

## Determination of multi-elemental in Soils according to EN 16174:2012

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EN 16174:2012 provides a multi-element *aqua regia* digestion of sludge, treated biowaste, and soil prior to analysis. It is known that the digestion of environmental samples with *aqua regia* will not necessarily lead to a complete element breakdown and that the extract from a test sample may not reflect the total concentrations of the target analytes. However, to complete elements breakdown, different acid mixtures were also compared with *aqua regia* approach. One-step microwave-assisted digestion procedures were investigated with the scope to obtain a fast method for multi-elemental analysis of soil samples by inductively coupled plasma-mass spectrometry (ICP-MS). As a model, certified reference material stream sediment (NCS DC 73325), produced by China National Analysis Center for Iron and Steel was used. The reagents whose extraction abilities have been examined were a mixture of HCl/HNO<sub>3</sub> (3:1 v/v i.e., *aqua regia*) according to EN 16174 procedure, and a mixture of HNO<sub>3</sub>/HCl/HF (8:1:1 v/v/v) for full digestion. The list of the selected elements is Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Se, Sn, Sr, Ti, Tl, U, V, W, Zn, and Zr. Most of them could be analyzed using *aqua regia* for the digestion of soil samples. Li, Be, Ca, Ti, V, Cr, Co, Ni, Cu, Zn, Se, Zr, Mo, Cd, Sn, W, Hg, Tl, Pb, and U can be easily and satisfactorily made available for environmental screening when digestion was performed using *aqua regia*, although the recoveries for these elements were better when the mixture HNO<sub>3</sub>/HCl/HF (v/v/v 8:1:1) was applied.