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IS 1909 (1992): Indian Curry Powder [FAD 9: Spices and Condiments]



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REAFFIRMED IS 1909 : 1992
DEC 2003 (Reaffirmed - 2012)

भारतीय मानक

इण्डियन करी पाउडर — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

INDIAN CURRY POWDER — SPECIFICATION

(*First Revision*)

REAFFIRMED

DEC 2003

UDC 664.5 CUR

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1992

Price Group 3

**AMENDMENT NO. 1 DECEMBER 1994
TO
IS 1909 : 1992 INDIAN CURRY POWDER —
SPECIFICATION**

(*First Revision*)

(*Page 1, clause 2*) :

- i) Delete 'IS 1070 : 1977 Water for general laboratory use (*second revision*)'.
- ii) Substitute '13145 : 1993 Method of sampling for spices and condiments (*first revision*)' for the existing reference.
- iii) Add 'IS 13545 : 1992 Specification for *GARAM MASALA*'.

(*Page 1, clause 4*) — Substitute 'IS 13145 : 1993' for 'IS 13145 : 1991'.

(*Page 1, Table 1*) — Substitute the following for the existing:

**Table 1 Requirement for Indian Curry Powder
(*Clause 3.4*)**

Characteristic	Requirement	Method of Test, Ref to		
		Annex of This Indian Standard	Cl No. of IS 1799 : 1985	Annex of IS 13545 : 1992
(2)	(3)	(4)	(5)	(6)
Moisture, percent by mass, <i>Max</i>	10.0	—	9	—
Volatile oil, ml/100 g, <i>Min</i>	0.25	—	15	—
Non-volatile ether extract, percent by mass, <i>Min</i>	10	—	14	—
Total ash (on dry basis), percent by mass, <i>Max</i>	12.0	—	6	—
Acid insoluble ash, percent by mass, <i>Max</i>	1.0	—	8	—

Sl No.	Characteristic	Requirement	Method of Test. Ref to		
			Annex of This Indian Standard	Cl No. of IS 1799 : 1985	Annex IS 13545 :
vi)	Crude fibre, percent by mass, <i>Max</i> (see Note)	15	—	13	—
vii)	Lead (as Pb), mg/kg, <i>Max</i>	7.5	—	—	A
viii)	Cadmium, mg/kg, <i>Max</i>	Nil	A	—	—
ix)	Arsenic (as As), mg/kg, <i>Max</i>	Nil	B	—	—

NOTE — Changing the limit of crude fibre would be considered only after modification : *Prevention of Food Adultration Rules, 1955.*

(Page 2, clause 5) — Delete the words 'and 3.5 ' and 'col 4 of '.

(FAD 9)

Reprography Unit, BIS, New Delhi,

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Spices and Condiments Sectional Committee had been approved by the Food and Agriculture Division Council.

Indian curry powder is a blend of numerous spices with varying formulae to suit different tastes.

Indian curry powders are generally used in cooking to impart taste and flavour to a variety of culinary preparations.

This Indian Standard was first issued in 1961. Since then a broad band of varieties of curry powders are being marketed in the country. Therefore, with a view to enabling monitoring of quality of Indian curry powders as currently traded, it was considered imperative to revise this specification. In this revision additional characteristics for Indian curry powder have been incorporated.

While formulating this standard, the Sectional Committee responsible for the formulation of Indian Standards on spices and condiments, took into consideration the prevailing trade practice. This standard is mainly based on the specifications contained in the *Curry Powder (Grading and Marking) Rules, 1956* framed under the *Agricultural Produce (Grading and Marking) Act, 1937* and in the *Prevention of Food Adulteration Rules, 1955*. This standard is, however, subject to the restriction imposed under the *Prevention of Food Adulteration Rules, wherever applicable*.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INDIAN CURRY POWDER — SPECIFICATION

(First Revision)

1 SCOPE

This Indian Standard prescribes the requirements, method of sampling and tests for Indian curry powder.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard.

