SLOVENSKI STANDARD
SIST EN 12931:2000

01-november-2000

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

Chemicals used for 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 - Natriumdichloroisocyanurat, wasserfrei

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

Ta slovenski standard je istoveten z: **EN 12931:2000**

ICS:

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

SIST EN 12931:2000 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12931

April 2000

ICS 71.100.80

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

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

This European Standard was approved by CEN on 22 March 2000.

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.

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

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

Ref. No. EN 12931:2000 E

Contents

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 October 2000, and conflicting national standards shall be withdrawn at the latest by October 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.

Introduction

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

a) 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 ;

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.

1 Scope

This European Standard is applicable to anhydrous sodium dichloroisocyanurate used for emergency treatment of water intended for human consumption. It describes the characteristics of anhydrous sodium dichloroisocyanurate and specifies the requirements and the corresponding test methods for anhydrous sodium dichloroisocyanurate. 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.*

EN 1483, *Water quality – Determination of mercury.*

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, *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.*

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.

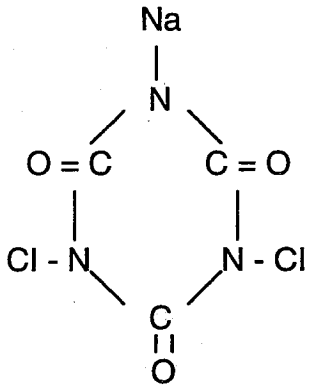
3.1.3 Relative molecular mass

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)]

2-207-67-7.

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 is approximately 0,9 g/cm^3.

3.3.3 Solubility in water

The solubility 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.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.6 Melting point

Not applicable.

3.3.7 Specific heat

(1 090 ± 40) J/kg · K at 20 °C.

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 a excess of water it liberates chlorine by hydrolysis.

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 product shall contain at least 62 percent by mass (% (*m/m*)) of available chlorine.

4.2 Impurities and main by-products

The water content shall be less than 3 % (*m/m*) of the product

The sodium chloride content shall be less than 0,05 % (*m/m*) of the product.

4.3 Toxic substances

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

The content of toxic substances shall conform to the requirements specified in Table 1.

Table 1 - Toxic substances

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 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. 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 determinated 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

Dissolve 24,8 g of $Na_2S_2O_3.5H_2O$ with water. Add 0,5 ml of chloroform as preservative, dilute to volume with water in a 1000 ml one-mark volumetric flask and mix thoroughly.

To standardize : weigh, to the nearest 0,1 mg, (160 ± 10) mg (m)of primary standard potassium dichromate into a tared glass beaker. Place the contents of the beaker in a 500 ml stoppered conical flask, add 100 ml of water and (2 ± 0,5) g of potassium iodide and stir to dissolve. Add (15 ± 1) ml of hydrochloric acid solution (diluted 1+1 by volume) swirl and allow to stand for 5 min. Titrate with the sodium thiosulfate solution until the solution is pale yellow. Add (5 ± 1) ml of starch solution (5.2.1.2.4) and titrate to the end point, i.e. to the disappearance of the blue-black colour. Record the volume (V) used.

The 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 equation :

$$c=\frac{m}{V\times 49{,}0317}$$

where

m is the mass, in milligrams, of potassium dichromate ($K_2Cr_2O_7$) weighed ;

V is the volume, in millilitres, of the sodium thiosulfate standard volumetric solution used ;

49,0317 is the molar mass, in grams per mole of potassium dichrormate ($\frac{1}{6}K_2Cr_2O_7$).

5.2.1.2.4 Starch solution, 1 % (m/m).

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

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), 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 percentage by mass (%) (m/m), is given by the following equation :

$$C_1=\frac{V_1\times 0{,}003545\times c}{m_0}\times 100$$

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

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 percentage by mass (% (m/m)) is given by the following equation :

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

where

m_1 is the mass, in grams, before drying ;

m_2 is the mass, in grams, after drying.

5.2.2.2 Sodium chloride

5.2.2.2.1 General

This method applies to products with sodium chloride contents in the range of 0 % (m/m) to 0,05 % (m/m).