

Soil quality - Determination of total cyanide and easily liberatable cyanide - Continuous-flow analysis method (ISO 17380:2013)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 17380:2013 sisaldab Euroopa standardi EN ISO 17380:2013 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 17380:2013 consists of the English text of the European standard EN ISO 17380:2013.
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English Version

Soil quality - Determination of total cyanide and easily liberatable cyanide - Continuous-flow analysis method (ISO 17380:2013)

Qualité du sol - Détermination des cyanures totaux et des cyanures aisément libérables - Méthode d'analyse en flux continu (ISO 17380:2013)

Bodenbeschaffenheit - Bestimmung des Gehalts an gesamtem Cyanid und leicht freisetzbarem Cyanid - Verfahren mittels kontinuierlicher Durchflußanalyse (ISO 17380:2013)

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Foreword

This document (EN ISO 17380:2013) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 345 "Characterization of soils" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

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Endorsement notice

The text of ISO 17380:2013 has been approved by CEN as EN ISO 17380:2013 without any modification.

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Introduction

Cyanides may be present in soil as cyanide ions and as complex cyanides. They can be determined as easily-liberatable cyanide or as total cyanide. Complex cyanide can be calculated by subtracting the easily-liberatable cyanide result from the total cyanide result. This International Standard specifies the determination of easily-liberatable cyanide, complex cyanides and total cyanide.

Methods using flow analysis automate wet chemical procedures and are particularly suitable for the processing of many analytes in water or soil extracts in large sample series at a high analysis frequency. The continuous flow analysis (CFA) method uses an automated dosage of the sample into a flow system (manifold) where the analytes in the sample react with the reagent solution on their way through the manifold. The sample preparation may be integrated in the manifold. The reaction product is measured in a photometric detector (e.g. flow cell photometer).^{[1],[2]}

In ISO 11262 a manual method for the photometric and volumetric determination of total cyanide in soil samples is described. It should be noted that the total cyanide results in soil samples as described in ISO 11262 may show slight differences from this International Standard. These differences are not considered to be very significant for this analysis. The easily-liberatable cyanide test has been removed from ISO 11262 because the validation data for this method were very poor.

For the analysis of cyanide in water ISO 14403-1^[6] and ISO 14403-2^[7] can be applied. The analytical procedure described in ISO 14403-2^[7] is identical to the one specified in this International Standard.

Soil quality — Determination of total cyanide and easily liberatable cyanide — Continuous-flow analysis method

WARNING — Cyanide solutions are highly toxic. Appropriate measures shall be taken to avoid ingestion. Care should be taken in the disposal of these solutions.

1 Scope

This International Standard specifies a method for the photometric determination of the total cyanide and easily-liberatable cyanide content in soil using automated distillation/continuous-flow analysis.

The International Standard applies to all types of soil with cyanide contents above 1 mg/kg on the basis of dry matter, expressed as cyanide ion.

NOTE Sulfide concentrations in the sample higher than 40 mg/kg dry matter cause interference. This effect can be recognized by the split peaks and as a slow decrease of the detector signal and can only be prevented by diluting the sample extract.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 9297, *Water quality — Determination of chloride — Silver nitrate titration with chromate indicator (Mohr's method)*

ISO 11262, *Soil quality — Determination of total cyanide*

ISO 11465, *Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method*

ISO 14507:2003, *Soil quality — Pretreatment of samples for determination of organic contaminants*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

total cyanide content

content of inorganic cyanide compounds consisting of the sum of the contents of easily-liberatable cyanide species and cyanide bound to metal cyanides, with the exception of thiocyanate ions and only partial breakdown of the cyanide bound in cobalt, gold, palladium and platinum cyanide complexes

3.2

easily-liberatable cyanide

content of inorganic cyanide compounds consisting of the sum of the contents of the easily-liberatable cyanide ions and the cyanide bound in simple metal cyanides (all expressed as CN) which are determined under the conditions of the method described in this International Standard

Note 1 to entry: The weakly complexed cyanide contained in tetracyanonickelate(II) and dicyanomercurate(II) is determined with the method for easily-liberatable cyanide. Up to 5 % of the strongly complexed cyanide in iron(III) hexacyanoferrate(II), hexacyanoferrate(III) and hexacyanoferrate(II) is determined with the method for easily-liberatable cyanide. Organic cyanide compounds (such as acetonitrile) are not determined.