INTERNATIONAL STANDARD

ISO 21338

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Water quality — Kinetic determination of the inhibitory effects of sediment, other solids and coloured samples on the light emission of *Vibrio fischeri* (kinetic luminescent bacteria test)

Qualité de l'eau — Détermination cinétique des effets inhibiteurs des échantillons de sédiment, autres solides et des échantillons colorés sur la luminescence de Vibrio fischeri *(essai cinétique de bactéries luminescentes)*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 21338 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*.

Introduction

The method specified in this International Standard is a kinetic modification of the luminescent bacteria test specified in ISO 11348. The kinetic method overcomes the problems arising from intense colour and turbidity in the samples. There is no need for sedimentation or centrifugation of turbid samples, or for the correction of colour as described in ISO 11348.

This kinetic method uses luminometers capable of dispensing luminescent bacteria to the samples and measuring the luminescent intensity over a period of time. In the method, the bacterial suspension is dispensed and mixed with the sample in the measurement chamber of the luminometer. Several suitable instruments are commercially available, but only a few of them are capable of cooling the measurement chamber to (15 ± 1) °C as specified in ISO 11348. However, if the bacterial suspension and test samples are kept at (15 ± 1) °C in a thermo-block before the measurement and during the whole incubation, the actual temperature during the contact time is (15 ± 1) °C.

The measurements specified in this International Standard can be carried out using freshly prepared bacteria, as well as freeze- or liquid-dried bacterial preparations. The various bacterial preparations can deliver different results, especially in the presence of heavy metals (see ISO 11348). The laboratories responsible for the results have the opportunity to select the most suitable bacterial preparation based on expert judgement and information about the samples to be tested.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this International Standard be carried out by suitably trained staff.

1 Scope

This International Standard specifies the kinetic direct-contact method for determining the inhibitory effect of suspensions of sediment and other solid samples, and also for problematic turbid or coloured aqueous samples on the light emission of the marine bacterium *Vibrio fischeri* (NRRL B-11177).

This method is applicable to:

a) sediment samples and water suspensions of sediments (fresh water, brackish, and seawater sediments);

b) effluents (especially turbid and coloured);

c) aqueous extracts (e.g. leachates, eluates, elutriates) of soil, solid waste, and other solid material (especially turbid and coloured).

2 Normative references

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

ISO 5667-16:1998, *Water quality — Sampling — Part 16: Guidance on biotesting of samples*

ISO 5814, *Water quality — Determination of dissolved oxygen — Electrochemical probe method*

ISO 11348-1, *Water quality — Determination of the inhibitory effect of water samples on the light emission of* Vibrio fischeri *(Luminescent bacteria test) — Part 1: Method using freshly prepared bacteria*

ISO 11348-2, *Water quality — Determination of the inhibitory effect of water samples on the light emission of* Vibrio fischeri *(Luminescent bacteria test) — Part 2: Method using liquid-dried bacteria*

ISO 11348-3:2007, *Water quality — Determination of the inhibitory effect of water samples on the light emission of* Vibrio fischeri *(Luminescent bacteria test) — Part 3: Method using freeze-dried bacteria*