Method Summary

Determination of Ammonium Nitrate Extractable (MAFF) Alkali Metals in Soils

Scope and Range

This method is applicable to the preparation, extraction and analysis of alkali metals in agricultural soils following BS 3882:2015.
The method is accredited for Potassium and Magnesium in soil to ISO17025 and has no accreditation for Calcium and Sodium.
The limits of detection are as set out in Table 1. These are based on 5:1 Ammonium nitrate: soil extraction.
The calibrated ranges are also set out in Table 1. The density of the soil may be measured, and the results reported as mg/l soil.

Metal	Highest Calibration Standard (mg/l) [%w/w]	Limit of Detection % w/w
Potassium	100 [0.1]	0.001
Magnesium	100 [0.1]	0.002
Calcium	500 [0.5]	0.002
Sodium	500 [0.5]	0.002

Table 1 - Highest Calibration Points and Limits of Detection

References

BS 3882:2015

Principle

Preparation and Extraction:
Samples should be taken in a 1 litre plastic tub and kept at 1-5°C until ready for preparation.

The air dried sample is passed through a 2mm sieve (excluding stones and fibres).

The density of the soil is measured and the sample extracted through shaking with Ammonium Nitrate solution at a 5:1 ratio by volume

Analysis:
Specific wavelengths are used to measure the characteristic emissions of the four alkali metals in table 1.

Standards of known concentration are passed through the ICP-OES and the emissions at the specific wavelengths are used to calibrate the instrument.

The emissions from the samples are then measured and converted into concentrations using the instrument calibration.

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Interferences

Every effort is made to ensure that the most appropriate wavelengths are used for each metal, however some individual samples may contain other metals with emission wavelengths close to a measured wavelength. This may cause an interference.