PROCEDURE IN THE ANALYSIS OF IRON (Fe)

Document History

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PROCEDURE IN THE ANALYSIS OF IRON (Fe)

1.0 PURPOSE

This procedure details on the complete analysis of Iron (Fe) in mineral ores, soil and other solid samples.

2.0 SCOPE

This procedure is pertinent to solid samples i.e, mineral ores, soil and other solid samples.

3.0 ASSOCIATED DOCUMENTS

3.1 Procedure in Receiving Sample/s
3.2 Procedure in Sampling Method
3.3 Procedure in Preparation of Indicator, Reagent and Standard
3.4 Work Instruction Manual
3.5 Manual on Standard Analytical Procedures of the Mines and GeoSciences Bureau Laboratory (Revised Edition; Diliman Quezon City; 2001

4.0 DEFINITION OF TERMS

4.1 ***Iron (Fe)*** - a malleable ductile silvery-white ferromagnetic metallic element occurring principally in haematite and magnetite. It is widely used for structural and engineering purposes. Iron (Fe) has the following Physical Properties :

- Atomic Number = 26
- Atomic Weight = 55.847
- Valence = 2,3,4, or 6
- Relative Density = 7.874
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- Melting Point = 1,538°C
- Boiling Point = 2,862°C

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4.2 ***Analysis*** - a detailed examination of complex material in order to identify its nature or to determine its elemental composition.Titration - Titration, also known as titrimetry, is a common laboratory method of quantitative chemical analysis that is used to determine the unknown concentration of an identified analyte.

4.3 ***Titrant or titrator*** - is prepared as a standard solution of known concentration and volume of titrant reacts with a solution of analyte to determine concentration of the unknown composition of the sample.

4.4 ***Volume*** – measurement of amount of liquid. Usually expressed in milliliter and liter.

4.5 ***Titer -*** A titer is a way of expressing concentration. Titer testing employs serial dilution to obtain approximate quantitative information from an analytical procedure that inherently only evaluates as positive or negative. The titer corresponds to the highest dilution factor that still yields a positive reading.

5.0 RESPONSIBILITIES

5.1 ***Laboratory Technician I/Laboratory Aide***

5.1.1 Receives sample/s
5.1.2 Prepares sample/s for analysis/ses
5.1.3 Releases Report of Analysis

5.2 ***Chemist III***

5.2.1 Receives sample/s
5.2.2 Analyzes sample/s
5.2.3 Computes result/s of analysis/ses
5.2.4 Releases Report of Analysis

5.3 ***Chemist IV***

5.3.1 Receives sample/s
5.3.2 Assigns sample/s for preparation for analysis
5.3.3 Analyzes sample/s
5.3.4 Computes result/s
5.3.5 Signs Final Report/s of Analysis/ses
5.3.6 Releases Report of Analysis

5.4 ***Mining Claims Examiner II***

5.4.1 Receives sample/s
5.4.2 Records essential details of Incoming Sample/s on a Logbook

5.4.3 Analyzes sample/s
5.4.4 Encodes Report/s of Analysis/ses
5.4.6 Releases Report of Analysis

5.5 ***Division Chief***
5.5.1 Affixes sign on Report of Analysis from the Laboratory

6. 0 PROCEDURE

6.1 Procedure on Sampling Method (Code No.: MGB-CAR-QSP-GSD-ALSS-006)

6.2 Chemist IV/Chemist III/Mining Examiner II
6.2.1 Weighs out 0.2gram powdered sample;
6.2.2 Transfer sample in a 250-ml beaker, cover with watch glass;
6.2.3 Moisten sample with water;
6.2.4 Add 10 ml concentrated Hydrochloric Acid (HCl). Evaporate to dryness. Cool;
6.2.5 Add 10 ml concentrated Hydrochloric Acid (HCl). Digest to smaller volume. Cool;
6.2.6 Add distilled water up to 100 ml mark. Boil. To avoid spattering, place a stirring rod;
6.2.7 Reduce with Stannous Chloride (SnCl2) solution, drop by drop until solution changes to silky white color. Cool;
6.2.8 Titrate the reduced Iron as follows:
6.2.8.1 Add 10 ml Mercuric Chloride (HgCl2) and 20 ml Titrating Solution, solution will turn silky white;
6.2.8.2 Titrate with standard Potassium Dichromate (K2Cr2O7) using Diphenylamine indicator until the endpoint is reached as the solution turns violet;
6.2.9 Computation:

$$\% \text{ Fe} = \frac{(V \times T)K_2Cr_2O_7}{\text{Weight of sample}}$$

$$\text{where } T = \frac{\text{gm Fe} \times \% \text{ purity}}{\text{Volume in ml } K_2Cr_2O_7}$$

6.3 Chemist IV checks results of analysis and Chemist III prepares report on Test Result Worksheet;

6.4 Mining Examiner II encodes final Report of Analysis;

6.5 Chemist IV affixes signature on the final Report of Analysis;

6.6 Chief Geologist signs the final Report of Analysis;

6.7 Procedure in Barcoding/Releasing of Documents, Communications or Correspondence (Code No.: MGB-CAR-QSP-FAD-DCC-001); and

6.8 Laboratory Personnel release/s Report of Analysis to the Client.

7.0 RECORDS

7.1 Bill of Assessment
7.2 Request for Analysis
7.3 Test Result Worksheet
7.4 Report of Analysis
7.5 Logbook
- 7.5.1 Details of Incoming Samples (Private and Official)
- 7.5.2 Incoming Samples (for Receiving Samples)
- 7.5.3 Instruments/Apparatus Use During Analysis
- 7.5.4 Determination of Sample/s