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Methods for chemical analysis of zinc concentrates - Part 10: Determination of tin content - Hydride generation - Atomic fluorescence spectrometry

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Foreword

GB/T 8151 *Methods for chemical analysis of zinc concentrates* consists of 20 parts as follows:

— Part 1: Determination of zinc content — Precipitate separation - Na2 EDTA titrimetric method and extractive separation - Na2 EDTA titrimetric method;

— Part 2: Determination of sulfur content — The combustion neutralization titrimetric method;

— Part 3: Determination of iron content — Na2 EDTA titrimetric method;

— Part 4: Determination of silicon dioxide content — Molybdenum blue spectrophotometry;

— Part 5: Determination of lead content — The flame atomic absorption spectrometric method;

— Part 6: Determination of copper content — The flame atomic absorption spectrometric method;

— Part 7: Determination of arsenic content — Hydride generation-atomic fluorescence spectrometry and the potassium bromate titrimetric method;

— Part 8: Determination of cadmium content — The flame atomic absorption spectrometric method;

— Part 9: Determination of fluorine content — The ion selective electrode method;

— Part 10: Determination of tin content — Hydride generation - atomic fluorescence spectrometry;

— Part 11: Determination of antimony content — Hydride generation-atomic fluorescence spectrometry;

— Part 12: Determination of sliver content — The flame atomic absorption spectrometric method;

— Part 13: Determination of germanium content — Hydride generation - atomic fluorescence spectrometry and the phenyl fluorone spectrophotometric method;

— Part 14: Determination of nickel content — The flame atomic absorption spectrometric method;

— Part 15: Determination of mercury content — Atomic fluorescence spectrometry method;

Methods for chemical analysis of zinc concentrates - Part 10: Determination of tin content - Hydride generation - Atomic fluorescence spectrometry

1 Scope

This Part of GB/T 8151 stipulates the methods for determination of tin content in zinc concentrates.

This Part is applicable to the determination of tin content in zinc concentrates. Determination range is 0.0030%~0.50%.

2 Abstract of method

Fuse and decompose the specimen with sodium carbonate and sodium peroxide. In 2% hydrochloric acid medium, and in hydride generator, tin is reduced to hydride by potassium borohydride. Use argon to induce into quartz furnace atomizer. Measure the fluorescence intensity on AFS (atomic fluorescence spectrometer).

3 Reagents

Unless otherwise stated, use only the reagent confirmed as AR, and distilled water or deionized water or water with certain purity.

3.1 Anhydrous sodium carbonate.

3.2 Sodium peroxide.

3.3 Sulfuric acid (ρ1.84g/mL).

3.4 Hydrochloric acid (ρ1.19g/mL).

3.5 Hydrochloric acid (1+1).

3.6 Hydrochloric acid (1+49).

3.7 Sulfuric acid (1+9).

3.8 Potassium hydroxide solution (5g/L).

3.9 Potassium borohydride solution (20g/L): measure 10g of potassium borohydride and dissolve it in 500mL of potassium hydroxide solution (3.8). Prepare it on the day when it

Obtain 2 independent values of determination results under reproducibility conditions. The absolute difference between these 2 results shall not be over reproducibility limit (R). The situation that the absolute difference over reproducibility limit (R) shall not be more than 5%. Reproducibility limit (R) is calculated by linear interpolation method according to Table 3.

Table 3 Reproducibility limit

w_{Sn}/%	0.0015	0.019	0.065	0.26	0.53
R /%	0.0010	0.006	0.013	0.06	0.08

9 Test report

This chapter stipulates the content contained in test report. Test report shall at least include the following information:

— Sample;

— The serial No. of this Part: GB/T 8151.10-2012;

— Analysis result and its expression;

— The differences compared with basic analysis procedure;

— Abnormalities observed in test;

— Test date.

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