



SLOVENSKI STANDARD

SIST EN 902:2000

01-november-2000

Kemikalije, ki se uporabljajo za pripravo pitne vode - Vodikov peroksid

Chemicals used for treatment of water intended for human consumption - Hydrogen peroxide

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Wasserstoffperoxid

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Peroxyde d'hydrogene

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Ta slovenski standard je istoveten z: EN 902:1999

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ICS:

13.060.20	Pitna voda	Drinking water
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 902

October 1999

ICS 71.100.80

English version

Chemicals used for treatment of water intended for human consumption - Hydrogen peroxide

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Peroxyde d'hydrogène

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Wasserstoffperoxid

This European Standard was approved by CEN on 5 September 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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 April 2000, and conflicting national standards shall be withdrawn at the latest by April 2000.

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

Annex A is informative.

The Annexes B and C are normative.

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Introduction

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

- 1) this 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 ;
- 2) 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.

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1 Scope

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

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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

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

ISO 5666-1:1983, *Water quality - Determination of total mercury by flameless atomic absorption spectrometry - Part 1 : Method after digestion with permanganate-peroxodisulfate*.

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 chromium - Atomic absorption spectrometric methods*.

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3 Description

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3.1 Identification <https://standards.iteh.ai/catalog/standards/sist/3e0776d7-cd20-4c28-a4dc-eee2f59c4256/sist-en-902-2000>

3.1.1

chemical name

hydrogen peroxide

3.1.2

synonym or common name

none

3.1.3

relative molecular mass

34,02

3.1.4

empirical formula

H₂O₂

3.1.5

chemical formula

H₂O₂

3.1.6

CAS Registry Number¹⁾

7722-84-1

1) Chemical Abstracts Service Registry Number.

3.1.7
EINECS reference²⁾
231-765-0

3.2 Commercial form

The product is supplied as aqueous solution with an hydrogen peroxide content of 20 percent by mass (% (m/m)) to 70 % (m/m).

3.3 Physical properties

3.3.1 Appearance and odour

The product is a colourless liquid, with a slightly pungent odour.

3.3.2 Density

The density of hydrogen peroxide is given in Table 1.

Table 1 - Density

Solution concentration % (m/m)	Density g/ml at 20 °C
20	1,075
30	1,114
35	1,132
50	1,195
60	1,241
70	1,289

3.3.3 Solubility in water

The product is miscible with water in all proportions.

3.3.4 Vapour pressure

The vapour pressure of hydrogen peroxide depending on concentration is given in Table 2.

Table 2 - Vapour pressure

Solution concentration % (m/m)	Vapour pressure kPa at 20 °C
20	2,0
30	1,8
35	1,7
50	1,3
60	1,1
70	0,8

2) European Inventory of Existing Commercial Chemical Substances.

3.3.5 Boiling point at 100 kPa³⁾

The boiling point of hydrogen peroxide depending on concentration is given in Table 3.

Table 3 - Boiling point

Solution concentration % (m/m)	Boiling point °C at 100 kPa
20	103
30	106
35	108
50	114
60	119
70	125

3.3.6 Crystallization point

The crystallisation point of hydrogen peroxide depending on concentration is given in Table 4.

Table 4 - Crystallization point

Solution concentration % (m/m)	Crystallization point °C
20	- 14,6
30	- 25,7
35	- 32,5
50	- 51
60	- 55
70	- 37

3.3.7 Specific heat

The specific heat of hydrogen peroxide depending on concentration is given in Table 5.

Table 5 - Specific heat

Solution concentration % (m/m)	Specific heat kJ/(kg.K)
20	3,82 at 20 °C
50	3,32 at 20 °C
100	2,63 at 25 °C

3) 100 kPa = 1 bar.

3.3.8 Viscosity, dynamic

The viscosity of hydrogen peroxide depending on concentration is given in table 6.

Table 6 - Viscosity

Solution concentration % (m/m)	Viscosity MPa.s at 20 °C
20	1,04
30	1,07
35	1,10
50	1,17
60	1,20
70	1,24
100	1,25

3.3.9 Critical temperature

The critical temperature of pure hydrogen peroxide is 457 °C.

3.3.10 Critical pressure

The critical pressure of pure hydrogen peroxide is 21,7 mPa.

3.3.11 Physical hardness

Not applicable.

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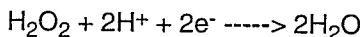
<https://standards.iteh.ai/catalog/standards/sist/3e0776d7-cd20-4c28-a4dc-eee2f59c4256/sist-en-902-2000>

3.4 Chemical properties

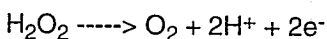
Hydrogen peroxide is a weak acid.

According to species in solution, it is an oxidizing agent ($E^\circ = 1,776 \text{ V}$) or a reducing agent ($E^\circ = 0,682 \text{ V}$).

Oxidizing agent :



Reducing agent :



It can be activated by ultraviolet light, ozone or metals to generate free radicals.

Singlet oxygen can be obtained by reaction of hydrogen peroxide with hypochlorite.

4 Purity criteria

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

4.1 Composition of commercial product

The hydrogen peroxide is available in solution with concentration within the range of 20 % (*m/m*) to 70 % (*m/m*).

The concentration of hydrogen peroxide shall be equal to or greater than the value specified by the manufacturer.

4.2 Impurities and main by-products

Not applicable.

4.3 Toxic substances

NOTE For the purpose of this standard, "toxic substances" are those defined in the EU Directive 80/778/EU of July 15, 1980 (see [1]).

The content of toxic substances shall conform to the requirements specified in Table 7.

Table 7 - Toxic substances

Parameter	Limit in mg/kg of hydrogen peroxide (100 % (<i>m/m</i>))	
	Type 1	Type 2
Arsenic (As) max.	0,5	1
Cadmium (Cd) max.	0,5	1
Chromium (Cr) max.	0,5	1
Mercury (Hg) max.	0,5	1
Nickel (Ni) max.	1	5
Lead (Pb) max.	0,5	1
Antimony (Sb) max.	0,5	1
Selenium (Se) max.	0,5	1

NOTE Cyanide which does not exist in a strong oxidizing medium such as hydrogen peroxide is not a relevant toxic substance. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process.

5 Test methods

5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206.

5.1.1 Sampling from drums and bottles

5.1.1.1 General

5.1.1.1.1 Mix the contents of the container to be sampled by shaking the container, by rolling it or by rocking it from side to side, taking care not to damage the container or spill any of the liquid.

5.1.1.1.2 If the design of the container is such (for example, a narrow-necked bottle) that it is impracticable to use a sampling implement, take a sample by pouring after the contents have been thoroughly mixed. Otherwise, proceed as described in 5.1.1.1.3.