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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 31060-2014

Water treatment chemicals - Aluminum sulfate

水处理剂 硫酸铝

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Molecular formula and molecular mass
- 4 Product classification
- 5 Requirements
- 6 Test methods
 - 6.1 General
- 7 Inspection rules
- 8 Marking, labels and packaging

Foreword

GB/T 31060-2014 was issued on 22 December 2014 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and the Standardization Administration of the People's Republic of China, and has been in force since 1 October 2015.

The technical requirements of Class I products in this standard are mandatory, while the technical requirements and other clauses of Class II products are recommended.

This is the official English translation published by openstd. SAC/TC 63/SC 5, the Water Treatment Agent Branch of the National Chemical Standardization Technical Committee, is in charge of the English translation; in case of any doubt about its contents, the Chinese original is authoritative.

This standard is drafted in accordance with GB/T 1.1-2009 Directives for standardization - Part 1: Structure and drafting of standards. It was proposed by the China Petroleum and Chemical Industry Federation and prepared by SAC/TC 63/SC 5.

1 Scope

The product standard for the aluminium sulfate used as a coagulant in water treatment. Aluminium sulfate is the oldest and still the most widely used flocculant in the world: dosed into raw water it hydrolyses and forms flocs that sweep up the suspended solids, colour and organic matter, and it is what allows a conventional waterworks to turn river water into something a filter can finish. Because the same chemical is dosed directly into drinking water and into industrial and waste streams, the purity that is acceptable depends entirely

on where it ends up, and that is the point of the document: it splits the product into a Class I grade for drinking water and a Class II grade for industrial water, waste water and sewage, and it makes the technical requirements for Class I mandatory while the requirements and other clauses for Class II are recommended. For each class, in solid and in liquid form, it fixes the minimum alumina content that determines the dosing rate, the maximum iron and water-insoluble residue, a minimum pH, and - the part that matters most for potable use - ceilings on arsenic, lead, cadmium, mercury and chromium, since a coagulant dosed continuously into drinking water must not itself become a source of heavy metals. It also requires that the sulfuric acid used to make drinking-water grade product be industrial synthetic acid and the aluminium raw material be industrial aluminium hydroxide, which closes the door on contaminated by-product feedstocks. The bulk of the document is the analytical methods for each of those determinations, followed by the inspection rules and the marking, labelling and packaging requirements. It is used by coagulant manufacturers, by waterworks and industrial water treatment plants, and by the laboratories that check incoming batches.

Warning - The strong acids and alkalis used in this standard are corrosive. Avoid inhalation or skin contact during use. Rinse immediately with plenty of water if it splashes on your body, and seek medical care immediately in severe cases.

This standard specifies the requirements, classification, test methods, inspection rules, marking, labels and packaging of aluminum sulfate.

This standard is applicable to aluminum sulfate for water treatment. The product is mainly used for drinking water and industrial water, waste water and sewage treatment. Among them, the sulfuric acid for the production of aluminum sulfate for drinking water should be industrial synthetic sulfuric acid, and the aluminum-containing raw material should be industrial aluminum hydroxide.

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 reference, the latest edition of the referenced document (including any amendments) applies.

GB/T 191 Packaging - Pictorial marking for handling of goods

GB/T 601 Chemical reagent - Preparations of reference titration solutions

GB/T 602 Chemical reagent - Preparations of standard solutions for impurity

GB/T 603 Chemical reagent - Preparations of reagent solutions for use in test methods

GB/T 610-2008 Chemical reagent - General method for the determination of arsenic

GB/T 6678 General principles for sampling chemical products

GB/T 6680 General rules for sampling liquid chemical products

GB/T 6682 Water for analytical laboratory use - Specifications and test methods

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting value

3 Molecular formula and molecular mass

Molecular formula: $\text{Al}_2(\text{SO}_4)_3 \cdot x\text{H}_2\text{O}$

Relative molecular mass [as $\text{Al}_2(\text{SO}_4)_3$]: 342.15 (according to 2011 international relative atomic mass).

4 Product classification

Aluminum sulfate is classified into two categories according to usage:

Class I: for drinking water.

Class II: for industrial water, waste water and sewage.

5 Requirements

5.1 Appearance: Class I solid products are white to light yellow flakes, lumps and powder, liquid products are colorless to light yellow transparent liquids; Class II solid products are light green or light yellow flakes, lumps and powdered, liquid product is light green or light yellow liquid.

5.2 Aluminum sulfate measured according to the corresponding test method shall be conformed to the requirements given in Table 1.

Table 1 sets, for Class I and Class II and separately for solid and liquid products, a minimum mass fraction of alumina and maximum mass fractions of iron, water-insoluble residue, arsenic, lead, cadmium, mercury and chromium, together with a minimum pH of 3.0 for a 1% aqueous solution common to all four columns. The alumina minimum is 15.60% for solid product in both classes, 7.80% for Class I liquid and 6.50% for Class II liquid. Each row of the table names the subclause of Clause 6 that gives the test method to be used.