

TECHNICAL DATA BULLETIN

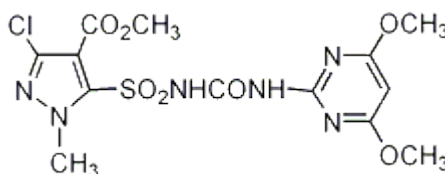
HALOSULFURON-METHYL TECHNICAL

1 INTRODUCTION

Halosulfuron is a systemic herbicide, absorbed by the root system and/or leaf surface, and translocated to meristem tissues. It is ALS inhibitor has demonstrated activity for the control of annual broad-leaved weeds and nutsedge species, in maize, sugar cane, rice, sorghum, nuts and turf. Halosulfuron also available with different combination of herbicide for best control of weeds.

2 ACTIVE INGREDIENT

Common name	:	Halosulfuron
IUPAC name	:	3-chloro-5-(4,6-dimethoxypyrimidin-2-ylcarbamoylsulfamoyl)-1-methylpyrazole-4-carboxylic acid
Chemical Abstracts name	:	3-chloro-5-[[[(4,6-dimethoxy-2-pyrimidinyl) amino]carbonyl]amino]sulfonyl]-1-methyl-1H-pyrazole-4-carboxylic acid
CAS No	:	135397–30–7
Empirical formula	:	C ₁₃ H ₁₅ ClN ₆ O ₇ S
Molecular weight	:	434.8
Structural formula	:	



3 PHYSICOCHEMICAL PROPERTIES

Technical Purity	:	98% w/w Min.
Appearance	:	White powder
Melting Point	:	175.5–177.2 °C
Density	:	1.618 g/ml (25 °C)
Vapour Pressure	:	<0.01 mPa (25 °C)
Partition co-efficient	:	logP = –0.0186
Solubility in water	:	0.015 (pH 5), 1.65 (pH 7) g/l (20 °C).

Solubility in solvents : In methanol 1.62 g/l (20 °C)
 Stability : Stable under normal storage conditions.

4 APPLICATIONS

Biochemistry:

Branched chain amino acid synthesis (ALS or AHAS) inhibitor. Acts by inhibiting biosynthesis of the essential amino acids valine and isoleucine, hence stopping cell division and plant growth. Selectivity derives from rapid metabolism in the crop. Metabolic basis of selectivity in sulfonylureas reviewed (M. K. Koeppe & H. M. Brown, *Agro-Food-Industry*, 1995, **6**, 9–14).

Mode of action:

Systemic herbicide, absorbed by the root system and/or leaf surface, and translocated to meristem tissues.

Uses:

Halosulfuron-methyl has demonstrated activity for the control of annual broad-leaved weeds and nutsedge species, in maize, sugar cane, rice, sorghum, nuts and turf. Efficacy has been observed with post-emergence (18–35 g/ha) applications.\

Phytotoxicity:

Some hybrids or varieties of sweet corn and popcorn may be sensitive.

Formulation types:

WG; WP.

5. TOXICITY

Oral: Acute oral LD₅₀ for rats >2000 mg/kg..

Skin and eye: Acute percutaneous LD₅₀ for rats >2000 mg/kg.

Inhalation: LC₅₀ (4 h) for rats >4.45 mg/l.

NOEL: (104 w) for male rats 108.3, female rats 56.3 mg/kg daily; (18 mo) for male mice 410, female mice 1215 mg/kg daily; (1 y) for male and female dogs 10 mg/kg daily..

ADI: (EPA) aRfD 0.5, cRfD 0.1 mg/kg b.w. [2000].

Toxicity class: WHO (a.i.) U (company classification)

6. ECOTOXICITY

Birds: Acute oral LD₅₀ for bobwhite quail >2250 mg/kg. Dietary LC₅₀ (5 d) for bobwhite quail and mallard ducks >5620 ppm

Fish: LC₅₀ (96 h) for bluegill sunfish >118, rainbow trout >131 mg/l.

Daphnia: EC₅₀ (48 h) >107 mg/l.

Algae: EC₅₀ (5 d) for green algae (*Selenastrum capricornutum*) 0.0053, blue-green algae (*Anabaena flos-aquae*) 0.158 mg/l.

Bees: Toxic to bees. LD₅₀ (dermal) >100 µg/bee

Worms: LC₅₀ >1000 mg/kg soil.

7 ENVIRONMENTAL FATE

Animals:

Rapidly eliminated from rats, in urine and faeces. The major metabolite is desmethyl halosulfuron-methyl. Further demethylation or hydroxylation of the pyrimidine ring yielded several minor mono- and di- hydroxylated metabolites.

Plants:

The major metabolite in maize is 3-chloro-1-methyl-5-sulfamoylpyrazole-4-carboxylic acid (cleavage of urea bridge and ester hydrolysis).

Soil/Environment:

Extensively metabolised in soil. In acidic soils, by hydrolytic cleavage of the sulfonylurea bridge to give aminopyrimidine and 3-chlorosulfonamide ester metabolites, which can undergo further hydrolysis to the acid. In alkaline soils, rearrangement and contraction of the sulfonylurea linkage, and opening of the pyrimidine ring are more important pathways. Under acidic and alkaline laboratory aerobic soil conditions, mineralisation to CO₂ reached 9% and 62%, respy., after one year. DT₅₀ <18 d. Although laboratory adsorption/desorption studies indicated the potential for moderate mobility of halosulfuron-methyl, field studies demonstrated that mobility is limited, probably because of rapid soil dissipation.

8. HANDLING & STORAGE

Handling:

Keep away from food, drink, and animal feedstuff. KEEP OUT OF REACH OF CHILDREN. Wear suitable Personal protective equipment when handling and spraying.

Storage:

Store in the original container in a dry, cool, ventilated, LOCKED area. DO NOT store in prolonged sunlight. DO NOT store with food, seed, or animal feedstuff.

9. DISPOSAL CONSIDERATIONS

Packages or surplus material & washing from the machines & containers should be disposed of in a safe manner so as to prevent environmental water pollution. The used packages shall not be left outside to prevent their re-use. Packages shall be broken & buried away from habitation.