IS No.	Title
265 : 1987	Hydrochloric acid (<i>third revision</i>)
1070 : 1977	Water for general laboratory use (<i>second revision</i>)
1797 : 1985	Methods of test for spices and condiments (<i>second revision</i>)
1877 : 1985	Terminology for spices and condiments (<i>second revision</i>)
13145 : 1991	Method of sampling for spices and condiments

3 REQUIREMENTS

3.1 Constituents

3.1.1 In the preparation of Indian curry powder any of the spices and condiments listed in IS 1877 : 1985 may be used. These shall be listed in the descending order of their proportion on the container. Edible starch and edible common salt may be added while preparing the material and declarations to these effect shall be made. The quantities of spices and condiments shall not be less than 85 percent of the total mass.

3.1.2 Edible common salt shall not be more than 5 percent of the total mass.

3.1.3 For export purposes only, the quantities of spices and condiments shall be 70 percent, farinaceous matter 20 percent and salt 10 percent respectively of the total mass of curry powder.

3.2 Description

Indian curry powder shall be prepared by grinding clean, dried and sound spices and condiments. It shall be free from dirt, insects,

and/or rodent matter and moulds when examined with naked eye (corrected, if necessary for abnormal vision) or with such magnification as may be necessary in any particular case. If the magnification exceeds 10 × , this fact shall be stated in the test report. The material shall also be free from added colouring matter and preservatives other than salt.

3.3 Taste and Flavour

Indian curry powder shall have a fresh and characteristic taste and flavour. It shall have no foreign flavour, rancidity and mustiness.

3.4 The Indian curry powder shall also comply with the requirements given in Table 1.

4 SAMPLING

Representative samples of the material shall be drawn according to the procedure described in IS 13145 : 1991.

Table 1 Requirements for Indian Curry Powder
(Clause 3.4)

Sl No.	Characteristic	Requirement	Method of Test, Ref. to	
			Annex of this Standard	Cl No. of IS 1797 : 1985
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, <i>Max</i>	10.0	—	6
ii)	Volatile oil, ml/100 g, <i>Min</i>	0.25	—	15
iii)	Non-volatile ether extract, percent by mass, <i>Min</i>	10	—	14
iv)	Total ash (on dry basis), percent by mass, <i>Max</i>	12.0	—	—
v)	Acid insoluble ash, percent by mass, <i>Max</i>	1.0	—	9
vi)	Crude fibre, percent by mass, <i>Max</i> (see Note)	15.0	—	13
vii)	Lead (as Pb), mg/kg, <i>Max</i>	7.5	—	12
viii)	Cadmium, mg/kg, <i>Max</i>	Nil	A	B
ix)	Arsenic (as As) mg/kg, <i>Max</i>	Nil	A	B

NOTE — The value will change subject to the modifications in the *Prevention of Food Adulteration Rules, 1955*.

5 TESTS

Tests shall be carried out in accordance with 3.4 and 3.5 and by the method referred to in col 4 of Table 1.

6 PACKING

6.1 Indian curry powder shall be packed in sealed, clean and sound suitable food grade containers.

6.1.1 A suitable number of such containers shall be packed in wooden or cardboard cases.

7 MARKING

7.1 The following particulars shall be marked or labelled on each container:

- a) Name of the material and the trade name or brand name, if any;

- b) Name and address of the manufacturer;
- c) Batch or code number;
- d) Net mass in metric unit;
- e) Composition giving the names of spices and condiments used in the preparation of the curry powder;
- f) Direction for use; and
- g) "Best before" date.

7.2 Each case shall also be marked with the particulars (a) to (d) as in 7.1.

7.2.1 If glass container are used, each case shall be marked, in addition with the words "Glass handle with care".

ANNEX A

[Table 1, Sl No. (viii)]

DETERMINATION OF CADMIUM CONTENT

A-1 PRINCIPLE

The sample is digested with nitric acid, sulphuric acid and hydrogen peroxide. All reactive metals are extracted from solution, after adjustment to pH 9, with dithiazone in chloroform. Cadmium is removed by stripping chloroform solution with dilute hydrochloric acid and determined by atomic absorption spectrophotometer at 228.8 nm.

