Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
SULFOSATE
Last Update on January 10, 1994
[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

Common Name:SULFOSATE
Smiles Code:
PC Code # :128501 CAS #:81591-81-3 Caswell #:

Chem. Name :TRIMETHYLSULFONIUM CARBOXYMETHYLAMINOMETHYL-PHOSPHONATE

Action Type:Herbicide

Trade Names:TOUCHDOWN
(Formul'tn):
Physical State:

Use :NONSELECTIVE SYSTEMIC HERBICIDE FOR POSTEMERGENCE WEED
Patterns :CONTROL
(% Usage) :
:

Empirical Form: $C_3H_7NPO_5^- + SC_3H_9$
Molecular Wgt.: 245.23 Vapor Pressure: 4.00E -7 Torr
Melting Point : °C Boiling Point: 110C@1Atm°C
Log Kow : -5 pKa: @ °C
Henry's : E Atm. M3/Mol (Measured)

Solubility in ...					Comments
Water	E	ppm	@20.0	°C	very soluble
Acetone	E	ppm	@	°C	
Acetonitrile	E	ppm	@	°C	
Benzene	E	ppm	@	°C	
Chloroform	E	ppm	@	°C	
Ethanol	E	ppm	@	°C	
Methanol	E	ppm	@	°C	
Toluene	E	ppm	@	°C	
Xylene	E	ppm	@	°C	
	E	ppm	@	°C	
	E	ppm	@	°C	

Hydrolysis (161-1)
[V] pH 5.0:STABLE 25C
[V] pH 7.0:STABLE 25C
[V] pH 9.0:STABLE 25C
[ ] pH :
[ ] pH :
[ ] pH :

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Photolysis (161-2, -3, -4)
[V] Water:pH5 CAT. STABLE; AN. 14.6DA
[V] :pH7 CAT. STABLE; AN. 77.9DA
[V] :pH9 CAT. 31.7DA; AN. 41.6DA
[ ] :

[V] Soil :+ STABLE; ANION 382 HR
[ ] Air :

Aerobic Soil Metabolism (162-1)

	SOIL	pH	%OM	(+)	(-)
[V]	SdLm	5.6	1.1	49 HRS	13HR
[ ]	LOAM	6.9	1.9	300 "	16 "
[ ]	SAND	6.7	2.5	29 "	33 "
[ ]	LOAM	5.7	6.2		19 "
[ ]					
[ ]					

Anaerobic Soil Metabolism (162-2)
[V] T1/2 FOR (+) MOIETY=2 MONTHS
[ ] BASED ON CO2 EVOLUTION
[ ]
[ ]
[ ]
[ ]
[ ]

Anaerobic Aquatic Metabolism (162-3)
[ ]
[ ]
[ ]
[ ]
[ ]
[ ]
[ ]

Aerobic Aquatic Metabolism (162-4)
[ ]
[ ]
[ ]
[ ]
[ ]
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[ ]

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Soil Partition Coefficient (Kd) (163-1)

	Kd VALUES FOR TMS MOIETY:				
[ ]	Sd	Si	Cl	%OM	pH	Kd
[V]	88	9	3	0.6	7.9	6.72
[V]	44	43	13	1.4	6.6	3.67
[V]	14	56	30	4.4	5.3	8.08
[V]			52	2.1	5.1	8.96

Soil Rf Factors (163-1)

[V]		CATION	ANION
[ ]	SdLm	.06	.20
[ ]	Lm	.01	.16
[ ]	Sd	.09	.08
[ ]	Lm	0.0	.16
[ ]			

Laboratory Volatility (163-2)
[ ]
[ ]

Field Volatility (163-3)
[ ]
[ ]

Terrestrial Field Dissipation (164-1)

[V]	FIELD STUDIES CONDUCTED IN VA, CA, IO, FL; APPL 6 LBS AIA:			
[ ]	STATE	CAP(-)	TMS(+)	AMPA (CAP DEGRADATE)
[ ]	VA	<7 DAYS	NON-DETECT.	VARIABLE
[ ]	CA, IO, FL	23-26 DAYS	30-50 DAYS	83-92 DAYS
[ ]				
[ ]				
[ ]				
[ ]				
[ ]				
[ ]				

Aquatic Dissipation (164-2)
[ ]
[ ]
[ ]
[ ]
[ ]
[ ]

Forestry Dissipation (164-3)
[ ]
[ ]

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Long-Term Soil Dissipation (164-5)
[ ]
[ ]

Accumulation in Rotational Crops, Confined (165-1)
[ ]
[ ]

Accumulation in Rotational Crops, Field (165-2)
[ ]
[ ]

Accumulation in Irrigated Crops (165-3)
[ ]
[ ]

Bioaccumulation in Fish (165-4)
[ ]
[ ]

Bioaccumulation in Non-Target Organisms (165-5)
[ ]
[ ]

Ground Water Monitoring, Prospective (166-1)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Small Scale Retrospective (166-2)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Large Scale Retrospective (166-3)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Miscellaneous Data (158.75)
[ ]
[ ]
[ ]

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Field Runoff (167-1)
[ ]
[ ]
[ ]
[ ]

Surface Water Monitoring (167-2)
[ ]
[ ]
[ ]
[ ]

Spray Drift, Droplet Spectrum (201-1)
[ ]
[ ]
[ ]
[ ]

Spray Drift, Field Evaluation (202-1)
[ ]
[ ]
[ ]
[ ]

Degradation Products

Aminomethylphosphonic acid (anion deg. from photolysis)

CO2 is major degradate of TMS moiety in aerobic soil study.

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Comments

Sulfosate consists of an N-(Phosphonomethyl) glycine anion and a trimethylsulfonium cation. The anion degrades to aminomethylphosphonic acid (AMPA) via photolysis (aqueous and soil).
There are discrepancies in the aerobic metabolism data; in addn. to that shown, T1/2 for (+) in loam was 192 days in one study but in another was < 1 month based on CO2 evolution.
T1/2 for (-) on soil was 382 hours, but (+) was stable.
In an anaerobic soil study, in 66 days 43% of radioactive (-) moiety was recovered as CO2.

References: EPA REVIEWS
Writer : PJH