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

GB/T 12149-2017

Replacing GB/T 12149-2007

**Determination of silica in water for industrial circulating cooling
system and boiler**

工业循环冷却水和锅炉用水中硅的测定

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 12149-2007 "Determination of industrial circulating cooling water and boiler water silicon, and GB/T 12149-2007 Compared with the main technical changes are as follows:

- Remove the silicate analyzer method (see.2007 edition Chapter 4);
- Increasing the determination of trace silicon spectrophotometry (see 4.3);
- Increasing the determination of trace silicon all hydrofluoric acid conversion spectrophotometry (see 6.3);
- Added test report (see Chapter 7). This standard proposed by the China Petroleum and Chemical Industry Federation. This standard by the National Standardization Technical Committee water treatment chemicals Technical Committee (SAC/TC63/SC5) centralized. This standard is drafted by: Zhejiang Shuizhen Testing Co., Ltd., Henan Qingshuiyuan Technology Co., Ltd., Guangzhou special pressure set Equipment Testing and Research Institute, Ningbo Special Equipment Inspection and Research Institute, Jiangsu Province Special Equipment Safety Supervision and Inspection Institute of Changzhou Branch, CNOOC Tianjin Chemical Research and Design Institute Co., Ltd., Xiamen High-Poole Automation Equipment Co., Ltd., Nanjing University Yixing Environmental Protection Research Institute, Tianjin is up to Technology limited liability company. The main drafters of this standard. Chen Shuang, Liu Yi, Li Hua, Chen Dingyue, Wu Xunzhen, Bai Ying, Li Fang Gong, Chen Jiabin, Ren Hongqiang, Shao Hongqian. This standard replaces the standard version released as.
- GB/T 12149-1989, GB/T 12149-2007;
- GB/T 12150-1989;
- GB/T 14417-1993;

--- GB/T 16633-1996. Industrial circulating cooling water and boilers Determination of silicon in water

1 Scope

GB/T 12149-2017 is the Chinese national standard on determination of silica in water for industrial circulating cooling system and boiler, 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 7 September 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 April 2018. Classification: ICS 13.060.50, CCS G76. 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 standard specifies the method of determination of industrial circulating cooling water, silicon content in boiler water. This standard applies to industrial circulating cooling water, boiler water determination of silicon content. This standard also applies to the determination of silicon in natural water set. The determination of the standard silicon in this standard spectrophotometry for industrial circulating cooling water, boiler water and natural water soluble silicon content of 0.1mg/L ~ 5mg/L determination; spectrophotometric determination of trace silicon for chemical desalinated water, power station boiler feed water, steam, condensate Water and other boilers in the silicon content of 10µg/L ~.200µg/L determination; gravimetric method for industrial circulating cooling water and natural water silicon Determination of the content of more than 5mg/L; Determination of hydrofluoric acid conversion spectrophotometry for the determination of silicon in raw water, furnace water silicon content of 1mg/L ~ 5mg/L determination; hydrofluoric acid conversion spectrophotometric determination of trace silicon for demineralized water, water, water and steam condensate Total silicon content of less than 100µg/L determination.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 602 chemical reagent impurity standard solution preparation

GB/T 6682 analytical laboratory water specifications and test methods

3 Rules

--- The strong acids used in this standard are corrosive, and should be avoided when inhaled or in contact with the skin. Splashed body immediately with large Flush with water, serious illness should seek medical treatment immediately. Reagents and water used in this standard, unless otherwise specified, only the use of analytical reagents and in line with the provisions of GB/T 6682 secondary water. The required standard solution of impurities in the test, did not indicate when the other requirements, according to the provisions of GB/T 602 prepared.

4 Spectrophotometry

4.1 principle At $(27 \pm 5)^\circ \text{C}$, silicate reacts with molybdate to form molybdate yellow (heteropoly-silicate). Silicon molybdenum yellow was 1-amino-2-naphthol-4-sulfonic acid Reduction into silicon molybdenum blue, measured by spectrophotometry.

4.2.1 Reagents or materials

4.2.1.1 hydrochloric acid solution .1 1.

4.2.1.2 oxalic acid solution ($\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$) .100g/L.

4.2.1.3 Ammonium molybdate $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}]$ solution 75 g/L.