

Second edition
2019-02

Soil quality — Determination of dehydrogenases activity in soils —

Part 1: Method using triphenyltetrazolium chloride (TTC)

*Qualité du sol — Détermination de l'activité des déshydrogénases
dans les sols —*

Partie 1: Méthode au chlorure de triphényltétrazolium (CTT)



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological characterization*.

This second edition cancels and replaces the first edition (ISO 23753-1:2005), which has been technically revised. The main changes compared to the previous edition are as follows:

- a new [Clause 5](#) "Limitations" has been added;
- in [Clause 6](#), reagents and their preparation have been updated to new results [e.g. use of less toxic solvent (ethanol), substrate concentration of 60 mmol/l of TTC, concentration of Tris buffer of 100 mmol/l at pH 7,6, incubation time of 6 h];
- [Tables 1](#) and [2](#) have been added;
- [Clause 10](#) "Validity criteria" has been added;
- a new [Annex A](#) "Results of modified parameters" has been added;
- [Clause 2](#) "Normative references" and the Bibliography have been updated.

A list of all the parts in the ISO 23753 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The soil microflora is responsible for the decomposition and conversion of organic substances, carbon, nitrogen, sulfur and phosphorus cycles, soil aggregates stability and as a food source for microbivores. Dehydrogenases, as intracellular enzymes and respiratory chain components of the microbial cells, play a major role in the production of energy by organisms. They oxidize organic compounds by transferring electrons to an acceptor (e.g. NAD^+). Dehydrogenases are essential components of the enzyme system of microorganisms. Dehydrogenases activity can therefore be used as an indicator of biological redox systems and as a measure of the viable and physiologically active soil microbial community.

Microbial oxidative activity in soil is linked to respiratory activity, which could be approached with the determination of dehydrogenases activity. Basal and induced respiration in soil could be affected by soil management, practices and contamination.