



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

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Standard for process design of molybdenum plants

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1 General

1.0.1 This standard is formulated to unify the process design standards of molybdenum smelters, achieve advanced technology, reasonable economy, safety and reliability, energy saving and environmental protection.

1.0.3 The process design of the molybdenum smelter shall meet the following requirements.

- 1 When the molybdenum smelter is constructed in phases, a comprehensive planning and design should be done;
 - 2 A smelting process with mature technology and advanced economic indicators should be adopted;
 - 3 Intelligent machinery and instrumentation equipment should be integrated to realize process automatic control and digital management;
 - 4 The product structure should be reasonably determined;
 5. The selected new process should have industrial test data or relevant appraisal report.
- 1.0.4 The facilities for environmental protection, safety, fire protection and occupational health shall be designed, constructed and put into production and use at the same time as the main project.
- 1.0.5 The process design of the molybdenum smelter shall not only comply with this standard, but also comply with the current relevant national standards.

2.1.1 Molybdenum concentrate

Molybdenum-containing concentrate produced from molybdenum ore by flotation process.

2.1.2 Roasted molybdenum concentrate

The product of molybdenum concentrate after oxidation and roasting.

2.1.3 molybdenum ferrous molybdenum

Molybdenum-containing ferroalloy produced by out-of-furnace method.

2.1.4 ammonium molybdate ammonium molybdate

The general term for ammonium molybdate salts such as ammonium dimolybdate, ammonium tetramolybdate and ammonium heptamolybdate.

2.1.5 Ammonium dimolybdate ammonium dimolybdate

The product formed after evaporation and crystallization of ammonium molybdate solution.

2.1.6 ammonium tetramolybdate

Ammonium molybdate solution neutralizes the crystallization product.

2.1.7 ammonium heptamolybdate

High-concentration ammonium molybdate solution cooling crystallized product.

2.1.8 pure molybdenum trioxide pure molybdenum trioxide

Hexavalent molybdenum oxide produced by roasting ammonium molybdate.

2.1.9 Molybdenum powder molybdenum powder

Pure molybdenum trioxide is a metal powder produced by hydrogen reduction.

2.1.10 Cleaning charge

Sintered, off-spec lumps.

2.2 Abbreviations

ADM ammonium dimolybdate (Ammonium dimolybdate)

AQM ammonium tetramolybdate (Ammonium tetramolybdate)

AHM ammonium heptamolybdate

3.1 Raw materials

3.1.1 The quality of molybdenum concentrate should comply with the relevant provisions of the current industry standard "Molybdenum Concentrate" YS/T 235.

3.1.2 The quality of roasted molybdenum concentrate should meet the relevant provisions of the current national standard "Roasted Molybdenum Concentrate" GB/T 24482.

3.1.3 The storage of molybdenum concentrate shall comply with the following regulations.

1 It should be stored in a concentrate storage with a protective structure.

2 Measures for unpacking and sampling of concentrate should be taken; dust prevention and dust collection facilities should be set up; when the composition of concentrate fluctuates greatly, measures of mixing and homogenization should be taken.

3 Molybdenum concentrate warehouses in cold regions should be equipped with antifreeze facilities.

4 The molybdenum concentrate warehouse should be equipped with measuring scales and sample reduction facilities, and the accuracy of the measuring scales should be less than 0.2%.

3.1.4 The storage time of materials shall meet the following requirements.

1. The number of days of storage should be determined according to the characteristics of the material, the convenience of transportation, the distance and the procurement of raw

materials;

2 The storage time of molybdenum concentrate should not be less than 5 days.

3.2.1 The flux should meet the following requirements.

1 Ferrosilicon used for ferromolybdenum smelting should meet the relevant provisions of the current national standard "Ferrosilicon" GB/T 2272.

2 The mass proportion of aluminum particles with a particle size of less than 0.5mm used for ferromolybdenum smelting should not exceed 10%, and the mass proportion of particles with a particle size greater than 3mm should not exceed 10%; the mass proportion of active aluminum particles should not be lower than 96 %.

3 Calcium oxide used for ferromolybdenum smelting should comply with the relevant provisions of the current industry standard "Metallurgical Lime" YB/T 042, and the particle size should be less than 3mm.

4 The steel shavings used in the ferromolybdenum smelting process shall be ordinary carbon steel, the particle size range shall be 2mm~20mm, and the chemical composition shall meet the requirements in Table 3.2.1-1.

5 The grain size of iron scale used in the ferromolybdenum smelting process should be less than 10mm, and the chemical composition should meet the requirements in Table 3.2.1-2; when iron scale is replaced by iron ore powder or iron oxide scale, the chemical composition should comply with Table 3.2.1 -2 provisions.

3.2.2 Chemicals should meet the following requirements.

1 Sodium hydroxide (caustic soda) should comply with the relevant provisions of the current national standard "Sodium Hydroxide for Industrial Use" GB/T 209;

2 Sodium nitrate (saltpeter) should meet the relevant provisions of the current national standard "Industrial Sodium Nitrate" GB/T 4553;

3 Sodium carbonate (soda ash) should comply with the relevant provisions of GB 210.1 of the current national standard "Industrial Sodium Carbonate and Its Test Methods Part 1. Industrial Sodium Carbonate";

4 Nitric acid should meet the relevant provisions of the current national standards "Industrial Nitric Acid Concentrated Nitric Acid" GB/T 337.1 and "Industrial Nitric Acid Dilute Nitric Acid" GB/T 337.2;

5 Liquid ammonia should comply with the relevant provisions of the current national standard "Liquid Anhydrous Ammonia" GB/T 536.

3.2.3 The storage of hazardous chemicals should comply with the relevant provisions of the current national standard "General Rules for the Storage of Dangerous Chemicals