FEATURED PRODUCT

Acetochlor

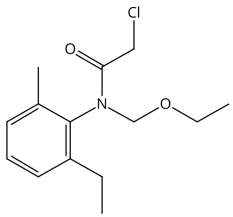
Acetochlor is a monocarboxylic acid amide that acts like an N-phenylacetamide.[1,2] It was developed by Monsanto and Zeneca[3] and first registered in 1994.[5]

Its ability to control weeds by restricting seedling growth makes Acetochlor a commonly used chloroacetanilide herbicide. Acetochlor is usually administered just before or after planting because it needs to be in place prior to weed germination in order to successfully stunt their growth.[6] This herbicide is applied to various crops from cabbage and corn to maize and soybeans[5] as it extends great control over most annual grassy weeds and several annual broadleaf weeds.[6]

Following its application to crops, Acetochlor is metabolised to differing compounds.[8] Acetochlor ethanesulfonic acid (ESA) is one such degradate[9] as well as 2-(1-hydroxyethyl)-6-methylaniline (HEMA), which is developed by metabolites hydroxylated at the 1-position of the ethyl side chain.[8] Other common degradation products reported in the literature are the oxanilic acid (OA) and sulfinylacetic acid (SAA).

Acetochlor

Chiron part: 14795.14
Synonym: Acetochlore; Azetochlor
CAS: 34256-82-1
Molecular Weight: 269.77
Molecular Formula: C14H20ClNO2



What are the concerns?

Acetochlor may be highly effective however it does come with some disadvantages; the chemical is known to cause both skin and respiratory irritation as well as potentially triggering an allergic reaction.[7]

It is harmful if inhaled[7], although it's most likely the average person would be exposed to Acetochlor during the application process or at an acute level via contaminated drinking water due to leaching of herbicide from crop soil. Animal studies indicate Acetochlor ESA is not as potent as its parent compound therefore it appears less toxic to aquatic organisms even though it still attacks aquatic plants and algae to manage their growth.[9]

Acetochlor ESA sodium salt

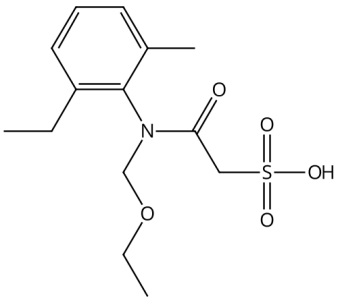
Chiron part: 10623.14

Synonym: Acetochlor-ethane sulfonic acid sodium; ESA

CAS: 947601-84-5

Molecular Weight: 338.38

Molecular Formula: C14H21NO5S.Na



• Na

How is it monitored and regulated?

Acetochlor is included in the United States' Environmental Protection Agency (EPA) Method 535: Detection of Degradates of Chloroacetanilides and other Acetamide Herbicides in Water by LC/MS/MS.[10]

Acetochlor ESA is a structural isomer of the commonly co-analysed Alachlor ESA and thus shares product ions; m/z 80 and 121.[10] Care is needed to consistently resolve these two compounds. Whilst unique and differentiating ions exist, they offer much lower sensitivity.

Additionally, the EPA website hosts several environmental chemistry methods which address analysis of Acetochlor and related compounds in water and soil (see table 1). They are currently in the process of validating the analytical methods for measuring pesticide residues.

Furthermore, Acetochlor is one of the 79 substances covered in the review programme assessed by the European Food Safety Authority (EFSA) for Commission Regulation (EC).[4] The key findings of the report are as follows: the acceptable daily intake (ADI) is 0.0036 mg/kg bw/day; the acceptable operator exposure level (AOEL) is 0.02 mg/kg bw/day and the acute reference dose (ARfD) is 1.5 mg/kg bw.[4]

Analyte(s) by Pesticide	ECM MRID	Matrix	Method Date
Acetochlor	40811902	Soil	08/01/1988
Acetochlor	41592012	Soil	05/01/1989
Acetochlor	41089204	Soil	11/01/1988
Acetochlor & Degradates	42573402	Soil	10/03/1990
Acetochlor Degradates	41592013	Soil	5/24/90
Acetochlor Sulfoxide Degradate	42549918	Soil	3/31/92
Acetochlor (Multi-analyte)	Pesticide Analytical Manual Vol. 2	Water	06/10/1994
Acetochlor (Multi-analyte)	44712301	Water	3/20/96
Acetochlor & Oxanilic Acid Degradate	44632708	Water	02/03/1998
Acetochlor & Sulphonic Acid Degradate	44632709	Water	12/20/96

Table 1. List of EPA environmental Chemistry Methods including Acetochlor

What does Chiron offer?

Available Standards:

Chiron No.	Name	Synonym	CAS
14795.14	Acetochlor	Acetochlore; Azetochlor	34256-82-1
2916.14	Acetochlor-d11 (2-ethyl-6-methylphenyl-d11)	Acetochlore-d11; Azetochlor-d11	1189897-44-6
10623.14	Acetochlor ESA sodium salt	Acetochlor-ethane sulfonic acid sodium; ESA	947601-84-5
15010.9	2-(1-Hydroxyethyl)-6-methylaniline	HEMA	196611-19-5

Chiron offer ready to use 100 µg/mL calibrated solutions for Acetochlor, ESA and HEMA.
For a quotation, please contact us today at **sales@chiron.no**

References

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2. Acetochlor - Compound summary | pubchem.ncbi.nlm.nih.gov/compound/acetochlor | 2023
3. Acetochlor (T3D0811) | www.t3db.ca/toxins/T3D0811| 2014
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5. Acetochlor - ScienceDirect Topics | www.sciencedirect.com/topics/earth-and-planetary-sciences/acetochlor | 2009
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8. Development of an LC–MS/MS-based method for determination of acetochlor and its metabolites in crops | sciencedirect.com | 2022
9. Acetochlor ESA and Drinking Water, Minnesota Department of Health | health.state.mn.us/ | 2017
10. Detection of Degradates of Chloroacetanilides and other-Acetamide Herbicides in Water by LC/MS/MS, SCIEX | sciex.com/ | 2010

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