SLOVENSKI STANDARD
SIST EN 17034:2018

01-marec-2018

Nadomešča:
SIST EN 881:2005
SIST EN 883:2005

Kemikalije, ki se uporabljajo za pripravo pitne vode - Aluminijev klorid brezvodni, aluminijev klorid osnovni, dialuminijev klorid pentahidroksid in aluminijev klorid hidroksid sulfat

Chemicals used for treatment of water intended for human consumption - Aluminium chloride anhydrous, aluminium chloride basic, dialuminium chloride pentahydroxide and aluminium chloride hydroxide sulfate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Aluminiumchlorid, wasserfrei, Aluminiumchlorid, basisch, Dialuminiumchloridpentahydroxid und Aluminiumchloridhydroxidsulfat

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Chlorure d'aluminium anhydre, chlorure d'aluminium basique, pentahydroxychlorure de dialuminium et hydroxychlorosulfate d'aluminium

Ta slovenski standard je istoveten z: **EN 17034:2018**

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

EN 17034

January 2018

ICS 71.100.80

Supersedes EN 881:2004, EN 883:2004

English Version

Chemicals used for treatment of water intended for human consumption - Aluminium chloride anhydrous, aluminium chloride basic, dialuminium chloride pentahydroxide and aluminium chloride hydroxide sulfate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Chlorure d'aluminium anhydre, chlorure d'aluminium basique, pentahydroxychlorure de dialuminium et hydroxychlorosulfate d'aluminium

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This European Standard was approved by CEN on 30 November 2017.

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 CEN-CENELEC Management Centre 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 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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 17034:2018) 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 July 2018 and conflicting national standards shall be withdrawn at the latest by July 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 883:2004, EN 881:2004.

Significant technical differences between this edition and EN 883:2004 and EN 881:2004 are as follows:

a) adding the product aluminium chloride basic and the information related to it;

b) deletion of the reference to EU Directive 80/778/EEC of 15 July 1980;

c) Annex A is informative;

d) Annex B is normative.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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 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 aluminium chloride anhydrous, aluminium chloride basic, dialuminium chloride pentahydroxide and aluminium chloride hydroxide sulfate used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements of aluminium chloride basic, polyaluminium chloride hydroxide and polyaluminium chloride hydroxide sulfate and refers to the corresponding analytical methods. It gives information for their use in water treatment. It also gives the usable rules relating to safe handling and use of these aluminium salts (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 1302, *Chemicals used for treatment of water intended for human consumption — Aluminium-based coagulants — Analytical methods*

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

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

3 Description

3.1 Identification

3.1.1 Chemical names

a) Aluminium chloride anhydrous

b) Aluminium chloride, basic

c) Dialuminium chloride pentahydroxide

d) Aluminium chloride hydroxide sulfate

3.1.2 Synonym or common names

a) Aluminium (III) chloride, Aluminium trichloride

b) Aluminium chloride, polyaluminium chloride, polyaluminium chloride hydroxide PAC, PACl

NOTE In French, the term “Polychlorure d'aluminium” is deprecated.

c) Aluminium chloro hydrate, Polyaluminium chloride

d) Polyaluminium chloride, PAC; polyaluminium chloride sulfate, PACS

3.1.3 Relative molecular mass

Variable (see 3.1.4).

3.1.4 Empirical formula

a) $AlCl_3$

b) $Al(OH)_aCl_b$ (a+b) = 3 a > 0

c) $Al_2(OH)_5Cl$

d) $Al(OH)_aCl_{(3-a-2b)}(SO_4)_b$ a = 0,6-2,5 b = 0,05-0,5 (a+b)/2 < 2,4

3.1.5 Chemical formula

Variable (see 3.1.4).

3.1.6 CAS Registry Number [1)]

(a) 7446-70-0

(b_1) 1327-41-9

(b_2) 14215-15-7 (a = 1 b = 2)

(b_3) 10284-64-7 (a = 2, b = 1)

(c) 12042-91-0

(d) 39290-78-3

3.1.7 EINECS reference [2)]

(a) 231-208-1

(b_1) 215-477-2

(b_2) 238-071-7

(b_3) 233-632-2

(c) 234-933-1

(d) 254-400-7

3.2 Commercial forms

Except aluminium chloride anhydrous, which is solid, these products are generally available as solutions.

3.3 Physical properties

3.3.1 Appearance

The product is colourless to yellow.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3.3.2 Density

The density depends on the particular composition, especially the aluminium ion content, expressed as mass fraction of aluminium (Al %).

Typical values:

a) Aluminium chloride anhydrous, 2,5 g/ml

b) Aluminium chloride solution, 1,30 g/ml for 5,8 % Al

c) Polyaluminium chloride solution, 1,35-1,40 g/ml for 9,0 % Al

d) Aluminium chloride hydroxide sulfate solution, 1,20 – 1,25 g/ml for 5,3 % Al

3.3.3 Solubility

All products in solution are fully miscible with water. Aluminium chloride anhydrous will react in water with a solubility of 45,8 g/100 ml (20 °C).

NOTE Depending on the particular product, dilute solutions can hydrolyze and form a precipitate.

3.3.4 Vapour pressure

The vapour pressure for aluminium chloride anhydrous is 133,3 Pa (99 °C).

3.3.5 Boiling point at 100 kPa [3)]

The boiling point for aluminium chloride anhydrous is 182,7 °C.

3.3.6 Crystallization point

Typical values for solutions:

a) Aluminium chloride solution, - 20 °C for 5,8 % Al

b) Polyaluminium chloride hydroxide solution, −20°C for 9,0 % Al

c) Dialuminium chloride pentahydroxide solution; 0 °C for 12,5 % Al

d) Aluminium chloride hydroxide sulfate solution, −10 °C for 5,3 % Al

3.3.7 Specific heat

Not known.

3) 100 kPa = 1 bar.

3.3.8 Viscosity (dynamic)

Typical values:

a) Aluminium chloride anhydrous, 0,35 mPa · s (197 °C)

b) Aluminium chloride solution, 10 mPa · s to 30 mPa · s for 5,8 % Al (20 °C)

c) Polyaluminium chloride hydroxide solution, 10 mPa · s to 50 mPa · s for 9,0 % Al (20 °C)

d) Dialuminium chloride pentahydroxide solution; 10 mPa · s to 30 mPa · s for 12,5 % Al (20 °C)

e) Aluminium chloride hydroxide sulfate solution, 10 mPa · s to 30 mPa · s for 5,3 % Al (20 °C)

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

Aluminium chloride anhydrous will react in water.

Aluminium chloride basic, dialuminium chloride pentahydroxide and aluminium chloride hydroxide sulfate hydrolyse are acidic liquids which hydrolyse and form a precipitate of aluminium hydroxide when diluted beyond a particular level.

Since aluminium compounds are amphoteric in nature, the solubility of aluminium depends on the pH value and the products should be used within an appropriate pH range.

NOTE A characteristic of these products is their high tendency to hydrolyze which restricts their use; this tendency results from the particular oligomeric or polymeric composition.

These products vary in their relative basicity (mole ratio OH/3Al), the percentage of chloride and sulfate ions present and in their method of manufacture.

These variations can affect their performance in the water treatment plant. Special water plant requirements regarding, but not limited to, such items as: organic matter removal, residual aluminium levels and working pH values should be specified when possible, so that the product which best fits the need can be offered.

4 Purity criteria

4.1 General

This document specifies the minimum purity requirements for aluminium chloride anhydrous, aluminium chloride basic, dialuminium chloride pentahydroxide and aluminium chloride hydroxide sulfate 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.