Soil and mineral samples
Measurement of Soil and mineral samples with photoacoustic spectroscopy

- Photoacoustic spectroscopy (PAS) is an advantageous method for the measurement of soil and mineral samples since it is contactless measurement and insensitive to the sample morphology.

- In PAS no sample preparation is needed such as for example mixing with KBr in diffuse reflectance.

- Mineral samples typically have a very hard surface, and therefore, a proper optical contact is hard to obtain with ATR method even with a diamond ATR.
Parameters:

Sample: Fluor apatite with natural enclosures (< 10%)

Measurement time: 25 seconds (10 scan)

FTIR device: Thermo Antaris

Resolution: 8 cm⁻¹

HeNe laser frequency: 2.5 kHz

Atmosphere: Helium

Pressure: 1 atm
Flogopite with natural enclosures (< 5%)

Parameters:

- **Sample**: Flogopite with natural enclosures (< 5%)
- **Measurement time**: 25 seconds (10 scans)
- **FTIR device**: Thermo Antaris
- **Resolution**: 8 cm\(^{-1}\)
- **HeNe laser frequency**: 2.5 kHz
- **Atmosphere**: Helium
- **Pressure**: 1 atm
Ca,Mg carbonate (with natural enclosures (< 12%))

Parameters:
Sample: Ca,Mg carbonate (with natural enclosures (< 12%))
Measurement time: 25 seconds (10 scans)
FTIR device: Thermo Antaris
Resolution: 8 cm$^{-1}$
HeNe laser frequency: 2.5 kHz
Atmosphere: Helium
Pressure: 1 atm
Parameters:

Sample: Coal
Measurement time: **25 seconds (10 scans)**
FTIR device: Thermo Antaris
Resolution: 8 cm\(^{-1}\)
HeNe laser frequency: 2.5 kHz
Atmosphere: Helium
Pressure: 1 atm
Parameters:

- **Sample:** Middleton organic soil sample
- **Measurement time:** 25 seconds (10 scans)
- **FTIR device:** Thermo Antaris
- **Resolution:** 8 cm$^{-1}$
- **HeNe laser frequency:** 2.5 kHz
- **Atmosphere:** Helium
- **Pressure:** 1 atm
Marathon county soil sample

Parameters:

Sample: Marathon county soil sample
Measurement time: 25 seconds (10 scans)
FTIR device: Thermo Antaris
Resolution: 8 cm\(^{-1}\)
HeNe laser frequency: 2.5 kHz
Atmosphere: Helium
Pressure: 1 atm
Bluestem clay soil sample

Parameters:
Sample: Bluestem clay soil sample
Measurement time: **25 seconds (10 scans)**
FTIR device: Thermo Antaris
Resolution: 8 cm⁻¹
HeNe laser frequency: 2.5 kHz
Atmosphere: Helium
Pressure: 1 atm
Parameters:

Sample: Silverlake soil sample
Measurement time: **25 seconds (10 scans)**
FTIR device: Thermo Antaris
Resolution: 8 cm$^{-1}$
HeNe laser frequency: 2.5 kHz
Atmosphere: Helium
Pressure: 1 atm