



SLOVENSKI STANDARD

oSIST prEN 17034:2016

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Kemikalije, ki se uporabljajo za pripravo pitne vode - Polialuminijev klorid hidroksid in polialuminijev klorid hidroksid sulfat

Chemicals used for treatment of water intended for human consumption - Polyaluminium chloride hydroxyde and polyaluminium chloride hydroxide sulfate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Polyaluminiumchloridhydroxid und Polyaluminiumchloridhydroxidsulfat

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Polyhydroxychlorure d'aluminium et polyhydroxychlorosulfate d'aluminium

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English Version

Chemicals used for treatment of water intended for human consumption - Polyaluminium chloride hydroxyde and polyaluminium chloride hydroxide sulfate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Polyhydroxychlorure d'aluminium et polyhydroxychlorosulfate d'aluminium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Polyaluminiumchloridhydroxid und Polyaluminiumchloridhydroxidsulfat

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

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prEN 17034:2016 (E)**European foreword**

This document (prEN 17034:2016) 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 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.

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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.

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prEN 17034:2016 (E)**1 Scope**

This document is applicable to aluminium chloride basic, polyaluminium chloride hydroxide and polyaluminium 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 determines the 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 basic;
- b) Polyaluminium chloride hydroxide;
- c) Polyaluminium chloride hydroxide sulfate.

3.1.2 Synonym or common names

- a) Aluminium chloride;
- b) Polyaluminium chloride, PAC, PACl

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

- c) Polyaluminium chloride, PAC; polyaluminium chloride sulfate, PACS.

3.1.3 Relative molecular mass

Variable (see 3.1.4).

3.1.4 Empirical formula

- a) $\text{Al}(\text{OH})_a\text{Cl}_b$ with $(a + b) = 3$ and a ranges from 0 to 1,05;

- b) $\text{Al(OH)}_a\text{Cl}_b$ with $(a + b) = 3$ and a greater than 1,05; also includes e.g. $\text{Al}_2(\text{OH})_5\text{Cl}$;
- c) $\text{Al(OH)}_a\text{Cl}_b(\text{SO}_4)_c$ with $(a + b + 2c) = 3$ and a greater than 1,05.

3.1.5 Chemical formula

Variable (see 3.1.4).

3.1.6 CAS Registry Number ¹⁾

- (a₁) a and b variable: 1327-41-9 with a ranges from 0 to 1,05;
- (a₂) $a = 1, b = 2$: 14215-15-7
- (b₁) a and b variable: 1327-41-9 with a greater than 1,05;
- (b₂) $a = 2,5; b = 0,5$: 12042-91-0;
- (c) a, b and c variable: 39290-78-3 with a greater than 1,05.

3.1.7 EINECS reference ²⁾

- (a₁) 215-477-2;
- (a₂) 238-071-7;
- (b₁) 215-477-2;
- (b₂) 234-933-1;
- (c) 254-400-7.

3.2 Commercial forms

These products are generally available as solutions.

3.3 Physical properties

3.3.1 Appearance

The product is colourless to yellow.

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: 1,3 g/ml for 5,8 % Al;
- b) Polyaluminium chloride hydroxide: 1,35 g/ml to 1,40 g/ml for 9,5 % Al;
- c) Polyaluminium chloride hydroxide sulfate:
1,38 g/ml to 1,40 g/ml for 9,3 % Al;

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

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1,18 g/ml to 1,22 g/ml for 5,3 % Al.

3.3.3 Solubility

All basic aluminium chlorides, polyaluminium chloride hydroxides and polyaluminium chloride hydroxide sulfates are fully miscible with water.

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

3.3.4 Vapour pressure

Not known.

3.3.5 Boiling point at 100 kPa³⁾

Not known.

3.3.6 Crystallization point

Typical values for solutions:

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

b) Polyaluminium chloride hydroxide:

- 20 °C for 9,5 % Al;

0 °C for 12,4 % Al;

c) Polyaluminium chloride hydroxide sulfate:

- 10 °C to - 15 °C for 5,3 % Al.

3.3.7 Specific heat

Not known.

3.3.8 Viscosity (dynamic)

Typical values for solutions at 20 °C:

a) Aluminium chloride solution: 10 mPa·s for 5,8 % Al;

b) Polyaluminium chloride hydroxide: 10 mPa·s to 50 mPa·s for 9,5 % Al;

c) Polyaluminium chloride hydroxide sulfate: 3 mPa·s to 10 mPa·s for 5,3 % Al.

3) 100 kPa = 1 bar.

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

Basic aluminium chloride, polyaluminium chloride hydroxide and polyaluminium chloride hydroxide sulfate 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 may 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 basic aluminium chloride, polyaluminium chloride hydroxide and polyaluminium 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.

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 document.

Limits have been given for impurities and chemical 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.

4.2 Composition of commercial product

The concentration of active matter (aluminium ion content) in the commercial product expressed as grams per kilogram of product shall be within $\pm 3\%$ of the manufacturer's declared values.

NOTE The concentration of water-soluble aluminium in commercial products varies. Typical values of aluminium content in the products can be between 42 g/kg and 124 g/kg.