SLOVENSKI STANDARD

kSIST FprEN 12931:2014

01-september-2014

Kemikalije, ki se uporabljajo za pripravo pitne vode - Kemikalije za uporabo v sili - Natrijev dikloroizociaourat, brez vode

Chemicals used for treatment of water intended for human consumption - Chemicals for emergency use - Sodium dichloroisocyanurate, anhydrous

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Produkte für den Notfall - Natriumdichlorisocyanurat, wasserfrei

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Produits chimiques utilisés en cas d'urgence - Dichloroisocyanurate de sodium, anhydre

Ta slovenski standard je istoveten z: FprEN 12931

ICS:

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
FprEN 12931

June 2014

ICS 71.100.80

Will supersede EN 12931:2008

English Version

Chemicals used for treatment of water intended for human consumption - Chemicals for emergency use - Sodium dichloroisocyanurate, anhydrous

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Produits chimiques utilisés en cas d'urgence - Dichloroisocyanurate de sodium, anhydre

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This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 164.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Foreword

This document (FprEN 12931:2014) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12931:2008.

Significant technical difference between this edition and EN 12931:2008 is as follows:

a) deletion of reference to EU Directive 67/548/EEC of June 27, 1967 in order to take into account the latest Regulation in force (see [2]);

b) clause 6.2 – updating of risk and safety labelling according to EU Regulation [2] and its latest Adaptations to Technical Progress):

Introduction

In respect of 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 dichloroisocyanurate anhydrous used for emergency treatment of water intended for human consumption. It describes the characteristics of sodium dichloroisocyanurate anhydrous and specifies the requirements and the corresponding test methods for sodium dichloroisocyanurate anhydrous. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use of sodium dichloroisocyanurate anhydrous (see Annex B).

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 1233, *Water quality - Determination of chromium - Atomic absorption spectrometric methods*

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)*

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

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

ISO 8213, *Chemical products for industrial use — Sampling techniques — Solid chemical products in the form of particles varying from powders to coarse lumps*

ISO 8288:1986, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*

3 Description

3.1 Identification

3.1.1 Chemical name

1-sodium - 3,5-dichloro - 1,3,5-triazine - 2,4,6-trione.

3.1.2 Synonym or common name

Sodium dichloroisocyanurate.

Troclosene sodium

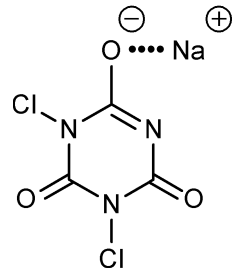
3.1.3 Relative molecular mass

219,98

3.1.4 Empirical formula

$C_3N_3O_3Cl_2Na$

3.1.5 Chemical formula



3.1.6 CAS Registry Number[1)]

2893-78-9

3.1.7 EINECS reference[2)]

220-767-7

3.2 Commercial form

The product is available in various granular forms.

3.3 Physical properties

3.3.1 Appearance and odour

The product is a white granular solid with chlorinous odour.

3.3.2 Density

The bulk density of the product is approximately 0,9 g/cm^3.

3.3.3 Solubility in water

The solubility of the product in water is 250 g/l at 25 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa[3)]

Not applicable, the product decomposes before fusion.

3.3.6 Melting point

Not applicable.

3.3.7 Specific heat

(1,09 ± 0,04) kJ/kg.K at 20 °C.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.8 Viscosity (dynamic)

Not applicable.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

The product is a strong oxidant, it is corrosive and hygroscopic; sodium dichloroisocyanurate decomposes into hydrochloric acid and cyanuric acid. When dissolved in an excess of water it liberates chlorine by hydrolysis.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for anhydrous sodium dichloroisocyanurate 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, this shall be notified to the user and when necessary to relevant authorities.

Users of this product should check the national regulations in order 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 lead to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

4.2 Composition of commercial product

The product shall contain at least a mass fraction of 62 % of available chlorine as calculated in accordance with the corresponding method given in 5.2.1.

4.3 Impurities and main by-products

The water content shall be less than a mass fraction of 3 % of the product.

The sodium chloride content shall be less than a mass fraction of 0,05 % of the product.

4.4 Chemical parameters

The product shall conform to the requirements specified in Table 1.

Table 1 — Chemical parameters

Element		Limit mg/kg of product	
		Type 1	Type 2
Arsenic (As)	max.	10	10
Cadmium (Cd)	max.	1	1
Chromium (Cr)	max.	6	10
Mercury (Hg)	max.	0,02	0,02
Nickel (Ni)	max.	3	5
Lead (Pb)	max.	4	15
Antimony (Sb)	max.	5	5
Selenium (Se)	max.	1	1
NOTE Cyanide, which does not exist in a strong oxidizing medium such as sodium dichloroisocyanurate, is not a relevant chemical parameter. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process. For parametric values of sodium dichloroisocyanurate on trace metal content in drinking water, see [1].			

5 Test methods

5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206. Prepare the laboratory sample(s) required by the relevant procedure described in ISO 8213.

5.2 Analysis

5.2.1 Determination of available chlorine (main product)

5.2.1.1 Principle

The available chlorine is determined by measuring active chlorine in the sample. The oxidizing chlorine reacts with potassium iodide releasing iodine which is then titrated with sodium thiosulfate standard volumetric solution in the presence of starch indicator solution.

5.2.1.2 Reagents

All reagents shall be of a recognized analytical grade and the water used shall conform to grade 3 in accordance with EN ISO 3696.

