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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 14420-2024

Replacing GB/T 14420-2014

Analysis of water used in boiler and cooling system - Determination of chemical oxygen demand - Rapid method with potassium dichromate

锅炉用水和冷却水分析方法 化学耗氧量的测定 重铬酸钾快速法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. This document replaces GB/T 14420-2014 "Analysis of boiler water and cooling water - Determination of chemical oxygen demand - Potassium dichromate rapid Compared with GB/T 14420-2014, in addition to structural adjustments and editorial changes, the main technical changes are as follows: Changed the scope (see Chapter 1, Chapter 1 of the.2014 edition); - Changed the volumetric method (see 5.1, Chapter 4 of the.2014 edition); - Added potentiometric titration (see 5.2); - Changed spectrophotometry (see Chapter 6, Chapter 5 of the.2014 edition); - Rapid spectrophotometry has been added (see Chapter 7); - Added safety and environmental protection requirements (see Chapter 8); - The treatment methods for mercury-containing waste liquids (see Appendix A of the.2014 edition) have been deleted. - Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Petroleum and Chemical Industry Federation. This document is under the jurisdiction of the National Technical Committee on Chemical Standardization (SAC/TC 63). This document was drafted by: Chengdu Huijin Water Development Co., Ltd., Guangzhou Special Pressure Equipment Testing Institute, Longbai Group Co., Ltd. Company, Ningxia Ruitai Technology Co., Ltd., Zhejiang Jialing Environmental Protection Technology Co., Ltd., Shandong Taihe Technology Co., Ltd., Nanjing Industrial University of Science and Technology, Zhejiang Luheng Environmental Technology Co., Ltd., CNOOC Tianjin Chemical Research and Design Institute Co., Ltd., Guangdong Special Equipment Testing Research Institute Huizhou Testing Institute of the Institute, Angang Kurita (Anshan) Water Treatment Co., Ltd., Shanghai Yidian Scientific Instrument Co., Ltd., Jiangsu Special Equipment Safety Supervision and Inspection Institute, CNOOC Huizhou Petrochemical Co., Ltd., Jiangsu Ecological Environment

Monitoring and Control Co., Ltd., Swiss Metrohm China Co., Ltd. Co., Ltd., Nanjing Xinkate Biotechnology Development Co., Ltd., and Jiangsu Shengaohua Environmental Protection Technology Co., Ltd. The main drafters of this document are. Cai Bingxian, Li Maodong, Sun Liang, Fan Changchun, Shen Ping, Yao Ya, Chen Guosong, Wu Dan, Wang Yan, Liu Fu, Wang Youbin, Xu Baigong, Wang Jiawen, Liu Baomin, Wu Shaohua, Liu Binhua, Shi Chengcheng, Wei Yongjun, Huang Rong, Du Yuhui, Chen Xiaoli, Wu Shengping. This document was first issued in.1993, revised for the first time in.2014, and this is the second revision. Boiler water and cooling water analysis methods Determination of chemical oxygen demand - Potassium dichromate rapid method Warning. The reagent mercuric sulfate used in this document is a highly toxic chemical. Sulfuric acid is highly corrosive. Please wear the required protective clothing when operating. Wear protective equipment and avoid contact with skin and clothing. If splashed with sulfuric acid, rinse immediately with plenty of water and seek medical attention immediately if serious. Point out all possible safety issues. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national laws and regulations. condition.

1 Scope

GB/T 14420-2024 is the Chinese national standard on analysis of water used in boiler and cooling system - determination of chemical oxygen demand - rapid method with potassium dichromate, in the field of environment and health protection, safety. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 24 July 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2025. Classification: ICS 13.060.50, CCS G 76. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes a rapid method for the determination of chemical oxygen demand in boiler and cooling water using potassium dichromate. The volumetric method in this document is applicable to boiler water and cooling water with a chemical oxygen demand (COD Cr) of 10 mg/L to 1 000 mg/L (measured in oxygen). Spectrophotometry and rapid spectrophotometry are applicable to boiler water and cooling water with chemical oxygen demand (CODCr) of 15 mg/L~ Determination of 1 000 mg/L. This document is also applicable to the determination of chemical oxygen demand (CODCr) in surface water, groundwater, domestic sewage and industrial wastewater.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 6682-2008 Specifications and test methods for water used in analytical laboratories

HG/T 5012 Guidelines for safe pretreatment of laboratory waste chemicals HJ/T 399-2007 Water quality-Determination of chemical oxygen demand-Rapid digestion spectrophotometric method

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 General

Unless otherwise specified, the reagents and water used in this document are analytical grade or above and conform to the three Grade water.

5.1 Indicator method

5.1.1 Principle A known amount of potassium dichromate solution was added to the water sample, and a silver salt was used as a catalyst in a sulfuric acid medium. After boiling and refluxing, a 1,10 x phenanthrene solution was added. The unreduced potassium dichromate in the water sample is titrated with ammonium ferrous sulfate standard titration solution using ferrous sulfate as the indicator. The amount of ammonium is used to calculate the chemical oxygen demand in the water sample. Appropriate amounts of silver nitrate and bismuth nitrate should be added during the determination to eliminate the interference of chloride ions.