



## Method Summary

### Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES

#### Scope and Range

This method is applicable for the analysis of routine metals in sandy soils, clay and loam by mixed acid digest and analysis by iCap 6500 Duo ICP-OES

Element	Calibration Range mg/kg	Reporting Limit mg/Kg	Accreditation status
Al	0 - 25000	11	None
As	0 - 500	0.6	MCerts
B	0 - 500	0.7	UKAS
Ba	0 - 500	0.6	UKAS
Be	0 - 500	0.01	MCerts
Cd	0 - 500	0.02	MCerts
Co	0 - 500	0.1	MCerts
Cr	0 - 500	0.9	MCerts
Cu	0 - 500	1.4	MCerts
Fe	0 - 25000	2	UKAS
Hg	0 - 500	0.14	MCerts
Mn	0 - 500	0.13	MCerts
Mo	0 - 500	0.1	UKAS
Ni	0 - 500	0.2	MCerts
P	0 - 500	1.0	None
Pb	0 - 500	0.7	MCerts
Sb	0 - 500	0.6	UKAS
Se	0 - 500	1.0	UKAS
Sn	0 - 500	0.24	UKAS
Sr	0 - 500	0.4	UKAS
Ti	0 - 500	0.1	None
Tl	0 - 500	0.7	UKAS
V	0 - 500	0.2	UKAS
Zn	0 - 500	1.9	MCerts

#### Principle

##### Preparation and Extraction

Soil samples submitted to the laboratory are prepared for analysis by drying and crushing. A sub-sample of the soil is taken and dried and crushed in accordance with in-house method PM-024 *Homogenisation and Preparation of Soil Samples*.

A 1g portion of the dried crushed sample is weighed into a plastic digitube and the weight recorded in Labware.

The sample is digested in a mixture of 2.5ml nitric acid and 7.5ml hydrochloric acid for 90 minutes at 110°C, before being diluted to 50 ml with de-ionised water.

The solution is centrifuged at 1500rpm for 15 minutes and a portion of the supernatant transferred to a vial for analysis by ICP-OES.

The ICP-OES instrument measures the intensity of characteristic emission lines for each element of interest in each sample.



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#### **Interferences**

Since many spectral lines are close to each other, there is the possibility of overlap occurring. Care must be taken to ensure that selected lines are free from interference, where this it is not possible, some form of correction should be used to prevent erroneous readings.

Since emission spectroscopy responses are linear over a wide concentration range, a simple mathematical calculation known as inter-element correction (IEC) can often be used.