SLOVENSKI STANDARD
SIST EN 898:1999

01-april-1999

Kemikalije, ki se uporabljajo za pripravo pitne vode – Natrijev hidrogen karbonat

Chemicals used for treatment of water intended for human consumption - Sodium hydrogen carbonate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydrogencarbonat

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

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13.060.20	Pitna voda	Drinking water
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ICS 71.100.80

Descriptors: potable water, water treatment, chemical compounds, sodium carbonates, description, physical properties, chemical properties, impurities, toxic substances, tests, labelling, storage, utilization

English version

Chemicals used for treatment of water intended for human consumption - Sodium hydrogen carbonate

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Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydrogencarbonat

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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.

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

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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of an identical text or by endorsement, at the latest by August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

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.

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.

1 Scope

This European Standard is applicable to sodium hydrogen carbonate used for treatment of water intended for human consumption. It describes the characteristics of sodium hydrogen carbonate and specifies the requirements and the correponding test methods for sodium hydrogen carbonate. 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 746	Sodium carbonate for industrial use - Determination of matter insoluble in water at 50 degrees C
ISO 2199	Sodium hydrogen carbonate for industrial use - Determination of sodium hydrogen carbonate content - Titrimetric method
ISO 2460	Sodium hydrogen carbonate for industrial use - Determination of iron content - 1,10 - Phenanthroline photometric method
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 afer digestion with permanganate-peroxodisulfate
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

3 Description

3.1 Identification

3.1.1 Chemical name

Sodium hydrogen carbonate.

3.1.2 Synonym or common names

Sodium bicarbonate, bicarbonate of soda, baking soda.

3.1.3 Relative molecular mass

84,01.

3.1.4 Empirical formula

$NaHCO_3$.

3.1.5 Chemical formula

$NaHCO_3$.

3.1.6 CAS Registry Number [1)]

144-55-8.

3.1.7 EINECS reference [2)]

205-633-8.

3.2 Commercial forms

Sodium hydrogen carbonate as specified in this standard is technical water-free $NaHCO_3$. The product is available as powder or crystals.

3.3 Physical properties

3.3.1 Appearance

The product is a white powder or crystals, slightly hygroscopic.

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1) Chemicals Abstracts Service Registry Number.
2) European Inventory of Existing Commercial Chemical Substances.

3.3.2 Density

Solid : 2,2 g/cm^3.

Bulk density ranging from 0,5 kg/dm^3 to 1,1 kg/dm^3.

3.3.3 Solubility (in water)

95 g/l at 20 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa [3)]

Not applicable.

3.3.6 Melting point

Not applicable. Product decomposes at 50 °C.

3.3.7 Specific heat

1,197 kJ/kg∀K.

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

The hardness of solid sodium hydrogen carbonate is given as 1,5 to 2 on the Mohs'scale of hardness.

[3)] 100 kPa = 1 bar.

3.4 Chemical properties

Sodium hydrogen carbonate reacts exothermically with acids with formation of carbon dioxide (CO_2).

4 Purity criteria

4.1 General

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.

4.2 Composition of commercial product

The product shall contain not less than 98,5 % (*m/m*) of $NaHCO_3$.

4.3 Impurities and main by-products

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

The concentration limits refer to $NaHCO_3$.

Table 1 : Impurities

Impurity		Limit in mg/kg of $NaHCO_3$
Iron(II) [1]	max.	5
Insolubles [2]	max.	200
1) Iron(II) can cause organoleptic problems.		
2) Indicates the presence of foreign matter.		

4.4 Toxic substances

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

The content of toxic substances shall conform to the requirements specified in table 2.

The concentration limits are specified in milligrams per kilogram of $NaHCO_3$.

Table 2 : Toxic substances

Element		Limit in mg/kg of $NaHCO_3$
Arsenic (As)	max.	2
Cadmium (Cd)	max.	2
Chromium (Cr)	max.	2
Mercury (Hg)	max.	0,1
Nickel (Ni)	max.	2
Lead (Pb)	max.	2
NOTE : Antimony, selenium, cyanides, pesticides and polycyclic aromatic hydrocarbons are not relevant toxic substances as listed in Directive 80/778/EEC because they are not likely to be found in the raw materials.		

5 Test methods

5.1 Sampling

Take a sample in accordance with ISO 8213 and taking account of ISO 3165 and also ISO 6206.

5.2 Analyses

5.2.1 Main product

The $NaHCO_3$ content shall be determined by titration with a standard volumetric acid solution in accordance with ISO 2199.

5.2.2 Impurities

5.2.2.1 Iron

The iron content shall be determined by the spectrometric method with 1,10-phenanthroline in accordance with ISO 2460.

5.2.2.2 Insolubles

The percentage by mass (% (*m*/*m*)) of the insolubles in water shall be determined at 50 °C in accordance with ISO 746 replacing sodium carbonate by sodium hydrogen carbonate.

5.2.3 Toxic substances

5.2.3.1 General

The concentrations of toxic substances, except for mercury, shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES).

5.2.3.2 Arsenic

The arsenic concentration shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

5.2.3.3 Cadmium

The cadmium concentration shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

5.2.3.4 Chromium

The chromium concentration shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

5.2.3.5 Mercury

The mercury concentration shall be determined by cold vapour atomic absorption spectrometry in accordance with ISO 5666-1 (see B.2).

5.2.3.6 Nickel

The nickel concentration shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

5.2.3.7 Lead

The lead concentration shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

6 Labelling - Transportation - Storage

6.1 Means of delivery

Sodium hydrogen carbonat can be delivered in bulk, bulk bags or in bags.

In order that the purity of the product is not affected, the means of delivery shall not have been used previously for any different product or it shall have been specially cleaned and prepared before use.