A-2 ATOMIC ABSORPTION SPECTROPHOTOMETER

The apparatus shall be having a hollow-cathode cadmium lamp and 10 cm burner head; wavelength 228.8 nm, range 0.2-0.0 $\mu\text{g/ml}$.

A-2.1 Glassware

All glassware shall be thoroughly washed with 8.0 N nitric acid and rinsed with water. Beakers and watchglasses shall be covered during all operation.

A-3 REAGENTS

A-3.1 Nitric Acid — Low in lead and cadmium.

A-3.2 Hydrochloric Acid — 2 N.

A-3.3 Nitric Acid — 8.0 N.

A-3.4 Sulphuric Acid

A-3.5 Hydrochloric Acid — 0.2 N.

A-3.6 Chloroform

A-3.7 Hydrogen Peroxide — 50 percent (v/v).

A-3.8 Citric Acid, Monohydrate

A-3.9 Ammonium Hydroxide

A-3.10 Thymol Blue Indicator

Titrate 0.1 g thymol blue in agate mortar with 4.3 ml of 0.05 N sodium hydroxide solution. Dilute to 200 ml with water.

A-3.11 Dithizone Solution

A-3.11.1 Concentrated Solution

Take 200 dithizone in 200 ml chloroform.

A-3.11.2 Diluted Solution

Take 1 ml of concentrated solution and dilute in 4 ml chloroform. Prepare fresh solution daily of the required volume.

A-3.12 Standard Cadmium Solution

A-3.12.1 Stock Solution

Dissolve 1.000 g cadmium in 165 ml hydrochloric acid and dilute to 1 000 ml with water.

A-3.12.2 Intermediate Solution

Dilute 10 ml stock solution with 2 N hydrochloric acid to 1 000 ml. Prepare just before use.

A-3.12.3 Working Solution

Dilute 0, 1, 5, 10 ml intermediate solution to 100 ml with 2 N hydrochloric acid.

A-4 PROCEDURE

A-4.1 Weigh 50 g sample into a 1 500-ml beaker, add several boiling chips or beads, carefully add 25 ml nitric acid, cover and warm gently to initiate reaction. Carefully add 25 ml nitric acid again when reaction subsides. Warm again and continue until 100 ml nitric acid has been added. Heat until most nitrous oxide fumes have evolved, controlling excessive frothing by cooling or quenching with water from a wash bottle. Some cellulosic or fatty material, if any, will remain undissolved.

A-4.2 To remove the visible fat, cool the beaker in ice and decant clear aqueous solution on a funnel containing glass wool pad filtering into a 1 000-ml beaker. Wash the 1 500-ml beaker with 100 ml water, heat and swirl vigorously and filter into the 1 000-ml beaker.

A-4.3 Add 20 ml sulphuric acid, 300 ml water and evaporate over flame to charring. When charring becomes extensive, add 1 ml hydrogen peroxide cautiously at a time. Care should be taken while adding hydrogen peroxide. The reaction should subside before adding next portion of the oxidant, which should never be more than 1 ml at a time. Continue addition of hydrogen peroxide till the solution is colourless. Then heat vigorously to remove excess hydrogen peroxide. Cool the digested material to room temperature.

A-4.4 Prepare reagent blank of 100 ml nitric acid, 20 ml sulphuric acid and same amount of water as added to the sample. Cautiously add same amount of hydrogen peroxide as above, and remove all nitric acid from blank. Carry blank through same operations as sample.

A-4.5 Add 2 g citric acid to cooled digest and cautiously dilute to about 25 ml with water.

Add 1 ml thymol blue indicator, adjust the pH to 8.8 by slow addition of ammonium hydroxide while cooling on an ice bath till the colour changes from yellowish green to greenish blue. Transfer the solution quantitatively to a 250-ml separating funnel using water and dilute to about 150 ml.

