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**Ferronickel - Determination of arsenic, tin, antimony, lead and
bismuth contents - Inductively coupled plasma mass
spectrometry**

镍铁 砷、锡、锑、铅和铋含量 电感耦合等离子体质谱法 (ICP-MS)

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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: 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 Iron and Steel Association: This document is under the jurisdiction of the National Technical Committee for Standardization of Pig Iron and Ferroalloys (SAC/TC318): This document was drafted by: Shanxi Taigang Stainless Steel Co., Ltd., Guangdong Brunp Recycling Technology Co., Ltd., Qingdao Bozheng Inspection Technology Co., Ltd., Guangdong Zhongnan Iron and Steel Co., Ltd., Inner Mongolia Xintai Industrial Group Co., Ltd., Shijiazhuang Chuangpu Technology Co., Ltd., Qingdao Dehong Jinxin Technology Co., Ltd., Jitie Ferroalloy Co., Ltd., Hebei Jinxi International Trade Co., Ltd., Metallurgical Industry Information Standard Research Institute Research Institute: The main drafters of this document are: Zhang Ruilin, Wang Jun, Guo Yanqing, Zhao Yanbing, Yang Julei, Liu Xinmei, Cao Jixiang, Tang Honghui, Liu Aikun, Zhang Jiansheng, Ren Yongxiu, Zhong Shoujun, Zhang Zengkun, Liang Yukeng, Xing Wenqing, Zhou Ruidong, Fan Yu, Liu Jinfeng, Liu Bing, Ye Xiaoshuang, and Liu Yanting: Nickel, iron, arsenic, tin, antimony, lead and bismuth content Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Warning

---People who use this document should have practical experience in formal laboratory work: This document does not address all possible safety issues: The user is responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated in relevant national laws and regulations:

1 Scope

China's national method for determining arsenic, tin, antimony, lead and bismuth in ferronickel by inductively coupled plasma mass spectrometry. Ferronickel is the form in which most nickel enters stainless steel, produced by smelting laterite ore, and the five elements in this method are the ones that matter as tramp impurities. They share a characteristic: they have low melting points, they segregate to grain boundaries during

solidification and hot working, and in small quantities they cause hot shortness - the steel cracks when it is rolled or forged rather than deforming. Bismuth and lead are the worst offenders and are damaging at a few parts per million. Since laterite ores vary and the smelting does not remove these elements, the ferronickel has to be analysed, and the concentrations involved are low enough to require mass spectrometry rather than the optical emission methods used for the major constituents.

This document describes the analytical method for the content of arsenic, tin, antimony, lead and bismuth in ferronickel by inductively coupled plasma mass spectrometry: This document is applicable to the determination of arsenic, tin, antimony, lead and bismuth in nickel iron: The determination range of each element is shown in Table 1: Table

1 Elements and measurement range Element determination range (mass fraction)/% As 0:0005~0:

01 Sn 0:0002~0:009 Sb 0:0002~0:

01 Pb 0:0001~0:008 Bi 0:00004~0:0035

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 to This document: GB/T 6379:

1 Accuracy (trueness and precision) of measurement methods and results Part 1: General principles and definitions GB/T 6379:

2 Accuracy (trueness and precision) of measurement methods and results Part 2: Determination of repeatability of standard measurement methods Basic methods of sex and reproducibility

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

GB/T 8170 Rules for rounding off values and expression and determination of limit values

GB/T 12806 Laboratory glassware single-line volumetric flasks

GB/T 12808 Laboratory glassware single-line pipettes

GB/T 25050 Sampling for analysis of the composition of ferronickel ingots or blocks

GB/T 25051 Sampling for analysis of nickel-iron particles

3 Terms and definitions

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

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