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

Chem. Name: TRIMETHYL SULFONIUM CARBOXYMETHYLAMINOMETHYL-PHOSPHONATE

Action Type: Herbicide

Trade Names: TOUCHDOWN
(Formul'tn):

Physical State:

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

Empirical Form: C₃H₇NPO₅⁻ +SC₃H₉
Molecular Wgt.: 245.23 Vapor Pressure: 4.00E-7 Torr
Melting Point: °C Boiling Point: 110°C@1AtmC
Log Kow : -5 pKₐ: @ °C
Henry's : E Atm. M3/Mol (Measured)

Solubility in ...
Water E ppm @20.0 °C Comments 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

Hydrolysis (161-1)
[V] pH 5.0: STABLE 25°C
[V] pH 7.0: STABLE 25°C
[V] pH 9.0: STABLE 25°C
[ ] pH :
[ ] pH :
[ ] pH :
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)
[V] SOIL   pH  %OM  (+)  (-)
[ ] SdIm  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)
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

Soil Partition Coefficient (Kd) (163-1)

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

Soil Rf Factors (163-1)

<table>
<thead>
<tr>
<th></th>
<th>CATION</th>
<th>ANION</th>
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<tbody>
<tr>
<td>[V]</td>
<td>SdLm</td>
<td>.06</td>
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<tr>
<td></td>
<td>Im</td>
<td>.01</td>
</tr>
<tr>
<td>[V]</td>
<td>Sd</td>
<td>.09</td>
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<tr>
<td></td>
<td>Lm</td>
<td>0.0</td>
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<td></td>
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<td>.16</td>
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Laboratory Volatility (163-2)

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Field Volatility (163-3)

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Terrestrial Field Dissipation (164-1)

<table>
<thead>
<tr>
<th></th>
<th>FIELD STUDIES CONDUCTED IN VA, CA, IO, FL; APPL 6 LBS AIA:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[V]</td>
<td>STATE  CAP(-)  TMS(+)  AMPA (CAP DEGRADATE)</td>
</tr>
<tr>
<td></td>
<td>VA  &lt;7 DAYS  NON-DETECT.  VARIABLE</td>
</tr>
<tr>
<td>[V]</td>
<td>CA, IO, FL  23-26 DAYS  30-50 DAYS  83-92 DAYS</td>
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Aquatic Dissipation (164-2)

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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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PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
SULFOSATE
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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 degrade of TMS moiety in aerobic soil study.
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