ANSI/AWWA B405-16
(Revision of ANSI/AWWA B405-06)

American Water Works Association

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AWWA Standard

Sodium Aluminate

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AWWA Standard

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Committee Personnel

The AWWA Standards Committee on Iron Salts, Aluminum Salts, and Related Coagulant Aids, which reviewed and approved this standard, had the following personnel at the time of approval:

Glenn R. Evers, *Chair*
Jan J. Pavlicek, *Vice-Chair*

General Interest Members

M.B. Alvarez, CH2M, Coral Gables, Fla.	(AWWA)
K-K Au, FMC Global Peroxygens, Naperville, Ill.	(AWWA)
J.D. Edwards, Westerville, Ohio	(AWWA)
G.R. Evers, IS2 LLC, Hockessin, Del.	(AWWA)
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P.H. Hargette, Black & Veatch Corporation, Greenville, S.C.	(AWWA)
S. Heidary-Monfared, EIT, Edmonton, Alta, Canada	(AWWA)
G.A. Iversen, Hazen and Sawyer, Raleigh, N.C.	(AWWA)
D. Larson,* St. Louis, Mo.	(AWWA)
C.B. Lind, Mauser USA LLC, East Brunswick, N.J.	(AWWA)
J.W. Patterson, J.W. Patterson Environmental Consultants, Chicago, Ill.	(AWWA)
S.J. Posavec,* Standards Group Liaison, AWWA, Denver, Colo.	(AWWA)
B.H. Wilder, Daytona Beach, Fla.	(AWWA)

Producer Members

T.A. Badwak, USALCO LLC, Baltimore, Md.	(AWWA)
J.P. Crass, Ventura, Calif.	(AWWA)
D.E. Gordon, QC Corporation, Baltimore, Md.	(AWWA)
L.N. Hjersted† Agro Iron, Lakeland, Fla.	(AWWA)
B. Keogh, B.K. Water Technologies, Dundas, Ont., Canada	(AWWA)
J.J. Pavlicek, Detroit, Mich.	(AWWA)
K.E. Roehl, Chemtrade Logistics, Ballwin, Mo.	(AWWA)
G. Shuler, Yantis, Texas	(AWWA)
B. Wodetzki, PVS Chemicals Inc., Valparaiso, Ind.	(AWWA)

* Liaison, nonvoting
†Alternate

User Members

J.M. Carroll, East Lansing-Meridian Water, East Lansing, Mich. (AWWA)
L.V. Landry, Consolidated Waterworks/Sewerage District Number 1, Princeton, La. (AWWA)
C.A. Owen, Tampa Bay Water, Clearwater, Fla. (AWWA)
B.K. Parsons, City of Greensboro, Greensboro, N.C. (AWWA)
R.S. Smith, Louisville Water Co., Louisville, Ky. (AWWA)
J.S. Trotter, City of Bloomington Utilities, Bloomington, Ind. (AWWA)

Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA B405.*

I. Introduction.

I.A. *Background.* Sodium aluminate ($Na_2Al_2O_4$) is used to improve hardness reduction and coagulation when softening water with lime or lime and soda ash. It can also be used in conjunction with alum to improve coagulation.

Sodium aluminate is a manufactured product obtained by combining aluminum oxide (Al_2O_3) with sufficient excess causticity (sodium oxide) for stabilization. Sodium aluminate is produced either as a solid or liquid. The solid form is a white or brown granular material containing 60–80 percent $Na_2Al_2O_4$ (19.75–26.33 percent aluminum). The density of solid sodium aluminate is 800 kg/m^3 (50 lb/ft^3). Liquid sodium aluminate is a concentrated solution containing approximately 30–45 percent $Na_2Al_2O_4$ (9.87–14.80 percent aluminum). The specific gravity of liquid sodium aluminate is 1.45–1.60.

Refer to safety data sheets (SDSs) available from the supplier or manufacturer for safety information.

