SIST

SLOVENSKI STANDARD
SIST EN 935:2005

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Nadomešča:

SIST EN 935:2002

Kemikalije, ki se uporabljajo za pripravo pitne vode – Aluminijev železov (III) klorid (monomerni) in aluminijev železov (III) klorid hidroksid (monomerni)

Chemicals used for treatment of water intended for human consumption - Aluminium iron (III) chloride (monomeric) and aluminium iron(III) chloride hydroxide (monomeric)

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Aluminium-Eisen(III)chlorid (Monomer) und Aluminium-Eisen(III)hydroxidchlorid (Monomer)

Produits chimiques utilisés pour le traitement de l'eau destinée a la consommation humaine - Chlorure et hydroxychlorure d'aluminium et de fer (III) (monomeres)

Ta slovenski standard je istoveten z: **EN 935:2004**

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13.060.20	Pitna voda	Drinking water
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EUROPEAN STANDARD

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English version

Chemicals used for treatment of water intended for human consumption - Aluminium iron(III) chloride (monomeric) and aluminium iron(III) chloride hydroxide (monomeric)

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This European Standard was approved by CEN on 30 September 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Contents

Foreword

This document (EN 935:2004) 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 May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 935:2001.

Significant technical differences between this edition and EN 935:2001 are as follows:

a) replacement of the reference to EU Directive 80/778/EEC of July, 15 1980 with the latest Directive in force (see[1]);

b) expansion of annex A by addition of A.2 "quality of commercial product".

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 standard 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 iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements for aluminium iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) and refers to the corresponding test methods. It gives information on their use in water treatment. It also determines the rules relating to safe handling and use of aluminium iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) (see annex B).

2 Normative references

The following referenced documents are indispensable for the application 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 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 name

a) Aluminium iron (III) chloride (monomeric);

b) Aluminium iron (III) chloride hydroxide (monomeric).

3.1.2 Synonym or common names

For aluminium iron (III) chloride hydroxide (monomeric): bauxite or clay hydroxide chloride.

3.1.3 Relative molecular mass

Variable (see 3.1.4).

3.1.4 Empirical formula

$Al_xFe_{1-x}(OH)_aCl_b$ with $(a + b) = 3$ and x = 0,67 to 0,99 for aluminium iron chlorides

x = 0,80 to 0,99 for aluminium iron chloride hydroxides

a = 0 to 1,05

b = 3 to 1,95

a = 0 for aluminium iron(III) chloride (monomeric) products, and these products normally have a detectable free acidity (see 5.2).

3.1.5 Chemical formula

Variable (see 3.1.4).

3.1.6 CAS Registry Number[1)]

The following is a list of CAS Registry Numbers for products or their components.

$AlCl_3$: 7446-70-0.

$FeCl_3$: 7705-08-0.

$Al(OH)_aCl_b$: 1327-41-9 with $(a + b) = 3$ and a less than 1,05.

$Al(OH)Cl_2$: 14215-15-7.

3.1.7 EINECS reference[2)]

The following is a list of EINECS reference numbers for products or their components.

$AlCl_3$: 231-208-1.

$FeCl_3$: 231-729-4.

$Al(OH)_aCl_b$: 215-477-2.

$Al(OH)Cl_2$: 238-071-7.

3.2 Commercial form

The products are available as liquids.

3.3 Physical properties

3.3.1 Appearance

The products are yellow to brown liquids.

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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 a mass fraction of aluminium in %.

Typical value: 1,3 g/ml for 5,3 % Al.

3.3.3 Solubility in water

Aluminium iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) are fully miscible with water.

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

3.3.4 Vapour pressure at 20 °C

Not known.

3.3.5 Boiling point at 100 kPa[3)]

Not known.

3.3.6 Crystallization point

Typical value is - 20 °C for 5,3 % Al.

3.3.7 Specific heat

Not known.

3.3.8 Viscosity (dynamic)

Typical value is 20 mPa·s for 5,3 % Al at 20 °C.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

3) 100 kPa = 1 bar.

3.4 Chemical properties

Aluminium iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) are acidic liquids which hydrolyse and form a precipitate of aluminium hydroxide and iron hydroxide when diluted beyond a particular concentration.

NOTE The solubility of aluminium and the solubility of iron depend on the pH value and the product should be used within an appropriate pH range.

4 Purity criteria

4.1 General

This document specifies the minimum purity requirements for aluminium iron (III) chloride (monomeric) and aluminium iron (III) chloride hydroxide (monomeric) used 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.

NOTE 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 chemical parameters where these are likely to be present in significant quantities from the current production processes and raw materials. If the production process or raw materials leads 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) expressed as grams per kilogram of product (Al g/kg) shall be greater than 40 g/kg. The contents of aluminium and iron shall be within ± 3 % of the manufacturer's declared values. The ratio Fe/Al shall be less than 0,50 for aluminium iron (III) chloride hydroxides (monomeric) and less than 1,0 for aluminium iron (III) chlorides (monomeric).

The relative basicity, expressed as the mole ratio OH/3(Al + Fe), shall be within the range 0 to 0,35 for aluminium iron (III) chloride hydroxides (monomeric). For aluminium iron (III) chloride (monomeric), the basicity is zero. Aluminium iron (III) chloride (monomeric) often have a free acidity.

4.3 Impurities and main by-products

The content of insoluble matter shall be lower than 25 g/kg (Al + Fe).

4.4 Chemical parameters

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

Table 1 — Chemical parameters

Parameter		Limit mg/kg (Al + Fe)		
		Type 1	Type 2	Type 3
Arsenic (As)	max.	14	40	100
Cadmium (Cd)	max.	3	50	100
Chromium (Cr)	max.	30	700	1 000
Mercury (Hg)	max.	4	10	20
Nickel (Ni)	max.	20	700	1 000
Lead (Pb)	max.	40	200	800
Antimony (Sb)	max.	20	40	120
Selenium (Se)	max.	20	40	120

NOTE Cyanide (CN^-) is usually not relevant because of the acidity of the product. Pesticides and polycyclic aromatic hydrocarbons are not relevant since the raw materials used in the manufacturing process are free of them.

For maximum impact of these products on trace metal content in drinking water (see A.2).

5 Test methods

5.1 Sampling

5.1.1 General

Observe the general rules of ISO 3165 and take into account ISO 6206

5.1.2 Sampling from drums and bottles

5.1.2.1 General

5.1.2.1.1 Mix the contents of each container to be sampled by shaking the container, by rolling it or by rocking it from side to side, taking care not to damage the container or spill any of the liquid.

5.1.2.1.2 If the design of the container is such (for example, a narrow-necked bottle) that it is impracticable to use a sampling implement, take a sample by pouring after the contents have been thoroughly mixed. Otherwise, proceed as described in 5.1.2.1.3.

5.1.2.1.3 Examine the surface of the liquid. If there are signs of surface contamination, take samples from the surface as described in 5.1.2.2; otherwise, take samples as described in 5.1.2.3.

5.1.2.2 Surface sampling

Take a sample using a suitable ladle. Lower the ladle into the liquid until the rim is just below the surface, so that the surface layer runs into it. Withdraw the ladle just before it fills completely and allow any liquid adhering to the ladle to drain off. If necessary, repeat this operation so that, when the other selected containers have been sampled in a similar manner, the total volume of sample required for subsequent analysis is obtained.