A-4.6 Cool the solution and extract twice with 5 ml portions of concentrated dithizone solution, shaking 1-2 minutes each time. Continue extraction with 5 ml portions of dilute dithizone solution until last 5 ml portion of dithizone extract shows no change in colour. Combine dithizone extracts in a 125-ml separating funnel, washing with 50 ml water and transfer the solution to another 125-ml separating funnel. Wash with water and then with 5 ml chloroform. Add this solution to the dithizone extracts. Add 50 ml 0.2 N hydrochloric acid to the combined dithizone extracts, shake vigorously for 1 minute and allow the layers to separate. Discard the dithizone layer. Wash the aqueous solution with chloroform and then discard the chloroform washings. Transfer the aqueous solution quantitatively to a 400-ml beaker, add boiling chips and carefully evaporate to dryness. Rinse down the sides of the beaker with 10-20 ml water and again evaporate to dryness.

A-4.7 Set the spectrophotometer to previously established conditions, using air-acetylene oxidizing flame and 228.8 nm resonant wavelength. Dissolve the dried residue in 5 ml 2 N hydrochloric acid and determine the absorption (A) of sample and standard solutions against 2 N hydrochloric acid as blank. Flush the burner with water between the readings. Use scale expansion controls to obtain $10 \times$ expansion, as convenient. Calculate the cadmium content from absorption curve against μg cadmium per millilitre of sample solution.

A-5 CALCULATION

Cadmium content, $= (\mu\text{g Cd/ml}) \times (\text{volume of 2N HCl/sample in g})$
 (as Cd), mg/kg

where

Cd = cadmium, and

HCl = hydrochloric acid.

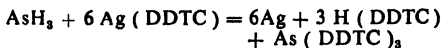
ANNEX B

[Table 1, Sl No. (ix)]

DETERMINATION OF ARSENIC CONTENT

B-1 PRINCIPLE

Absorption of arsenic in a solution of silver diethyldithiocarbamate involves the reaction:



The colloiddally dispersed silver, purplish-red colour, is measured by photometry (nephelometry) at 540 nm.

B-2 APPARATUS

B-2.1 Evolution and Absorption Apparatus

It shall consist of a conical flask *A* of 100 ml capacity for evolution of arsenic, a connecting tube *B* to trap hydrogen sulphide, and absorption tube *C* with a spherical or conical ground glass joint. A spring clip may be used to ensure firm joint between the connecting tube *B* and absorption tube *C* when a spherical joint is used. Suitable forms of apparatus using spherical joint with fritted glass are shown in Fig. 1 and 2.

B-2.2 Spectrophotometer or Photoelectric Absorptiometer

With filters in the range 520 to 560 nm and 10 mm cells.

NOTE — The glassware should not be rinsed with organic solvent to facilitate drying. Traces of organic matter, especially, acetone may be adversely affect the traction between zinc and acid.

B-3 REAGENTS

B-3.1 Concentrated Hydrochloric Acid — see IS 265 : 1987.

B-3.2 Silver Diethyldithiocarbamate Solution

Dissolve 1 g of silver diethyldithiocarbamate in water white pyridine and dilute to 200 ml with pyridine. Store the solution in stoppered-glass bottles away from light.

B-4 PROCEDURE

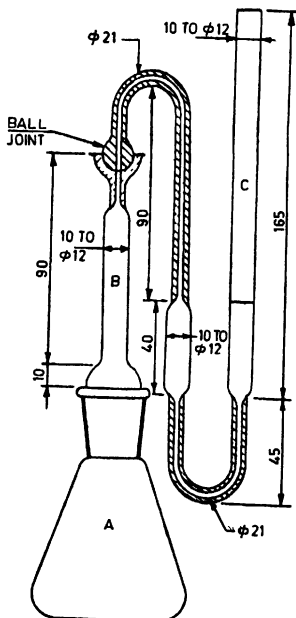
B-4.1 Preparation of Calibration Curve

B-4.2 Evolution of Arsenic

B-4.2.1 Transfer to a series of 100 ml conical flasks, aliquots of standard arsenic solution

