ETHIOPIAN SATNDARD

ES 6798:2021

First edition
xx-xx-2021

Pesticides — Chlorfenapyr- Specification

ICS: 65.100.01
Published by Ethiopian Standards Agency

Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Pesticides (TC 19) and published by the Ethiopian Standards Agency (ESA).

The standard is developed of the Ethiopian Standard ES 6798: 2021 - *Pesticides – Chlorfenapyr- Specification,* with some editorial changes without altering the technical contents in the former text.

In preparing this Ethiopian Standard reference has been made to the following:

FAO specification and Evaluations Agricultural pesticide - *Chlorfenapyr*- FAO specification 570 / TC (December:2014).

Acknowledgement is made for the use of information from the above publication.

Pesticides— Chlorfenapyr-Specification

1 Scope

This Ethiopian Standard specifies the requirements for chlorfenapyr(for plant protection purpose).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ES 693, *Pesticides - Terminology.*

ES 694, *Pesticides - Methods of sampling.*

ES 695, *Pesticides - Packaging.*

ES 696, *Pesticides - Guidelines on good labelling practice.*

ES 697, *Pesticides - Guidelines for retail distribution, storage and handling.*

ES 700, *Pesticides - Guideline for the disposal of bulk quantities of obsolete pesticides.*

ES 737, *Pesticides - Determination of material insoluble in acetone.*

ES 749, *Pesticides - Determination of water content.*

ES 750, *Pesticides - Determination of free acidity or alkalinity*.

3 Definitions

For the purpose of this Ethiopian Standard terms defined in ES 693 shall apply.

4 General information

ISO common name

Chlorfenapyr (ISO 1750 approved)

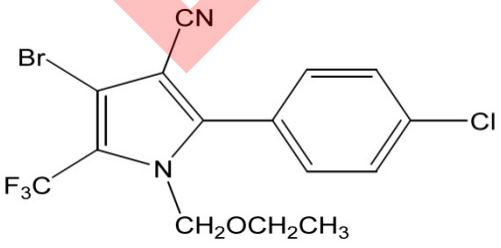
*Synonyms*None

Chemical names

IUPAC 4-bromo-2-(4-chlorophenyl)-1-ethoxymethyl-5-trifluoromethyl-*1H*-pyrrole-3- carbonitrile

CA 4-bromo-2-(4-chlorophenyl)-1-(ethoxymethyl)-5-(trifluoromethyl)-*1H*-pyrrole-3- carbonitrile

Structural formula



Molecular formula

$C_{15}H_{11}BrClF_3N_2O$

Relative molecular mass 407.6

CAS Registry number

122453-73-0

CIPAC number 570

Identity tests

HPLC retention time, IR spectrum

5 Chlorfenapyrtechnical material

5.1 Description

The material shall consist of chlorfenapyr together with related manufacturing impurities and shall be off-white to tan halide-smelling solid, free from visible extraneous matter and added modifying agents.

5.2 Active ingredient

5.2.1 Chlorfenapyr content

The chlorfenapyr content shall be declared (not less than 940 g/kg) and, when determined, the average measured content shall not be lower than the declared minimum content.

Note 1 The method of analysis for identification and determination of chlorfenapyr content in TC and SC, was adopted as CIPAC Method in 2011 and became a full method in 2012.

6 Physicalproperties

6.1 Pourability(MT 148.1, CIPAC Handbook J, p. 133, 2000) Maximum "residue":5%.

6.2 Spontaneity of dispersion (MT 160, CIPAC Handbook F, p. 391, 1995) (Notes 4 &5)

A minimum of 80% of the chlorfenapyr content found under 2.2 shall be in suspension after 5 min in CIPAC Standard Water D at 30 ± 2°C (Note 6).

6.3 Suspensibility (MT 184, CIPAC Handbook K, p. 142, 2003) (Note4)

A minimum of 70% of the chlorfenapyr content found in section 2.2 shall be in suspension after 30 min in CIPAC Standard Water D at 30 ± 2°C.

6.4 Wet sieve test (MT 185, CIPAC Handbook K, p. 149, 2001) (Note 6) Maximum: 2 % of the formulation shall be retained on a 75 µm testsieve.

6.5 Persistent foam (MT 47.3) (Notes 7 & 8) Maximum: 50 ml after 1min.

6.6 Storagestability

Stability at 0°C (MT 39.3, CIPAC Handbook J, p. 128,2000)

After storage at 0 ± 2°C for 7 days, the formulation shall continue to comply with clauses for:

- suspensibility(6.3),
- wet sieve test(6.4)

Stability at elevated temperature (MT 46.3, CIPAC Handbook J, p. 128,2000)

After storage at 54 ± 2°C for 14 days, the determined average active ingredient content must not be lower than 95% relative to the determined average content found before storage (Note 9) and the formulation shall continue to comply with the clauses for:

- pourability(6.1),
- spontaneity of dispersion(6.2),
- suspensibility(6.3),
- wet sieve test(6.4)

Table 1: Physico-chemical properties of pure chlorfenapyr

S/N	Parameters	Typical Value	Test method
1	Appearance	off-white to tan halide-smelling solid	visual
2	Solubility - In water at 20 °C (mg l^{-1})	0.11 mg/l at 20°C, pH=5 0.11 mg/l at 20°C, pH=7 0.14 mg/l at 20°C, pH=9 0.11 mg/l at 10°C, unbuffered deionized water 0.14 mg/l at 20°C, unbuffered deionized water 0.20 mg/l at 30°C, unbuffered deionized water	EEC A6; OECD 105
3	Solubility - In organic solvents at 20 °C (mg l^{-1})	Soluble in most organic solvent	flask method
4	Melting point (°C)	101.4 - 102.3 °C	OECD 105, OPPTS
5	Boiling point (°C)	Decompose before boiling	796.1840, EEC A.6
6	Flashpoint (°C)	No data available	EEC A1; OECD 102;
7	Specific gravity (g ml^{-1})	No data available	differential scanning calorimetry (DSC)
8	Stability	When heated decompose to toxic vapors	OECD 103, OPPTS
9	Henry's law constant at 25 °C (Pa m^3 mol^{-1})	5.81 X 10-04 (Non volatile)	830.7220, EEC A.2

Table 2: Chemical composition and properties of chlorfenapyr technical material

Manufacturing process, maximum limits for impurities ☐1 g/kg, 5 batch analysis data	Confidential information supplied and held on file by FAO. Mass balances were 98.6 – 99.8 % and percentages of unknowns were < 0.1 %.
Declared minimum chlorfenapyr content	940 g/kg
Relevant impurities ☐1 g/kg and maximum limits for them	None

Relevant impurities <1 g/kg and maximum limits for them:	None
Stabilizers or other additives and maximum limits for them:	None
Melting temperature range of the TC	100 - 101□C (98.8%)

7 Handling

Pesticides shall be handled in accordance with ES 697.

8 Sampling

Samples shall be taken in accordance with ES 694.

9 Packaging

Pesticides shall be packed in accordance with ES 695.

10 Labeling

Pesticides labeling shall be in accordance with ES 696.

11 Disposal

Disposal of bulk quantities of obsolete pesticides shall be in accordance with ES 700.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standards and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for Standardization (ARSO).

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