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BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

भारतीय मानक ***मसौदा***

थायोबेनकार्ब, तकनीकी — विशिष्टि

(*आइ एस 12768 का पहला पुनरीक्षण*)

Draft *Indian Standard*

THIOBENCARB, TECHNICAL — SPECIFICATION

(*first revision of IS 12768*)

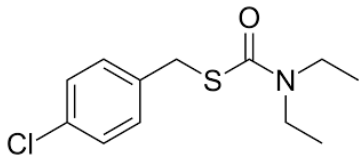
ICS 65.100.20

Pesticides Sectional Committee, FAD 01 **Last date of comments:** 7 December 2024

FOREWORD

(*Formal clauses would be added later*)

Thiobencarb, technical is used in the preparation of herbicidal formulations for agricultural crops. Thiobencarb is the accepted common name by the International Organization for Standardization (ISO) for S-4-chlorobenzyl diethyl (Thiocarbamate). The empirical and structural formulae and the molecular mass of thiobencarb are as indicated below:

Empirical Formula	*Structural Formula*	*Molecular Mass*
$C_{12}H_{16}ClNOS$		257.8

This standard was published in 1989. In this revision, the standard has been brought out in the latest style and format of the Indian Standards, and references to Indian Standards wherever applicable have been updated.

In the preparation of this standard, due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, 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 : 2022 'Rules for rounding off numerical values (*second revision*)'. The

number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for thiobencarb, technical.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
IS 1070 : 1977	Specification for water for general laboratory use (*second revision*)
IS 3903 : 202X	Dimethoate emulsifiable concentrate (EC) – Specification (*third revision*) [*Under preparation Doc: FAD 01(25531)WC*]
IS 6940 : 202X	Pesticides and their formulations – Test methods (*second revision*) [*Under preparation Doc: FAD 01(25870)WC*]
8190 (Part 2) : 1983	Requirements for packing of pesticides: Part 2 Liquid pesticides (*second revision*)
IS 10946 : 1984	Methods of sampling of technical grade pesticides

3 REQUIREMENTS

3.1 Description

The material shall be in the form of clear, slight yellow to amber coloured liquid, free from any extraneous impurities.

3.2 The material shall also comply with the requirements specified in Table 1.

Table 1 Requirements for Thiobencarb, Technical

(*Clauses* 3.2 and 7.1)

SI No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Thiobencarb content. percent by mass, *Min*	93.0	Annex A
ii)	Moisture content, percent by mass, *Max*	0.25	IS 6940
iii)	Material insoluble in acetone, percent by mass, *Max*	0.5	IS 6940
iv)	Acidity (as H_2SO_4) percent by mass, *Max*	0.5	IS 6940

4 PACKING

The material shall be packed in mild steel drums suitably and properly lacquered from inside or HDPE drums of 1.75 to 2.25 mm thickness or HDPE container fitted in mild steel containers. In addition, the material shall comply with the general packing requirements as given in IS 8190 (Part 2).

5 MARKING

The container shall bear legibly and indelibly the following information:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch number;
d) Date of manufacture;
e) Date of expiry;
f) Net quantity;
g) Nominal thiobencarb content, percent (*m*/*m*);
h) Cautionary notice as worded in the *Insecticides Act*, 1968, and Rules framed thereunder; and
j) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material shall be drawn as prescribed in IS 10946.

7 TESTS

7.1 Tests shall be carried out by the appropriate methods referred to in co1 4 of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the Results of analysis.

ANNEX A
[*Table* 1, *SI No*. (i)]
DETERMINATION OF THIOBENCARB CONTENT

A-1 PRINCIPLE

Thiobencarb on hydrolysis with glycolic potassium hydroxide liberates diethylamine which is swept by a stream of nitrogen and absorbed in 2 percent boric acid solution. The decomposed thiobencarb forms potassium salts and remains in the hydrolysis Kettle, which does not interfere in the subsequent titration. The boric acid solution when titrated with standard hydrochloric acid estimates quantitatively liberated amine.

A-2 APPARATUS

An assembly of the apparatus as illustrated in Fig. 1 of IS 3903. Minor modifications in the illustrative assembly with regard to joints may be made. However, it shall be ensured that all joints are leak-proof.

A-3 REAGENTS

A-3.1 Glycolic Potassium Hydroxide Solution — 2 N solution in diethylene glycol.

A-3.2 Boric Acid Solution — 2 percent aqueous solution containing 1 ml of 0.1 percent bromocresol green indicator solution.

A-3.3 Standard Hydrochloric Acid Solution — 0.1 N.

A-4 PROCEDURE

A-4.1 Weigh accurately a quantity of sample containing about 0.4-0.6 g of thiobencarb into the reaction flask or kettle. Add accurately measured 50 ml of 2 N glycolic potassium hydroxide solution to the kettle and assemble the apparatus as shown in the Fig. 1 of IS 3903. Add to the receiver accurately measured 150 ml of 2 percent boric acid solution. Connect the nitrogen inlet tube and start the nitrogen flow so as to get slow and uniform bubbling in the receiver containing boric acid. Apply sufficient heat to the kettle and maintain 225 °C to 250 °C temperature of the reaction kettle so that the boric acid solution changes colour within 5-7 min. Reflux for 90 min. Stop heating while continuing to pass nitrogen for the next 5 min.

A-4.2 Disconnect the receiver first and then the nitrogen supply. Transfer the contents of the receiver into a 500 ml Erlenmeyer flask. Rinse the inside and outside of the gas delivery tube and the inside of the receiver with boric acid solution adding the washing to the Erlenmeyer flask. Titrate the contents of the Erlenmeyer flask with standard hydrochloric acid solution to the original colour of the boric acid solution.

A-5 CALCULATION

Thiobencarb content, percent by mass = $\frac{25.78 \times V \times N}{M}$

where

V = volume, in ml, of standard hydrochloric acid solution used;
N = normality of standard hydrochloric acid solution; and
M = mass, in g, of sample taken for the test.