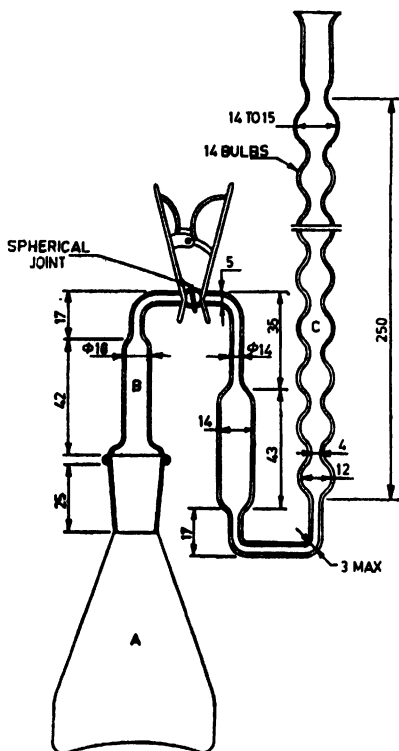
corresponding to 0, 5, 10, 15, 20 and 25 μg of arsenic and proceed as given in **B-4.2.1.1**.

B-4.2.1.1 Add 10 ml of concentrated hydrochloric acid and dilute to 50 ± 5 ml with water. Add 2 ml of potassium iodide and stannous chloride solution respectively. Mix well and let it stand for 15 to 20 minutes. Pack lightly the top third of the connecting tube with impregnated absorbent cotton wool and assemble with the absorption tube. Transfer 5.0 ml of silver diethyldithiocarbamate solution to absorption tube *C*. After 15 to 20 minutes, introduce 5 g of zinc granules into the conical flask *A* and quickly reassemble the apparatus. Allow the reaction to proceed for 45 to 60 minutes at room temperature.



All dimensions in millimetres.

FIG. 1 APPARATUS FOR DETERMINATION OF ARSENIC (SILVER DIETHYLDITHIOCARBAMATE METHOD)



All dimensions in millimetres.

FIG. 2 APPARATUS FOR DETERMINATION OF ARSENIC
(SILVER DIETHYLDITHIOCARBAMATE METHOD)

B-4.2.1.2 Spectrophotometric measurements

Disconnect the absorption tube and tilt the absorber so that the reagent solution flows back and forth between the absorber and bulk to disperse the solid contents, if any, and to mix in the solution well. Transfer the solution to a photometric cell and measure its absorbance at the wave length of maximum absorption, 540 nm, using water as reference liquid.

NOTE — The colour of the dispersion is not very stable for long time and hence absorptiometric (nephelometric) measurement should be made within 2 hours of the development of colour. Care should also be taken to prevent the evaporation of solution as its volume is small.

In the case of fritted glass absorber, raise and lower the connecting tube into the absorber several times to allow the solution to pass through the frit back and forth effecting the dispersal of the red deposit. Let the connecting tube finally drain into the absorber.

10 μg standard shall have an absorption of the order of 0.4.

B-4.2.1.3 Plotting of the calibration curve

Calculate corrected absorbance by subtracting the reading obtained for the solution containing no standard arsenic solution from the observed reading. Plot a graph of corrected absorbance of solution against their arsenic contents.

B-4.3 The test solutions shall be prepared so as to contain 1 to 10 μg of arsenic in a solution of 5.0 ± 0.5 ml volume. Transfer the solution to the conical flask, cool to room temperature if necessary, and proceed as prescribed in 13.2.4.2, 13.2.4.2 (a) and 13.2.4.2 (b).

B-4.4 Blank Test

Carry out a blank test as prescribed in 13.2.4.2, 13.2.4.2 (a) and 13.2.4.2 (b) omitting the sample.

B-5 CALCULATION

Calculate the corrected absorbance by subtracting the value obtained for the blank solution from that obtained for the test solution and read from the calibration curve the corresponding mass of arsenic.

$$\text{Arsenic content, mg/kg} = \frac{M_1}{M_2}$$

where

M_1 = mass in μg of arsenic found, and

M_2 = mass in g of sample in the solution tested.

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