FWS:GFH

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

WASHINGTON

Letter
Circular
LC 124

July 16, 1924

RECOMMENDED SPECIFICATION FOR POWDERED AMMONIA

A request having come to the Bureau of Standards to formulate a specification for the material known in the trade as powdered ammonia, an investigation was made of this material and the following specification was prepared. It is believed that this specification will give material of suitable quality to cover the needs of the consumer and at the same time conform to commercial practice.

TYPE

1. Powdered ammonia shall be of one type only, as hereinafter described.

MATERIAL AND WORKMANSHIP

2. Powdered ammonia shall be made of high-grade materials.

GENERAL REQUIREMENTS

3. The material desired under this specification is a uniform mixture of sodium carbonate and ammonium salts in powdered form, which will yield when dissolved in water not less than 1.2 per cent of NH_3. It should be readily soluble in tepid water, should contain no free caustic alkali or inert fillers, and should be of a white or light gray color. Bidder shall state size and number of pounds to the package.

DETAILED REQUIREMENTS

4. Failure to meet any of the following requirements will be cause for rejection:

A. Ammonia, calculated as NH_3, shall not be less than 1.2 per cent.

B. Total alkalinity, calculated as Na_2O, shall not be less than 45 per cent.

C. Total matter insoluble in water shall not exceed 1 per cent.

D. Free alkali, calculated as NaOH, shall not exceed 0.1 per cent.

E. All constituents shall be calculated on the basis of the original sample.

METHOD OF INSPECTION AND TESTING

5. A. Sampling.- No samples shall be submitted with bids.

(1) When Packed in Cans or Cartons.- One can or carton shall be taken at random from not less than 1 per cent of the vendors' shipping containers, provided such containers contain not less than 50 pounds each. In the case of smaller containers a can or carton shall be taken at random from each lot of containers totaling not to exceed 5,000 pounds. The total sample shall in all cases consist of not less than three cans or cartons taken at random from separate containers. With very large lots where the sample drawn as above will amount to more than 20 pounds the percentage of packages sampled shall be reduced, so that the amount drawn shall not exceed 20 pounds. Wrap the individual cans or cartons tightly in paraffined paper at once and seal by rubbing the edges with a heated iron. The inspector should accurately weigh each wrapped can or carton, record its weight and the date of weighing on the wrapper, place the wrapped cans or cartons in an air-tight container, which should be nearly filled, seal, mark, and send to the laboratory for test. Samples should be kept cool until tested. The seller shall have the option of being represented at the time of sampling, and when he so requests shall be furnished with a duplicate sample.

(2) When in Bulk.- A grab sample of not less than one-half pound shall be taken at random from not less than 1 per cent of the vendors' shipping containers, provided such containers contain not less than 100 pounds each. In case of smaller containers a grab sample of not less than one-half pound shall be taken at random from each lot of containers totaling not to exceed 10,000 pounds. The total sample shall in all cases consist of not less than three grab portions taken at random from separate containers. With very large lots where the sample drawn as above will amount to more than 20 pounds the percentage of packages sampled shall be reduced, so that the amount drawn shall not exceed 20 pounds. The inspector should rapidly mix the sample, place in an air-tight container, which shall be filled, seal, mark, accurately weigh, record its weight and date of weighing on the package, and send to the laboratory for test. Samples should be kept cool until tested. The seller shall have the option of being represented at the time of sampling, and when he so requests shall be furnished with a duplicate sample.

B. Methods of Testing.-

(1) Preparation of Sample.- Rapidly disintegrate and mix the sample, if desired quarter down to about 1 pound, and weigh out all portions for analysis at once. Unused portions of the sample used for analysis shall be preserved in an air-tight container in a cool place.

When a determination shows nonconformity with specification, a duplicate shall be run.

(2) Ammonia.- To a dry 500-cc Kjeldahl distillation flask transfer 5 g of the sample, add about 200 cc water, and distil about 150 cc, collecting the distillate in a receiver containing 20 cc of standard sulphuric acid and about 30 cc of water. Titrate the distillate with standard sodium hydroxide solution, using methyl red as indicator. Calculate the percentage of ammonia as NH_3.

(3) Total Alkalinity.- Dissolve 1 g of the sample in 200 cc of cold water and titrate with standard sulphuric acid, using methyl orange as indicator. Calculate the total alkalinity as Na_2O.

(4) Matter Insoluble in Water.- Digest hot a 5-g sample with 200 cc of water. Filter through a weighed Gooch crucible with suction, transferring the insoluble matter to the crucible. Wash the residue in the crucible with hot water until free from alkaline salts. Dry the crucible and residue at 100 to 105°C for three hours, cool, and weigh total matter insoluble in water.

(5) Free Alkali.- Wash the residue remaining in the distillation flask from the ammonia determination (2) into a 250-cc volumetric flask with water, make up to the mark with water, and mix. Transfer 50 cc of this solution to a beaker, add 100 cc of a 10 per cent solution of barium chloride, stir well, add 5 drops of phenolphthalein indicator and titrate with standard sulphuric acid. Calculate the alkalinity as sodium hydroxide (NaOH).

C. Reagents.-

(1) Standard Sodium Hydroxide Solution.- 0.25 N or about 10 g sodium hydroxide dissolved in water and diluted to 1 liter. Standardized against Bureau of Standards benzoic acid.

(2) Standard Sulphuric Acid.- 0.5 N, or about 25.8 g strong sulphuric acid (specific gravity = 1.84) diluted with water to 1 liter. Standardized against standard sodium hydroxide solution.

PACKING AND MARKING

6. No details.

ÆDDITIONAL INFORMATION

7. Basis of Purchase.- Material will be purchased by net weight.

GENERAL SPECIFICATIONS

8. No details.