I.B. *History.* Prior to May 15, 1960, a tentative standard for sodium aluminate was designated AWWA B405-59T. On May 15, 1960, the first edition was approved. Subsequent revisions to ANSI/AWWA B405 were prepared by the AWWA Standards Committee on Iron Salts, Aluminum Salts, and Related Coagulant Aids and approved by the AWWA Board of Directors in 1983, 1989, 1994, and 2000. The sixth edition was approved by the AWWA Board of Directors on June 11, 2006. This edition was approved by the AWWA Board of Directors on June 19, 2016.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the Water Research Foundation† (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.
† Water Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including two standards developed under the direction of NSF†: NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 60. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI 60 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA B405 addresses additives requirements in Sec. 4.3.2 of the standard. The transfer of contaminants from chemicals to processed water or to the residual solids is becoming a problem of greater concern. The language in Sec. 4.3.2 is a recommendation only for direct additives used in the treatment of potable water to be certified by an accredited certification organization in accordance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects (http://www.nsf.org/newsroom_pdf/NSF-ANSI_60_watemarked.pdf). However, users of the standard may opt to make this certification a requirement for the product. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

* Persons outside the United States should contact the appropriate authority having jurisdiction.
† NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

II. Special Issues.

II.A. *Advisory Information on Product Application.* Unlike many other flocculant chemicals purchased in liquid form, liquid sodium aluminate is usually purchased by weight of product including water.

This standard provides methods for analyzing insoluble matter, available sodium aluminate, soluble silica, total sodium oxide, and excess sodium oxide. This standard applies to sodium aluminate produced by currently recognized methods of manufacture. If other methods or raw materials are used, impurities could be present that might be inconsistent with good water treatment practices. In such cases, additional tests by the manufacturer may be required to demonstrate that the product is suitable for water treatment purposes.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* When purchasing sodium aluminate under the provisions of this standard, the following information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA B405, Sodium Aluminate, of latest revision.
2. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.
3. Physical form and quantity required (Sec. 4.1).
4. Liquid sodium aluminate may lack stability after storage for more than 30 days. Purchasers may wish to expand on the stability requirements based on individual need (Sec. 4.1.1).
5. Commercial solid sodium aluminate containing additives, such as clay, to improve the feeding or coagulating characteristics or stabilizers to improve shelf life is available. Use of these additional materials requires changing the limitations on insoluble matter (Sec. 4.1.2) and chemical requirements (Sec. 4.2). Together, sodium aluminate and additives (clay and stabilizers) must conform to impurity limitation requirements (Sec. 4.3).
6. In the event that an analysis by a referee laboratory is required, the assignment of testing costs should be addressed (Sec. 5.3).
7. Size and type of container to be used (Sec. 6.2).
8. Affidavit of compliance, certified analysis, or both if required (Sec. 6.3).

9. Whether an analysis by a certified laboratory for the presence of barium, cadmium, chromium, mercury, nitrate, nitrite, selenium, antimony, beryllium, cyanide, nickel, thallium, iron, and manganese is to be required (Sec. 6.3).

10. Details of other federal, state or provincial, and local requirements (Section 4).

11. Whether the purchaser will reject product from containers or packaging with missing or damaged seals. The purchaser may reject product from bulk containers or packages with missing or damaged seals unless the purchaser's tests of representative samples, conducted in accordance with Sec. 5.2, Test Procedures, demonstrate that the product meets the standard. Failure to meet the standard or the absence of, or irregularities in, seals may be sufficient cause to reject a shipment.

12. Whether alternative security measures have been adopted to replace or augment the security measures set out in Sec. 6.2.4 and 6.2.5.

III.B. *Modification to Standard.* Any modification of the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. Major changes made to the standard in this revision include the following:

1. Inclusion of a requirement for compliance with the Safe Drinking Water Act and other federal regulations.

2. A revision of Sec. 5.3, now titled Notice of Nonconformance.

3. Inclusion of a requirement for tamper-evident packaging (Sec. 6.2.4 and 6.2.5).

4. A revision to the Affidavit of Compliance or Certified Analysis (Sec. 6.3).

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

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Sodium Aluminate

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes sodium aluminate ($Na_2Al_2O_4$) in both liquid and solid form for use in the treatment of potable water, wastewater, or reclaimed water. Sodium aluminate according to this standard is a combination of sodium oxide (Na_2O) and aluminum oxide (Al_2O_3) with sufficient excess causticity (sodium oxide) for stabilization.

Sec. 1.2 Purpose

The purpose of this standard is to provide minimum requirements for sodium aluminate, including physical, chemical, sampling, packaging, shipping, and testing requirements.

Sec. 1.3 Application

This standard can be referenced in documents for purchasing and receiving sodium aluminate, and can be used as a guide for testing the physical and chemical properties of sodium aluminate samples. The stipulations of this standard apply when this document has been referenced and then only to sodium aluminate used in the treatment of potable water, wastewater, or reclaimed water.