

ICS 13.300; 13.020
CCS A 80



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 27854-2011

**Chemicals -- Soil microorganisms -- Nitrogen transformation
test**

化学品 土壤微生物 氮转化试验

(English Translation)

Issued on: December 30, 2011

Implemented on: August 1, 2012

Issued by: Standardization Administration of China

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

The Standards and Organisation for Economic Co-operation and Development OECD Guidelines for the Testing of Chemicals 216 "Microbial nitrogen transformation test" (in English) TECHNOLOGY the same technique content.

This standard configuration and do the following editorial changes.

- The original preamble adjustment of introduction;
- Adjust the terms and definitions from the appendix to the original text content;
- The units of measurement to our legal units of measurement.

This standard is managed by the National Standardization Technical Committee chemicals dangerous (SAC/TC251) and focal points.

This standard was drafted. Guangdong microbiological analysis of the test center, Hubei Exit Inspection and Quarantine, the Ministry of Environmental Protection chemicals registration Heart, Chinese Academy of Inspection and Quarantine, Guangdong Germany and the US Fine Chemical Co., Ltd. of Dongguan St. source of environmental technology.

Introduction

This test method is used to assess the long-term effects after a single exposure to chemicals on soil microbial nitrogen transformation activity. This test is based primarily on Europe Chau and Mediterranean Plant Protection Organization recommended test method [1], and reference from the German Federal Biological Research institutions [2], the United States Environmental Protection Bureau [3], Society of Environmental Toxicology and Chemistry [4] and the International Organization for Standardization [5] Test Method. In 1995, OECD soil/sediment work Agreed [6] groups use this test in Italy Belgirate on soil

type and number. Collection on soil samples at Processing and storage of the main reference ISO guidance document [7] and the recommendations of the Working Group of the Belgirate.

When the toxicity of the test was to evaluate, for example, the need to provide crop protection products for soil microbial flora of the potential negative when affected, or when soil microbes may be exposed to other chemicals other than crop protection products, the need to determine the test substance on soil Soil microbial activity. Nitrogen transformation test is used to test for these chemicals affect soil microbial flora. If the test substance of agricultural chemicals (such as crop protection products, fertilizers, forestry chemicals), you need to test nitrogen transformation and carbon transformation test. If the test it was non-agricultural chemicals, just with nitrogen transformation test. However, if the measured chemical nitrogen transformation test EC50 values \u200b\u200bfall Commercial Glass Inhibitors (such as 2-chloro-6-trichloromethyl pyridine) within the range of EC50 values, by performing a carbon need for further transformation test information.

Soil is composed of complex, non-homogeneous mixture of biotic and abiotic. Microbes play in fertile soil organic matter degradation and transformation processes Play an important role, and the different types of microbes for all aspects of soil fertility in both contributions. And any of these biochemical processes Long-term intervention would interfere with nutrient cycling, soil fertility and thus change. All the fertile soil there is conversion of carbon and nitrogen, although different soil Soil microbial communities involved in these transformation processes vary, but the conversion pathways are essentially the same.

This test is used to examine the subject matter in the topsoil aerobic long-term negative effect on the nitrogen conversion process. This test method can also be used to evaluate Microbial flora was tested for carbon conversion process impact. Nitrate usually occurs in the formation of carbon - nitrogen bond after fracture. Thus, when and nitrate formation rate in the control group treated the same, it can be inferred that the major carbon degradation pathways are intact and effective. Test selected Medium (such as alfalfa powder) should have the right ratio of carbon and nitrogen, usually in the range of 12/1 to 16/1. Thus during the test microorganism "Carbon starvation" phenomenon was the cell will decrease, and even if the microbial community has been destroyed chemicals may also be restored in the 100d.

This test is mainly for those who can be expected that the actual amount of the substance that is satisfied in the soil, for example, crop protection products in the field of administration Rate is known. Agrochemicals, according to its expected rate in two doses to be administered at the time of the test. Agrochemicals can its Active ingredient (ai) or as a form of product testing. However, this test is not just for agrochemicals. By simultaneously varying Soil test mode when the test substance and the amount of data evaluation, this method is also applicable to those affected by the amount of sodium in the soil can not be

determined yet Chemicals. Thus, non-agricultural chemicals, necessary to measure the impact of a series of different concentrations of nitrogen transformation. According to the experimental data obtained by drawing Dose - response curve and calculate ECx values, where x is defined as the percent inhibition of nitrogen transformation.

Chemical soil microbial nitrogen transformation test

1 Scope

Chemical soil microbial nitrogen transformation test methods This standard specifies the overview, equipment, test systems, test procedures, quality assurance and quality control, data and reports.

This standard applies to assess the long-term negative impact after a single exposure to chemicals on soil microbial nitrogen transformation activity.

2 Terms and definitions

The following terms and definitions apply to this document.

Nitrogen Transformation by microbial ammonification and nitrification, nitrogen-containing organic matter eventually degrade to inorganic end-product nitrate process.

Effect concentration effectiveconcentration, ECx Conversion percentage inhibition caused by nitrogen concentration x when the soil test substance.

Half effect concentration medianeffectiveconcentration, EC50 Causing nitrogen conversion percentage inhibition concentration of the test substance in soil at 50%.

3 Methods Summary

Sift the soil and plant debris after treatment with the test substance or left untreated (control group). If the test substance is agrochemicals, then to Less choice of two concentrations tested, the concentration of the test substance can refer to set the expected maximum concentration in the field of administration. Culture 0d, 7d, 14d and 28d, remove a certain amount of soil samples from the treatment group and the control group, with a suitable solvent extraction and determination of nitrate-containing extract the amount. Nitrate formation rate between treated and control group, calculate the percentage difference between treatment groups with respect to the control group. All trials held at least Continued 28d, if the difference between the first 28 days of treatment and control groups is not less than 25%, the test can be extended up to 100d. If the test substance is non-farm Chemicals, will be a series of different concentrations of the test substance added to soil samples and treated and control groups in the determination of nitrate in the first 28 days Production amount. Using the regression model series of concentrations of the test results were analyzed and calculate ECx values (ie EC50, EC25 and/or EC10).

4 Equipment

4.1

test container should be chemically inert material, and should have the appropriate training methods and soil volume to match that of soil samples Overall bulk form or in the form of a series of dispensing independent cultures (see 6.1.2). During the test should be to minimize the loss of water and Maintaining gas exchange (for example. test container can be covered with polyethylene foil apertures). As the test substance is volatile, it should be closed or Test airtight container. The size of the test sample container filled with soil accounts for about 1/4 of its volume is appropriate.

4.2

requires the following standard laboratory equipment.

- Stirring device (mechanical shaker or the like);
- Centrifugation (3000g) or filtration device (using nitrate-free filter paper);