis of livestock wastes will also provide farmers with important information on animal nutrition and health. IER technicians are scanning hundreds of archived soil and plant samples a day for which analytical data is available. These will be used to make calibrations so that soil and plant quality can be predicted directly in future from a 30-second scan on the spectrometer.

Bruker Optics is ISO 9001 certified

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