SLOVENSKI STANDARD
SIST EN 882:1999

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Kemikalije, ki se uporabljajo za pripravo pitne vode – Natrijev aluminat

Chemicals used for treatment of water intended for human consumption - Sodium aluminate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumaluminat

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

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English version

Chemicals used for treatment of water intended for human consumption - Sodium aluminate

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumaluminat

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Comittee 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of an identical text or by endorsement, at the latest by August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 describes the characteristics and specifies the requirements of sodium aluminate used for treatment of water intended for human consumption and gives reference to the analytical methods. 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 place 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.

prEN 1302	Chemicals used for treatment of water intended for human consumption - Aluminium based coagulants - Analytical methods - purity classification
ISO 3165	Sampling of chemical products for industrial use - Safety in sampling
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

Aluminium sodium oxide

3.1.2 Synonym or common names

Sodium aluminate

3.1.3 Relative molecular mass

82 (for $NaAlO_2$)

3.1.4 Empirical formula

$NaAlO_2 \cdot 0{,}1\ Na_2O \cdot nH_2O$ (n = 0,3 to 0,4)

3.1.5 Chemical formula

$NaAlO_2$

3.1.6 CAS Registry Number[1)]

11138-49-1

3.1.7 EINECS reference[2)]

234-391-6

3.2 Commercial form

Sodium aluminate is available as solids (powder or granules) or solutions.

3.3 Physical properties

3.3.1 Appearance

Solid : white powder or granules.

Solution : colourless to yellow liquid.

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1) Chemical Abtracts Service Registry Number.
2) European inventory of Existing Commercial chemical Substances.

3.3.2 Density

Absolute density of solids : 2,35 g/cm^3

Tamped bulk density (powder) : 1 g/cm^3 to 1,2 g/cm^3 (depends on grain size).

Density of solutions : 1,5 g/ml for a solution containing 10 % of active matter, expressed as aluminium percent by mass in the product (Al 10 % (*m/m*)).

3.3.3 Solubility

Sodium aluminate is soluble in water to yield solutions of up to 12,7 Al % (*m/m*) at 20 °C (concentration higher than 400 g/l).

NOTE : Depending on temperature and degree of dilution, solutions of sodium aluminate can hydrolyse and form a precipitate.

3.3.4 Vapour pressure

Solid : not applicable.

Solution : not known.

3.3.5 Boiling point at 100 kPa[3)]

Solid : not applicable.

Solution : not known.

3.3.6 Melting or crystallization point

Solid : melting point : ≈ 1 650 °C

Solution : typical values for crystallization point range between - 15 °C and - 25 °C.

3.3.7 Specific heat

Not known.

3.3.8 Viscosity (dynamic)

Typical values of dynamic viscosity for sodium aluminate solutions, containing 10 Al % (*m/m*) and 12,7 Al % (*m/m*) are given in table 1.

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3) 100 kPa = 1 bar

Table 1 : Viscosity

Temperature °C	Viscosity mPa·s	
	10 Al % (*m/m*)	12,7 Al % (*m/m*)
- 5	1 250	15 000
0	650	7 000
5	360	2 850
10	200	1 650
15	140	900
20	120	560

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Solid : not known.

Solution : not applicable.

3.4 Chemical properties

Sodium aluminate solutions are highly alkaline. They hydrolyse and form a precipitate of aluminium hydroxide when diluted beyond a particular level or neutralized.

NOTE : Since aluminium compounds are amphoteric, they should to be used within a particular pH range.

When dissolved in potable water, calcium is partially precipitated with aluminium hydroxide.

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 content of active matter, expressed as aluminium percent by mass in the product (Al % (*m/m*)) shall not be outside the range of values specified as follows :

- Solid : 27,5 Al % (*m/m*) to 29,1 Al % (*m/m*);

- Solution : 10 Al % (*m/m*) to 13,2 Al % (*m/m*).

4.3 Impurities and main by-products

The contents of impurities shall conform to the requirements specified in table 2.

If iron (III) is present, it will usually be removed in the treatment process.

Table 2 : Impurities

Impurity		Limit g/kg of Al
Iron (Fe)	max.	0,8
Insoluble matter (solid product)	max.	8

4.4 Toxic substances

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

The content of toxic substances shall conform to the requirements specified in table 3.

Table 3 : Toxic substances

Parameter		Limit mg/kg of Al		
		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 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.				