SLOVENSKI STANDARD
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Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev permanganat

Chemicals used for treatment of water intended for human consumption - Sodium permanganate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumpermanganat

Produits chimiques utilisés pour le traitement de l'eau destinée a la consommation humaine - Permanganate de sodium

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Chemicals used for treatment of water intended for human consumption - Sodium permanganate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Permanganate de sodium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumpermanganat

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 15482:2007) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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

This document will be largely based on EN 12672:2000 [3] Chemicals used for water treatment intended for human consumption – potassium permanganate.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

In respect of the potential adverse effects on the quality of water intended for human consumption caused by the product covered by this European Standard:

a) this European Standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;

b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the product in any of the Member States of the EU or EFTA. The use of the product covered by this European Standard is subject to regulation or control by National Authorities.

1 Scope

This European Standard is applicable to sodium permanganate used for the treatment of water intended for human consumption. It describes the characteristics of sodium permanganate and specifies the requirements and the corresponding test methods for sodium permanganate. It provides information on its use in water treatment.

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.

EN 1483, *Water quality - Determination of mercury - Method using atomic absorption spectrometry*

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*

EN ISO 11885, *Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)*

EN ISO 11969, *Water quality - Determination of arsenic – Atomic absorption spectrometric method (hydride technique. (ISO 11969:1996)*

ISO 3165, *Sampling of chemical products for industrial use - Safety in sampling*

ISO 3856-2, *Paints and varnishes - Determination of "soluble" metal content - Part 2: Determination of antimony content - Flame atomic absorption spectrometric method and Rhodamine B spectrophotometric method*

ISO 6206, *Chemical products for industrial use - Sampling – Vocabulary*

ISO 8288, *Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods*.

ISO 9174, *Water quality - Determination of total chromium - Atomic absorption spectrometric methods*

ISO 9965, *Water quality – Determination of selenium – Atomic absorption spectrometric method (hydride technique)*

3 Description

3.1 Identification

3.1.1 Chemical name.

Sodium permanganate.

3.1.2 Synonym or common name.

Permanganate acid sodium salt.

3.1.3 Relative molecular mass.

141,93

3.1.4 Empirical formula.

$NaMnO_4$

3.1.5 Chemical formula.

$NaMnO_4$

3.1.6 CAS Registry Number [1].

10101-50-5

3.1.7 EINECS reference [2].

233-251-1

3.2 Commercial forms

The sodium permanganate is usually available as a concentrated solution with a concentration within the range of mass fraction of 20 % to 40 %.

The density of sodium permanganate solutions is given in Table 1.

[1] Chemicals Abstracts Service Registry Number.

[2] European Inventory of Existing Commercial Chemical Substances.

Table 1

Solution concentration Mass fraction in %	**Density** g/ml at 22 °C
10	1,076
15	1,116
20	1,164
25	1,216
30	1,266
35	1,316
40	1,374

3.3 Physical properties

3.3.1 Appearance.

Sodium Permanganate Solution is a dark purple coloured solution.

3.3.2 Density.

The density of 40,00 % Sodium Permanganate Solution is 1,37 g/cm^3 at 20 °C.

3.3.3 Solubility (in water).

Sodium Permanganate Solution is soluble up to 40 % and miscible with water in all proportions.

3.3.4 Vapour pressure.

Not determined for Sodium Permanganate Solution, however, very similar to water.

3.3.5 Boiling point at 100 kPa[3].

Greater than 101 °C.

3.3.6 Melting point.

Not applicable.

3.3.7 Specific heat

Not determined.

3.3.8 Viscosity (dynamic).

Less than 0,005 Pa·s for concentrations of 40 % or less

3.3.9 Critical temperature.

Not determined.

3.3.10 Critical pressure.

Not determined.

3.3.11 Physical hardness.

Not applicable.

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[3] 100 kPa = 1 bar.

3.4 Chemical properties

Sodium permanganate is a very strong oxidizing agent.

It is soluble in water and dissolves in various organic solvents (methanol, ethanol).

NOTE The reaction with organics can be violent and is not recommended.

It decomposes at a high temperature and also in the presence of concentrated acids, hydrogen peroxide and organic compounds in general.

It hydrolyses very slowly in contact with air, reducing to manganese dioxide (MnO_2), a solid, brown to black colour product.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for sodium permanganate used for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the product. Depending on the raw material and the manufacturing process other impurities may be present and, if so, the user and when necessary to relevant authorities shall be notified.

NOTE Users of this product should check the national regulations to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product not stated in this product standard.

Limits have been given for impurities and chemical parameters where these are likely to be present in significant quantities from the current production process and raw materials. If the production process or raw materials leads to significant quantities of impurities, by-products or additives being present, the user shall be notified.

4.2 Composition of commercial product

The sodium permanganate is usually available in a concentrated solution with a concentration within the range of mass fraction of 20 % to 40 %.

The concentration of sodium permanganate solution shall be equal to or greater than the manufacturer specified value.

4.3 Impurities and main by-products

The content of manganese dioxide (insoluble matter) shall be no more than a mass fraction of 0,055 %.

NOTE The product can contain fluoride or hexafluorosilicate. At typical levels of dosing, the added fluoride would be less than 40 µg/l.