ANSI/AWWA B601-11
(Revision of ANSI/AWWA B601-05)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Sodium Metabisulfite

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Committee Personnel

The AWWA Standards Committee on Taste and Odor Control Chemicals, which reviewed and approved this standard, had the following personnel at the time of approval.

Thomas E.T. Gillogly, *Chair*

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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 B601.*

I. Introduction.

I.A. *Background.* Sodium metabisulfite, $Na_2S_2O_5$, also known as sodium pyrosulfite or anhydrous bisulfite of soda, is a manufactured product. It is one of several salts known collectively as the sulfur dioxide family. All members of this family have the ability to react with and thereby reduce chlorine and other oxidizing agents. Sodium metabisulfite is a white powder that is readily soluble in water, producing a mildly acidic reaction.

Sodium metabisulfite has been used as a dechlorinating agent for many years in the textile, pulp, and paper industries. Its use in water treatment began in the early 1930s at a plant in Glencoe, Ill., which adopted superchlorination for taste and odor control and higher bacterial destruction. Sodium metabisulfite is usually added to the clearwell to prevent high chlorine residuals in water distributed to consumers. The reaction with chlorine can be represented by the following equation:

$$Na_2S_2O_5 + 2Cl_2 + 3H_2O \rightarrow 2NaHSO_4 + 4HCl \qquad \text{(Eq F.1)}$$

From this equation, the theoretical reducing ability is calculated as 1.34 mg/L of sodium metabisulfite for 1.00 mg/L of chlorine. Commercially available sodium metabisulfite can test greater than 98 percent in strength. Therefore, approximately 1.37 mg/L of sodium metabisulfite is required per 1.00 mg/L of chlorine in actual practice. The reaction is very rapid and complete.

The use of dry (gravimetric) feeders for sodium metabisulfite has become less common. Sodium metabisulfite tends to scavenge oxygen from the air and loses strength if exposed to air for long periods, as is common in dry feeders. Smaller users purchase the solid form and use solutions that are fed with small metering pumps (positive displacement, such as diaphragm pumps). Larger users purchase the bulk solution (analogous to dry solid and liquid alums) and feed directly from storage with metering devices.

Sodium metabisulfite is a high-strength, dry form of sulfur dioxide (SO_2 equivalent of 66 percent). As such, it has application in plants where moderate amounts of dechlorinating agents are involved and where storage and handling of dry material is desired.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

For safety aspects, refer to material safety data sheets (MSDS) available from the chemical supplier or manufacturer.

I.B. *History.* This standard was first approved by the AWWA Board of Directors on Dec. 18, 1953, as ANSI/AWWA B601-53T, Tentative Standard Specifications for Sodium Pyrosulfite. It was advanced to standard on June 17, 1955, and published as ANSI/AWWA B601-55, Standard for Sodium Pyrosulfite. A second revised edition was approved Jan. 27, 1964, and published with the same title.

Additional revisions were approved on May 8, 1977; June 5, 1983; Jan. 25, 1988, and published with the title Standard for Metabisulfite (Sodium Pyrosulfite). On Jan. 31, 1993, another revision was approved and published with the title Standard for Metabisulfite. ANSI/AWWA B601-00 was approved on Jan. 23, 2000. ANSI/AWWA B601-05 was approved on Jan. 16, 2005. This edition was approved on June 12, 2011.

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 American Water Works Association Research Foundation (AwwaRF, now Water Research Foundation*) 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.

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 jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

* Water Research Foundation, 6666 W. Quincy Avenue, Denver, CO 80235

† Persons outside the United States should contact the appropriate authority having jurisdiction.

‡ NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48105.

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 B601 addresses additives requirements in Sec. 4.3 of the standard. The transfer of contaminants from chemicals to processed water or to 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. However, users of the standard may opt to make this certification a requirement for the product. Users of this standard should also 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 all parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues. This standard has no applicable information for this section.

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.* The following information should be provided by the purchaser.

1. Standard used—that is, ANSI/AWWA B601, Sodium Metabisulfite, of latest revision.
2. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.
3. Quantity of sodium metabisulfite required.
4. Details of other federal, state or provincial, and local requirements (Section 4).
5. 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. 5.3, 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.

6. Form of shipment—bulk or package, type, and size of container (Sec. 6.2.1).

7. Whether alternative security measures have been adopted to replace or augment the security measures set out in Sec. 6.2.3 and 6.2.4.

8. Affidavit of compliance, certified analysis, or both, if required (Sec. 6.3).

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. Inclusion of a requirement for tamper-evident packaging (Sec. 6.2.3 and 6.2.4).

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 e-mail at standards@awwa.org.

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AWWA Standard

Sodium Metabisulfite

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the use of sodium metabisulfite ($Na_2S_2O_5$) in the treatment of potable water, wastewater, or reclaimed water.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for sodium metabisulfite, 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 metabisulfite and can be used as a guide for testing the physical and chemical properties of sodium metabisulfite samples. The stipulations of this standard apply when this document has been referenced and then only to sodium metabisulfite used in the treatment of potable water, wastewater, or reclaimed water.