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

GB/T 24231-2009

**Chrome ores - Determination of the magnesium, aluminium, silicon,
calcium, titanium, vanadium, chromium, manganese, iron and nickel
contents - Wavelength dispersive X-ray fluorescence spectrometry**

铬矿石 镁、铝、硅、钙、钛、钒、铬、锰、铁和镍含量的测定 波长色散X射线荧光光谱法

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Quarantine;
Standardization Administration of the PRC**

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Foreword

Appendix A, Appendix B and Appendix C of this standard are informative. This standard is proposed by China Iron and Steel Industry Association. This standard is owned by the National Technical Committee on Standardization of Pig Iron and Ferroalloy. The main drafting unit of this standard. Ningbo Inspection and Quarantine Science and Technology Research Institute, Qinhuangdao Entry-Exit Inspection and Quarantine Bureau, Tianjin Entry and Exit Inspection Quarantine Bureau, Metallurgical Industry Information Standards Institute. The main drafters of this standard. Zhang Jianbo, Chen Jianguo, Lin Li, Ying Haisong, Wang Qian, Gu Songhai, Jiang Haitao, Chen Zibin. Chrome ore magnesium, aluminum, silicon, calcium, titanium, vanadium, Determination of chromium, manganese, iron and nickel content Wavelength Dispersive X - ray Fluorescence Spectroscopy

WARNING - Personnel using this standard should have practical experience in formal laboratory work. This standard does not indicate all possible security questions question. It is the user's responsibility to take appropriate safety and health measures and to ensure compliance with the conditions set forth in the relevant national laws and regulations.

1 Scope

China's national method for determining ten elements in chrome ore by wavelength dispersive X-ray fluorescence spectrometry. It specifies the determination of magnesium, aluminium, silicon, calcium, titanium, vanadium, chromium, manganese, iron and nickel in chrome ores. This is the method a laboratory that analyses chrome ore in quantity actually uses, and the reason is arithmetic. The two companion standards determine four elements by emission and one by flame absorption, each requiring a decomposition and each occupying an analyst. This one determines all ten simultaneously from a single prepared disc, in a few minutes, with no wet chemistry after the preparation - which is what makes routine analysis of a shipment or a plant feed possible at all. The preparation is the whole method. X-ray fluorescence is sensitive to the physical form of the sample as well as its composition: particle size, mineralogy and packing all change the measured intensity, which is why a pressed powder gives poor results on a mineral as heterogeneous as chromite. So the sample is fused with a borate flux into a glass disc, which destroys the mineralogy and the particle size effects entirely and presents every element in a homogeneous matrix. The

remaining problem is that the same fusion dilutes the sample and that the elements interfere with one another - chromium, iron, manganese and vanadium are adjacent in the periodic table and their lines and absorption edges overlap. The standard therefore fixes the flux and the fusion ratio, the disc preparation, the analytical lines chosen to minimise overlap, the inter-element corrections, the calibration against certified reference materials of matching type, and the precision for each element. Issued on 15 July 2009 and in force since 1 April 2010.

This standard specifies the determination of magnesium, aluminum, silicon, calcium, titanium, vanadium, chromium, manganese, iron and nickel in chrome ore by wavelength dispersion X-ray fluorescence spectrometry content. This standard applies to chrome ore, chromite in the determination of the above elements, the determination of the elements (in terms of oxide) in Table 1. Table

1 Measurement range of each element Component determination range (mass fraction) /%

Al₂O₃

0.17 to

1.30 Cr₂O₃

55.5 Fe₂O₃ 13.6 ~

0.1 to

0.4 NiO

0.05 to

0.24 SiO₂

0.61 to

14.64 TiO₂

0.1 to

0.56 V₂O₅

0.03 to 0.47

2 normative reference documents

The terms of the following documents are hereby incorporated by reference into this standard. Whichever is the date of the reference file, which is followed by all (Excluding corrigenda) or revisions do not apply to this standard, however, encourage the parties to reach an agreement under this standard Whether you can use the latest version of these files. For undated references, the latest edition applies to this standard.

GB/T 6379.2 Accuracy of measurement methods and results (accuracy and precision) - Part 2. Determination of standard measurement methods The basic method of sex and reproducibility (GB/T 6379.2-2004, ISO 5725-2..1994, IDT)

GB/T 6682 Analytical laboratory water specifications and test methods (GB/T 6682-2008, ISO 3696. 1987, MOD) Metallurgical products - Methods of analysis - General principles of X - ray fluorescence spectroscopy

GB/T 24243 Chromium ore samples (GB/T 24243-2009, ISO 6153. 1989, IDT)

ISO 6154 Preparation of chrome ore samples

The powder sample is melted with a suitable flux to remove the mineral effect and particle effect of the sample and cast into a suitable X-ray fluorescence spectrum Measuring the shape of the glass. Measure the fluorescence X-ray intensity of the characteristic lines of the element to be measured in the glass sheet, according to the calibration curve or equation Analysis, and the inter-element interference effect correction, in order to obtain the content of the elements to be measured.