SLOVENSKI STANDARD
oSIST prEN 12174:2020

01-julij-2020

Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev heksafluorosilikat

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhexafluorsilikat

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

Ta slovenski standard je istoveten z: **prEN 12174**

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

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ICS 71.100.80

Will supersede EN 12174:2013

English Version

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhexafluorsilikat

This draft European Standard is submitted to CEN members for enquiry. 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.

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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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Contents

Page

European foreword

This document (prEN 12174:2020) 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 CEN Enquiry.

This document will supersede EN 12174:2013.

In comparison with the previous edition, the following technical modifications have been made:

a) Modification of 7.3 on transportation regulations and labelling, adding the sentence “The user must be aware of the incompatibilities between transported products.”;

b) Modification of 7.4 on marking. The requirements of marking are also applied to the accompanying documents.

Introduction

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

a) this document 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 document 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 document is subject to regulation or control by National Authorities.

1 Scope

This document is applicable to sodium hexafluorosilicate used for treatment of water intended for human consumption. It describes the characteristics of sodium hexafluorosilicate and specifies the requirements and the corresponding test methods for sodium hexafluorosilicate. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use of sodium hexafluorosilicate (see Annex B).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 ISO 3696:1995, *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 4281, *Sodium hexafluorosilicate for industrial use — Determination of free acidity and total hexafluorosilicate content — Titrimetric method*

ISO 4793, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*

ISO 5444, *Sodium fluorosilicate for industrial use — Determination of loss in mass at 105 degrees C*

ISO 5993, *Sodium hydroxide for industrial use — Determination of mercury content — Flameless atomic absorption spectrometric method*

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

ISO 6353-1, *Reagents for chemical analysis — Part 1: General test methods*

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

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Description

4.1 Identification

4.1.1 Chemical name

Disodium hexafluorosilicate.

4.1.2 Synonym or commons name

Sodium silicofluoride, sodium hexafluorosilicate.

4.1.3 Relative molecular mass

188,055.

4.1.4 Empirical formula

Na_2SiF_6.

4.1.5 Chemical formula

Na_2SiF_6.

4.1.6 CAS-Registry Number [1]

16893-85-9.

4.1.7 EINECS reference [2]

240-934-8.

4.2 Commercial form

The product is a crystalline powder.

4.3 Physical properties

4.3.1 Appearance and odour

The product is a colourless, odourless fine crystalline powder.

4.3.2 Density

The particle density of the crystals is 2,8 g/cm³ at 20 °C.

The bulk density of the product is approximately 1,5 g/cm³ at 20 °C.

4.3.3 Solubility

The solubility of the product in water is 7 g/l at 20 °C.

4.3.4 Vapour pressure

Not applicable.

4.3.5 Boiling point at 100 kPa [3]

Not applicable.

4.3.6 Crystallization point

The product melts above 500 °C.

4.3.7 Specific heat

Not known.

4.3.8 Viscosity dynamic

Not applicable.

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[1] Chemical Abstracts Service Registry Number.

[2] European Inventory of Existing Commercial Chemical Substances.

[3] 100 kPa = 1 bar.

4.3.9 Critical temperature

Not applicable.

4.3.10 Critical pressure

Not applicable.

4.3.11 Physical hardness

Not applicable.

4.4 Chemical properties

The pH value of a saturated aqueous solution (7 g/l) of sodium hexafluorosilicate is approximately 10.

Sodium hexafluorosilicate reacts with acids to form hydrofluoric acid. For additional information on sodium hexafluorosilicate, see Annex A.

5 Purity criteria

5.1 General

This document specifies the minimum purity requirements for sodium hexafluorosilicate 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.

The national regulations allow users to clarify whether the product is of appropriate purity for the 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 and not stated in this document.

Limits have been given for impurities and chemicals 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.

5.2 Composition of commercial product

The content of sodium hexafluorosilicate shall not be less than a mass fraction of 98 % (Na_2SiF_6).

The concentration of sodium hexafluorosilicate shall be within ± 5 % of the manufacturer's declared value.

5.3 Impurities and main by-products

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

Table 1 — Impurities

Impurity		Limit in mass fraction in % of commercial product
Water – insoluble matter	max.	0,5
Moisture	max.	0,3

5.4 Chemical parameters

The product shall conform to the requirements specified in Table 2.

Table 2 — Chemical parameters

Parameter		Limit mg/kg of commercial product
Antimony (Sb)	max.	80
Arsenic (As)	max.	400
Cadmium (Cd)	max.	40
Chromium (Cr)	max.	400
Lead (Pb)	max.	400
Mercury (Hg)	max.	10
Nickel (Ni)	max.	400
Selenium (Se)	max.	80
NOTE Other chemical parameters and indicator parameters are not relevant in sodium hexafluorosilicate because the raw materials used in the manufacturing process are free of them. For parametric values of sodium hexafluorosilicate on trace metal content in drinking water, see [1].		

6 Test methods

6.1 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.

NOTE Sodium hexafluorosilicate presents a toxic hazard through inhalation of dust (see B.1).

6.2 Analyses

6.2.1 Main product

The sodium hexafluorosilicate content shall be determined in accordance with ISO 4281.

This standard includes the determination of free acid.

6.2.2 Impurities

6.2.2.1 Insoluble matters

6.2.2.1.1 Procedure

Weigh and transfer to a beaker 2 g of the sample, which has previously been dried at 105 °C to constant mass.

Dissolve in 500 ml of hot water. Generally, 15 min to 30 min is sufficient time.

Filter through a tared Gooch crucible or a tared fritted-glass filter of medium porosity (porosity P 16 according to ISO 4793). Wash with at least six separate 25 ml portions of boiling water, allowing the crucible to drain between washings. Dry the crucible or filter at 105 °C to constant mass.

6.2.2.1.2 Expression of results

The content of insoluble matters, W_1, expressed as mass fraction in % is given by the following formula:

$$C_1 = \frac{m_1 \text{ x } 100}{m_2} \quad (1)$$

where

m_1 is the mass, in grams, of the filter residue;

m_2 is the mass, in grams, of the test portion.

6.2.2.2 Moisture content

The content of moisture shall be determined in accordance with ISO 5444.

6.2.3 Chemical parameters

6.2.3.1 General

The content of chemical parameters shall be determined using the procedures specified in Table 3.

Table 3 — Procedures for the determination of chemical parameters

Element	Reference	Method	Wavelength nm	Flame
As	See 6.2.3.3	Hydride AAS	193,7	n.a
Sb	See 6.2.3.3	Hydride AAS	217,6	n.a
Cd	ISO 6353-1, MG 29 See 6.2.3.2	AAS	228,8	air-acetylene
Cr	ISO 6353-1, MG 29 See 6.2.3.2	AAS	357,8	air-acetylene
Pb	ISO 6353-1, MG 29 See 6.2.3.2	AAS	217,0 or 283,3	air-acetylene
Ni	ISO 6353-1, MG 29 See 6.2.3.2	AAS	232,0	Oxidising Air-acetylene
Se	See 6.2.3.3	Hydride AAS	196,0	n.a
Hg	In accordance with ISO 5993	Flameless AAS	253,6	n.a

n.a. = not applicable.
AAS = Atomic Absorption Spectrometry.