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

GB/T 534-2024

Replacing GB/T 534-2014

Sulphuric acid for industrial use

工业硫酸

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Foreword

GB/T 534-2024 was issued on 31 December 2024 by the State Administration for Market Regulation and the National Standardization Administration, and has been in force since 1 July 2025. The /T in the designation marks it as a recommended national standard.

This is the official English translation published by openstd. SAC/TC 63 is in charge of the English translation; in case of any doubt about its contents, the Chinese original is authoritative.

The document is drafted in accordance with GB/T 1.1-2020 Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.

This document replaces GB/T 534-2014 Sulphuric acid for industrial use in whole. In addition to a number of editorial changes, the following technical deviations have been made with respect to the 2014 edition: a) revision of the scope; b) addition of the technical requirements of cadmium, chromium and thallium in concentrated sulphuric acid (see Table 1); c) revision of the technical requirements of iron, lead and mercury in concentrated sulphuric acid; d) addition of the technical requirements of mercury, cadmium, chromium and thallium in fuming sulphuric acid (see Table 2); e) revision of the technical requirements of arsenic and lead in fuming sulphuric acid; f) addition of atomic fluorescence spectrometry for mercury determination and deletion of cold atomic absorption spectrophotometry for mercury determination; g) addition of inductively coupled plasma optical emission spectrometry for iron, lead, cadmium, chromium and thallium determination; h) deletion of "Safety precautions".

Attention is drawn to the possibility that some of the content of this document may be the subject of patent rights; the issuing body is not to be held responsible for identifying any or

all such rights.

The document was proposed by the China Petroleum and Chemical Industry Association and prepared by SAC/TC 63, the National Technical Committee on Chemistry of SAC.

The document was issued in 1965 as the first edition, was first revised in 1982, for the second time in 1989, and was third revised in 2002, during which it incorporated the fifteen parts of GB/T 11198-1989 covering the determination of sulphuric acid content and free sulphur trioxide, ash content, iron, arsenic, lead, mercury, transparency and colour. The fourth revision was issued in 2014, and this is the fifth revision.

1 Scope

The Chinese national specification for industrial sulphuric acid, the single largest-tonnage chemical there is and the one whose consumption has long been used as a proxy for a country's industrial output. Almost every branch of heavy industry buys it - fertilizer, ore leaching, refining, titanium dioxide, batteries, water treatment - and it arrives from very different routes: burning pyrite, burning sulphur, cleaning up smelting flue gas, or recovering it from ferrous sulfate, spent alkylation acid and other sulphur-bearing wastes. Those routes carry different impurities, so a buyer needs a common yardstick, and that is what this document is. It splits the product into concentrated sulphuric acid and fuming sulphuric acid (oleum), and grades each into premium, first and qualified grades. For each grade it fixes the acid strength, the ash content, and ceilings on the metals that a contaminated feedstock brings with it - iron, arsenic, lead, mercury, cadmium, chromium and thallium - the last four of which this 2024 revision either added or tightened, reflecting how much closer the attention to heavy metals in industrial feedstocks has become. Roughly two thirds of the document is the analytical procedures behind those figures, and the revision brings the instrumentation up to date by adding atomic fluorescence spectrometry for mercury and inductively coupled plasma optical emission spectrometry for iron, lead, cadmium, chromium and thallium. Beyond the chemistry it covers inspection rules, the precautionary sign and labelling, accompanying documents, packaging, transport and storage. This is the fifth revision of a standard first issued in 1965, and it replaces GB/T 534-2014 in whole.

Warning: If proper precautions are not taken, the product associated with this document can pose hazards during production, transportation, loading and unloading, storage, and usage. This document does not intend to address all safety issues related to this product. It is the user's responsibility to establish appropriate safety and preventive measures and determine the applicability of regulatory limitations before using this document. Some reagents mentioned in this document are toxic or corrosive, and certain operations are hazardous. This document does not cover all potential safety issues. Users shall strictly follow relevant regulations for proper use and are responsible for implementing appropriate safety and health measures.

This document specifies the product classification, requirements, test methods, inspection

rules, sign, labeling and accompanying documents, packaging, transportation, and storage of sulphuric acid for industrial use.

This document is applicable to sulphuric acid for industrial use produced from pyrite, sulphur, smelting flue gas, and other sulphur-containing materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

GB 190 Packing symbol of dangerous 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 Chemical reagent - General method for the determination of arsenic

GB/T 6680 General rules for sampling liquid chemical products

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

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

GB 15258 General rules for preparation of precautionary label for chemicals

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 other sulphur-containing materials: ferrous sulfate, magnesium sulfate, magnesium sulfite, calcium sulfite, hydrogen sulfide, sulphur-containing waste liquor, sulphur-containing gypsum, alkylated waste acid and etc.

4 Product classification

Sulphuric acid for industrial use is classified into two categories: concentrated sulphuric acid and fuming sulphuric acid.

5 Requirements

Concentrated sulphuric acid shall comply with the requirements specified in Table 1, and fuming sulphuric acid shall comply with the requirements specified in Table 2.

Table 1, the technical requirements of concentrated sulphuric acid, gives for the premium, first and qualified grades a minimum sulphuric acid content of either 92.5% or 98.0% by mass in all three grades, and maximum mass fractions for ash content, iron, arsenic, lead, mercury, cadmium, chromium and thallium that tighten grade by grade: the ash ceiling runs from 0.02% for premium grade to 0.10% for qualified grade, and the arsenic ceiling from 0.0001% to 0.01%.

Table 2 gives the corresponding technical requirements for fuming sulphuric acid.