SLOVENSKI STANDARD
SIST EN 15040:2014

01-junij-2014

Nadomešča:
SIST EN 15040:2006

Kemikalije, ki se uporabljajo za pripravo pitne vode - Sredstva proti apnencu na membranah - Fosfonske kisline in soli

Chemicals used for treatment of water intended for human consumption - Antiscalants for membranes - Phosphonic acids and salts

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Antiscalants für Membranen - Phosphonsäuren und deren Salze

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Produits antitartre pour membranes - Acides phosphoniques et sels

Ta slovenski standard je istoveten z: **EN 15040:2014**

ICS:

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

SIST EN 15040:2014 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15040

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ICS 71.100.80

Supersedes EN 15040:2006

English Version

Chemicals used for treatment of water intended for human consumption - Antiscalants for membranes - Phosphonic acids and salts

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Produits antitartre pour membranes - Acides phosphoniques et sels

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Antiscalants für Membranen - Phosphonsäuren und deren Salze

This European Standard was approved by CEN on 5 January 2014.

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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 CEN-CENELEC Management Centre 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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Foreword

This document (EN 15040:2014) 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of an identical text or by endorsement, at the latest by September 2014 and conflicting national standards shall be withdrawn at the latest by September 2014.

This document supersedes EN 15040:2006.

Significant technical differences between this edition and EN 15040:2006 are as follows:

- replacement of warning and safety precautions notes by labelling according to REGULATION (EC) No 1272/2008.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

WARNING – The use of this standard may involve hazardous materials, operations and equipment. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

Introduction

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

a) this European Standard provides no information as to whether the products 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 these products remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the products in any of the Member States of the EU or EFTA. The use of the products covered by this European Standard is subject to regulation or control by National Authorities.

1 Scope

This European Standard is applicable to phosphonic acids and salts used as antiscalants for membranes in the treatment of water intended for human consumption. It describes the characteristics and specifies the requirements and the corresponding analytical methods for phosphonic acids and salts. It gives information on their use as antiscalants for membranes in water treatment. It also determines the rules relating to safe handling and use (see Annex B).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

EN ISO 5961, *Water quality - Determination of cadmium by atomic absorption spectrometry (ISO 5961)*

EN ISO 11885, *Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885)*

EN ISO 11969, *Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique) (ISO 11969)*

EN ISO 12846, *Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846)*

ISO 2997, *Phosphoric acid for industrial use — Determination of sulphate content — Method by reduction and titrimetry*

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

ISO 3360, *Phosphoric acid and sodium phosphates for industrial use (including foodstuffs) — Determination of fluorine content — Alizarin complexone and lanthanum nitrate photometric method*

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

ISO 6703-1, *Water quality — Determination of cyanide — Part 1: Determination of total cyanide*

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*

ISO 9965, *Water quality — Determination of selenium — Atomic absorption spectrometric method (hydride technique)*

3 Description

3.1 Identification

3.1.1 Chemical name

a) Morpholinomethane diphosphonic acid,

b) Aminotrismethylene phosphonic acid,

c) Hydroxyethane diphosphonic acid,

d) Diethylene triamine pentamethylene phosphonic acid,

e) Ethylene diamine tetramethylene phosphonic acid,

f) Ethanol aminobismethylene phosphonic acid,

g) Phosphonobutane tricarboxylic acid,

h) Hexamethylenediamine tetramethylene phosphonic acid.

These acids can also be used as sodium, potassium, and ammonium salts.

3.1.2 Synonym or common names

a) MOMP,

b) ATMP,

c) HEDP,

d) DETAPMP,

e) EDATMP,

f) EABMP,

g) PBTC,

h) HDTMP

3.1.3 Relative molecular mass

a) 260,15

b) 299,04

c) 206,02

d) 572,95

e) 436,06

f) 249,02

g) 270,82

h) 492,23

3.1.4 Empirical formula

a) $C_5H_{13}O_7P_2N$,

b) $C_3H_{12}O_9P_3N$,

c) $C_2H_8O_7P_2$,

d) $C_9H_{28}O_{15}N_3P_5$,

e) $C_6H_{20}O_{12}N_2P_4$,

f) $C_4H_{13}O_7P_2N$,

g) $C_7H_{11}O_9P$,

h) $C_{10}H_{28}N_2O_{12}P_4$.

3.1.5 Chemical formula

a) $C_5H_{13}O_7P_2N$,

b) $C_3H_{12}O_9P_3N$,

c) $C_2H_8O_7P_2$,

d) $C_9H_{28}O_{15}N_3P_5$,

e) $C_6H_{20}O_{12}N_2P_4$,

f) $C_4H_{13}O_7P_2N$,

g) $C_7H_{11}O_9P$,

h) $C_{10}H_{28}N_2O_{12}P_4$.

3.1.6 CAS Registry Number [1)]

a) 32545-75-8,

b) 6419-19-8,

c) 2809-21-4,

d) 15827-60-8,

e) 1429-50-1,

f) 5995-42-6,

g) 37971-36-1,

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1) Chemical Abstracts Service Registry Number.

h) 23605-74-5.

3.1.7 EINECS reference [2)]

a) 251-094-7,

b) 229-146-5,

c) 220-552-8,

d) 239-931-4,

e) 215-851-5,

f) 227-833-4,

g) 253-733-5,

h) 245-781-0.

3.2 Commercial forms

The phosphonic acids and salts are available in a number of different forms (see 3.3.1).

Different commercial forms, solids or dissolved in water are possible. All concentrations mentioned refer to the active matter (active acid or active salt) and shall be calculated accordingly.

3.3 Physical properties

3.3.1 Appearance

Solid: The product is a yellowish or white powder or granulate.

Liquid: The product is a colourless, light yellow, pale yellow, amber or brown solution.

3.3.2 Density

Solid: The bulk density of the product varies from 500 g/dm^3 to 1200 g/dm^3.

Liquid: The density of solution is typically 1,1 g/ml to 1,46 g/ml for a product concentration from mass fraction 22 % to 60 % of active matter at 20 °C.

3.3.3 Solubility in water

Solid: the solubility is approximately 300 g/l solution (Na_4HEDP) at 25 °C, and approximately 420 g/l solution (Na_7DETAPMP) at 25 °C.

Liquid: it is miscible in all proportions with pure water.

3.3.4 Vapour pressure

Not applicable.

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2) European Inventory of Existing Commercial Chemical Substances.

3.3.5 Boiling point at 100 kPa [3)]

Not applicable.

3.3.6 Melting point

Not applicable.

3.3.7 Specific heat

Not known.

3.3.8 Viscosity (dynamic)

For the solid product it is not applicable.

For the liquid the viscosity is equal from 4 mPa.s to 170 mPa.s for a product concentration of 50 g/l.

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 phosphonic acids and solutions of phosphonic acid salts have acidic to alkaline reactions. The pH value of an aqueous solution of a mass fraction of 1 % is approximately between 2 to 12.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for phosphonic acids and salts used as antiscalants for membranes for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the products. 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 these products 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 products not stated in this product standard.

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.

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3) 100 kPa = 1 bar.