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# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION



# ISO RECOMMENDATION

# R 420

## SPECIFICATION FOR PHOTOGRAPHIC GRADE POTASSIUM BROMIDE

1st EDITION

March 1965



For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

# BRIEF HISTORY

The ISO Recommendation R 420, *Specification for Photographic Grade Potassium Bromide*, 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 1958, to the adoption of a Draft ISO Recommendation.

In August 1961, this Draft ISO Recommendation (No. 395) 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 | Germany | Romania |
| Brazil | Italy | Sweden |
| Canada | Japan | Switzerland |
| Chile | Netherlands | United Kingdom |
| France | New Zealand | U.S.A. |
| | | 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 420 March 1965

# SPECIFICATION FOR PHOTOGRAPHIC GRADE POTASSIUM BROMIDE

## 1. SCOPE

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

This specification states the limiting concentrations and the test methods for certain inert or photographically harmful impurities that may be present.

## 2. PHYSICAL APPEARANCE

Potassium bromide (KBr) is in the form of white crystals or crystalline powder.

## 3. SUMMARY OF REQUIREMENTS

*Assay* (as KBr) : 99.0 per cent minimum, 100.3 per cent maximum.

*Chloride* (as KCl) : 0.5 per cent maximum.

*Iodide* (KI) : to pass test.

*Moisture* : 0.3 per cent maximum.

*Alkalinity* (as KOH) : 0.015 per cent maximum.

*Acidity* as (HBr): 0.010 per cent maximum.

*Oxidizing substances*: to pass test.

*Sulphide* (as $K_2S$): 0.0008 per cent maximum.

*Insoluble matter, calcium, magnesium and ammonium hydroxide precipitate*: 0.3 per cent maximum residue.

*Heavy metals* (as Pb): 0.002 per cent maximum.

*Iron* (Fe): 0.002 per cent maximum.

*Appearance of solution*: to pass test.

## 4. ASSAY (as KBr)

*(99.0 per cent minimum, 100.3 per cent maximum)*

Take about 0.4 g of the sample, weigh accurately and dissolve in 50 ml of distilled water. Add exactly 50 ml of 0.1 N silver nitrate *, 2 ml of nitric acid, 15 ml of nitrobenzene or benzyl alcohol (CAUTION: Avoid contact with skin) and, finally, 2 ml of saturated solution of ferric ammonium sulphate. Titrate the excess silver nitrate with 0.1 N ammonium thiocyanate to the first persistent colour change.

$$1 \text{ ml } 0.1 \text{ N } AgNO_3 = 0.0119 \text{ g KBr}$$

NOTE.—The assay limits are based on material as received and are not corrected for potassium chloride content. The presence of potassium chloride will increase the assay value. 1 g of potassium chloride is equivalent to 1.6 g of potassium bromide.

* 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. CHLORIDE (as KCl)

*(0.5 per cent maximum)*

Dissolve 0.5 ± 0.01 g of the sample in 15 ml of dilute nitric acid (1 + 2) in a small conical flask. Add 6 ml of 15 per cent hydrogen peroxide solution (prepared by diluting 1 volume of 30 per cent hydrogen peroxide with 1 volume of distilled water) and digest on a steam bath until the solution is colourless. Wash down the sides of the flask with distilled water, digest for an additional 15 min, cool and dilute to 250 ml with distilled water. Dilute a 10 ml aliquot to 25 ml with distilled water and add 1 ml of nitric acid and 0.5 ml of 10 per cent silver nitrate solution. Any turbidity produced should be not greater than that produced by treating 0.06 mg of sodium chloride in the same manner as the aliquot. Use Nessler tubes for comparison.

NOTE.—The test control and sample solutions should be prepared at the same time and compared 15 min after final mixing.

### 6. IODIDE (KI)

*(to pass test)*

Dissolve 10 ± 0.1 g of the sample in 25 ml of distilled water. Add 1 ml of dilute sulphuric acid (1 + 9), 0.5 ml of a 10 per cent ferric chloride solution and 1 ml of carbon tetrachloride or chloroform. Shake the mixture vigorously. The carbon tetrachloride or chloroform layer should not acquire a violet tint.

### 7. MOISTURE

*(0.3 per cent maximum)*

Place 5 ± 0.1 g of the sample in a low-form glass-stoppered weighing bottle and weigh accurately. Dry at 105 °C for 4 hours, cool in a desiccator and weigh. The loss in mass should be not more than 0.015 g.

### 8. ALKALINITY (as KOH)

*(0.015 per cent maximum)*

Dissolve 4 ± 0.1 g of the sample in 100 ml of freshly boiled distilled water. Add 3 drops of phenolphthalein indicator. If a pink colour is produced, it should be discharged by the addition of not more than 0.1 ml of 0.1 N hydrochloric acid. If no pink colour is produced, proceed as in section 9.

### 9. ACIDITY (as HBr)

*(0.010 per cent maximum)*

If no pink colour was produced in section 8, the addition of not more than 0.05 ml of 0.1 N sodium hydroxide should produce a pink colour.

### 10. OXIDIZING SUBSTANCES

*(to pass test)*

Dissolve 1 g of the sample in 10 ml of distilled water. Add 0.5 g of potassium iodide, 1 ml of dilute sulphuric acid (1 + 9) and 1 ml of carbon tetrachloride or chloroform. Shake the mixture vigorously. The colour of the carbon tetrachloride or chloroform layer should not become stronger than that of 10 ml of distilled water treated in a similar manner. Use Nessler tubes for comparison.