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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 424

SPECIFICATION FOR PHOTOGRAPHIC GRADE SODIUM CARBONATE, ANHYDROUS

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 424, *Specification for Photographic Grade Sodium Carbonate, Anhydrous*, was drawn up by Technical Committee ISO/TC 42, *Photography*, the Secretariat of which is held by the American Standards Association, Inc. (ASA).

Work on this question by the Technical Committee began in 1956 and led, in 1959, to the adoption of a Draft ISO Recommendation.

In August 1961, this Draft ISO Recommendation (No. 427) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Belgium	Italy	Sweden
Brazil	Japan	Switzerland
Canada	Netherlands	United Kingdom
Chile	New Zealand	U.S.A.
Germany	Romania	U.S.S.R.

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1965, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 424 March 1965

SPECIFICATION FOR PHOTOGRAPHIC GRADE SODIUM CARBONATE, ANHYDROUS

1. SCOPE

This ISO Recommendation is one of a series to establish criteria of purity of chemicals for processing photographic materials. A " photographic grade " chemical is one which meets purity requirements as described.

This specification states the purity requirements and test methods for photographic grade sodium carbonate, anhydrous (Na_2CO_3).

2. PHYSICAL APPEARANCE

Anhydrous sodium carbonate is in the form of a granular or fine white powder.

3. SUMMARY OF REQUIREMENTS

Assay (as Na_2CO_3) : 98.0 per cent minimum.

Bicarbonate (as $NaHCO_3$) : 0.7 per cent maximum.

Free alkali (as NaOH) : 0.2 per cent maximum.

Halides (as NaCl) : 0.6 per cent maximum.

Heavy metals (as Pb) : 0.001 per cent maximum.

Iron (Fe) : 0.002 per cent maximum.

Reaction to ammoniacal silver nitrate : To pass test.

Appearance of solution : To pass test.

4. ASSAY (as Na_2CO_3)

(98.0 per cent minimum)

Dissolve 2.0 g of the sample, weighed accurately, in 50 ml of distilled water. Add 2 drops of methyl orange indicator and titrate with 1 N hydrochloric acid *.

$$1 \text{ ml } 1 \text{ N HCl} = 0.053 \text{ g } Na_2CO_3$$

* Reagents used in making the tests should be recognized reagent grade chemicals normally used for careful analytical work. In all the directions, the acids and ammonium hydroxide referred to should be of full strength, unless dilution is specified. Dilution is specified in terms of normality, when standardization of the reagent is required. When dilution is indicated as $(1+x)$, it means 1 volume of the reagent or strong solution diluted with x volumes of distilled water.

5. BICARBONATE (as $NaHCO_3$)

(0.7 per cent maximum)

Weigh 2 ± 0.1 g of the sample into a 125 ml conical flask. Add 30 ml of freshly boiled distilled water, stopper the flask and dissolve the sample. Add 25 ml of 1 M barium chloride (neutral to phenolphthalein) and 10 drops of phenolphthalein indicator. Stopper and swirl. (If the solution has a pink colour after the addition of the indicator, proceed immediately as stated in section 6.) If the solution is colourless, titrate with 0.1 N sodium hydroxide. Not more than 1 ml of 0.1 N sodium hydroxide should be required to produce the first appearance of a faint pink colour which persists for 30 seconds.

6. FREE ALKALI (as NaOH)

(0.2 per cent maximum)

If the solution has a pink colour after the addition of the indicator as stated in section 5, titrate with 0.1 N hydrochloric acid. Not more than 1 ml of 0.1 N hydrochloric acid should be required to discharge the pink colour.

7. HALIDES (as NaCl)

(0.6 per cent maximum)

Dissolve 1 ± 0.1 g of the sample in distilled water and dilute to 100 ml. Acidify a 2 ml aliquot with 10 ml of dilute nitric acid (1 + 9), add 1 ml of 10 per cent silver nitrate solution, dilute to 50 ml and mix well. The turbidity should be not greater than that produced by 0.12 mg of sodium chloride treated in the same manner as the aliquot. Use Nessler tubes for comparison.

8. HEAVY METALS (as Pb)

(0.001 per cent maximum)

Prepare a 15 ml heavy metals test control containing 0.05 mg of lead ion and a 15 ml iron test control containing a soluble iron salt equivalent to 0.1 mg of iron (see section 9). Dissolve 5 ± 0.1 g of the sample in 15 ml of distilled water. Treat both test controls and the sample solution in the same manner. Add 10 ml of hydrochloric acid and evaporate to dryness on a steam bath. Take up the residue with 5 ml of dilute hydrochloric acid (1 + 99), followed with 25 ml of distilled water. Dilute to 50 ml with distilled water. To 20 ml aliquots of both the heavy metals test control and the sample solution (save the iron test control and the balance of the sample solution for the iron test in clause 9.2), add 1 drop of p-nitrophenol indicator (0.25 per cent aqueous solution) and then add, dropwise, ammonium hydroxide (1 + 9), until the solution turns yellow. Add dilute hydrochloric acid (1 + 99), dropwise, until the solution becomes colourless, and then add 0.5 ml excess. Add 5 ml of hydrogen sulphide water, dilute to 50 ml with distilled water and mix well. Any colour produced in the sample solution should be not stronger than that produced in the heavy metals test control. Use Nessler tubes for comparison.