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

GB/T 38441-2019

**Pig iron and cast iron - Determination of chromium, copper,
magnesium, manganese, molybdenum, nickel and phosphorus**

生铁及铸铁 铬、铜、镁、锰、钼、镍、磷、锡、钛、钒和硅的测定 电感耦合等
离子体原子发射光谱法

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed and managed by the National Foundry Standardization Technical Committee (SAC/TC54). This standard was drafted. Ningxia Sharing Group Co., Ltd., Hebei Longfengshan Casting Co., Ltd., Shandong Jinbaoyuan Copper Co., Ltd. Company, Yantai Product Quality Supervision and Inspection Institute, Shandong Longji Machinery Co., Ltd., Anhui Shenjian Technology Co., Ltd., CITIC Dicastal Company, Maanshan Customs of the People's Republic of China. The main drafters of this standard. Luo Kun, Chen Rong, Zhang Fuwang, Xue Ruili, Bai Jiaxin, Zhao Ruhai, Cui Lanfang, Yang Laicun, Zhang Shipeng, Wang Wei, Zhang Lei, Zhang Bing, Xu Xiliang, Sun Xianguo, Zhang Yi, Chi Xiaohong. Pig iron and cast iron chromium, copper, magnesium, manganese, molybdenum, nickel, phosphorus, Determination of tin, titanium, vanadium and silicon. Inductively coupled plasma Atomic Emission Spectroscopy

1 Scope

China's national method for determining chromium, copper, magnesium, manganese, molybdenum, nickel and phosphorus in pig iron and cast iron. Seven elements in one method, and the selection is not arbitrary: each of them changes what the iron becomes as it solidifies. Magnesium is the one that defines the product - a few hundredths of a per cent converts flake graphite into the spheroidal form that makes ductile iron, and slightly too little leaves it partly flake and structurally worthless. Manganese and copper promote pearlite and therefore strength; nickel and molybdenum do the same more strongly and are added for heavy sections; chromium forms carbides and hardens but embrittles; phosphorus forms a brittle eutectic that improves fluidity and reduces toughness. A foundry has minutes between tapping the furnace and pouring the mould to confirm all seven, which is why a single method covering them together is what the industry actually needs.

This standard specifies the use of inductively coupled plasma atomic emission spectrometry to determine chromium, copper, magnesium, manganese, molybdenum, nickel, phosphorus, Methods of tin, titanium, vanadium and silicon. This standard applies to the determination of chromium, copper, magnesium, manganese, molybdenum, nickel, phosphorus, tin, titanium, vanadium and silicon in pig iron and cast iron.

1.0 Phosphorus 0.004 ~

0.5 Tin 0.004 ~

0.5 Titanium 0.004 ~

0.5 Vanadium 0.004 ~ 0.5

2 Normative references

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

GB/T 6379.2 Accuracy of measurement methods and results (correctness and precision). Part 2. Determination of standard measurement method duplication Basic approach to reproducibility and reproducibility

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 12806 Laboratory glass instrument single marking volumetric flask

GB/T 12807 Laboratory glass instrument graduated pipette

GB/T 12808 Laboratory glass instrument single marking pipette

GB/T 20066 Sampling and sample preparation methods for determination of chemical composition of steel and iron

3 Determination of chromium, copper, magnesium, manganese, molybdenum, nickel, phosphorus, tin, titanium, and vanadium

3.1 Measurement range The measurement element content range is shown in Table 1.
Table

1 Determination of element content range Analysis element content range (mass fraction)
/% Chromium 0.004 ~