5.2.1.2.1 Potassium iodide crystals (KI).

5.2.1.2.2 Glacial acetic acid.

5.2.1.2.3 Sodium thiosulfate standard volumetric solution, $c(Na_2S_2O_3.5H_2O)$ = 0,1 mol/l.

Standard volumetric solutions of sodium thiosulfate are commercially available.

Alternatively a standard volumetric solution can be prepared by the following procedure: Dissolve 24,8 g $Na_2S_2O_3.5\ H_2O$ in a 1 000 ml one-mark volumetric flask in about 0,75 l water. After the temperature has equalized, make up to the mark with water and mix thoroughly.

To standardize: Weigh, to the nearest 0,1 mg, 3,600 g (m) of dry potassium iodate. Dissolve in water in a 1 000 ml one-mark volumetric flask, make up to the mark with water and mix (standard reference solution c(1/6 KIO_3) = 0,1 mol/l). Place 200 ml of water in a 500 ml stoppered conical flask, add (2 ± 0,5) g of potassium iodide and stir to dissolve. Then introduce, by means of a pipette, 10,0 ml of sodium thiosulfate solution for standardization, add (15 ± 1) ml of hydrochloric acid solution (diluted 1 + 1 by volume) and (5 ± 1) ml of starch solution (5.2.1.2.4).

Titrate immediately with the potassium iodate standard reference solution until the appearance of a blue coloration persisting for at least 30 s occurs. Record the volume (V_1) of iodate used.

The actual concentration, c, of the sodium thiosulfate standard volumetric solution ($Na_2S_2O_3.5H_2O$), expressed in moles per litre is given by the following formula:

$$c = \frac{V_1 \times c_1}{V} \qquad (1)$$

where

c_1 is the concentration, expressed in moles per litre, of the potassium iodate standard reference solution [c(1/6 KIO_3) = 0,1 mol/l];

V is the volume, in millilitres, of the sodium thiosulfate standard volumetric solution used for the standardization (V = 10 ml);

V_1 is the volume, in millilitres, of potassium iodate standard reference solution used in the titration.

5.2.1.2.4 Starch solution, mass fraction 1 %.

Make a slurry with (1 ± 0,1) g starch and (5 ± 1) ml water. Add (90 ± 5) ml boiling water to the slurry. Stir to dissolve it and cool the solution. This solution needs refrigeration to avoid the decomposition of the starch which results in a vague end point. Keep the solution cool and use it within one week.

NOTE Commercial indicators for iodine titration exist and can be used in place of the specified starch solution provided that their efficiency has been previously tested.

5.2.1.3 Apparatus

5.2.1.3.1 Ordinary laboratory apparatus and glassware

5.2.1.4 Procedure

5.2.1.4.1 Test portion

Weigh, to the nearest 0,1 mg, 0,25 g of the laboratory sample (m_0) into a tared stoppered weighing bottle.

5.2.1.4.2 Determination

Transfer the test portion to a 200 ml volumetric flask.

Add 10 ml of water and 10 ml of glacial acetic acid (5.2.1.2.2), stir for 5 min and then add 100 ml of water and 2 g of potassium iodide (5.2.1.2.1), and mix to dissolve and wait 10 min. Titrate with the sodium thiosulfate standard volumetric solution (5.2.1.2.3) to a light yellow colour. Add 5 ml of the starch solution (5.2.1.2.4) and continue titration to the disappearance of the blue black colour. Record the volume (V_1) of the sodium thiosulfate standard volumetric solution used.

5.2.1.5 Expression of results

The chlorine (Cl_2) content, C_1, expressed as a mass fraction in %, is given by the following formula:

$$C_1 = \frac{V_1 \times 0{,}003545 \times c}{m_0} \times 100 \qquad (2)$$

where

V_1 is the volume, in millilitres, of the sodium thiosulfate solution (5.2.1.2.3) used for the titration;

m_0 is the mass, in grams, of the test portion (5.2.1.4.1);

0,003545 is the mass, in grams, of chlorine (Cl_2) corresponding to 1,00 ml of sodium thiosulfate solution, $c(Na_2S_2O_3.5H_2O)$ = 0,1 mol/l;

c is the actual concentration, expressed in moles per litre of the sodium thiosulfate standard volumetric solution (5.2.1.2.3).

5.2.1.6 Accuracy

The result is accurate to within ± 0,1 %.

5.2.2 Impurities

5.2.2.1 Water

5.2.2.1.1 Principle

The water content in sodium dichloroisocyanurate is determined by the mass loss after heating in an oven. The temperature is set at a low level because sodium dichloroisocyanurate can lose chlorine on heating.

5.2.2.1.2 Apparatus

5.2.2.1.2.1 **Oven made of aluminium**, provided with a means of circulating the air inside.

5.2.2.1.3 Procedure

Weigh 10 g of the laboratory sample (m_1), to the nearest 0,001g, in a glass evaporating dish (diameter 150 mm).

Put it in the ventilated oven at 105 °C for 4 h.

Allow to cool in a desiccator and weigh again.

5.2.2.1.4 Expression of results

The water content (w), expressed as a mass fraction in % is given by the following formula:

$$w = \left(\frac{m_1 - m_2}{m_1} \right) \times 100 \qquad (3)$$

where

m_1 is the mass, in grams, before drying;

m_2 is the mass, in grams, after drying.