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II.D Appendices: Drinking Water Exposure

5. Chemical-Specific Fate and Transport Properties Used For the Water Exposure Models

Table II.D.5.1: Aldicarb (total residues including the sulfone and sulfoxide degradates) fate and transport properties

Property/ Parameter	Variable Name	Value	Units	References
Molecular weight	mwt	190.2	g/mol	MRID 00152095
Henry's Law Const.	henry	1.70E-10	atm-m^3/mol	Acc 255979
Vapor Pressure	vapr	1.00E-06	torr	MRID 00152095
Solubility	sol	6000.0	mg/L	Acc 255979
Kd or Koc	Kd	0.12	mL/g	Minimum non-sand value for aldicarb sulfone (MRID 43560302)
Photolysis half-life	kdp	4	days	MRID 42498201
Aerobic Aquatic Metabolism	kbacw	4 (x3) = 12	days	MRID 44592107. Single acceptable guideline study for (parent/sulfoxide/sulfone) x 3; corresponds w/ DT90
Anaerobic Aquatic Metabolism	kbacs	24	days	No data; use 2X aerobic aquatic half-life
Aerobic Soil Metabolism	asm	55	days	Revised from 2001 Aldicarb RED (Carleton); Upper 90th pct bound on mean for combined parent+sulfoxide+sulfone half-life from 19 soils in x studies (.
Hydrolysis:	pH 5	stable	days	Hydrolyzed only at pH9 (MRID 00102065).
Hydrolysis:	pH 7	stable	days	
Hydrolysis:	pH 9	>30 da	days	
Application Type	granular			
NOTES:	Modeled total aldicarb residues			Half-life values used in inputs based on combined aldicarb + sulfone + sulfoxide residues; lowest Kd of the 3 chemicals used for mobility. Assumes equal toxicity of parent, degradates
	App adjusted for granular, 15% left on surface			Assumed 15% granules left on surface. Adjusted rate to 15% of reported rate, assumed no incorporation, no drift

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Table II.D.5.2. Carbaryl fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	201.22	g/mol	
Henry's Law Const.	henry	1.28E-08	atm-m^3/mol	
Vapor Pressure	vapr	1.36E-07	torr	
Solubility	sol	32	mg/L	
Koc	Koc	196	mL/g	
Photolysis half-life	kdp	21	days	
Aerobic Aquatic Metabolism	kbacw	29.6	days	
Anaerobic Aquatic Metabolism	kbacs	216.6	days	
Aerobic Soil Metabolism	asm	12	days	
Hydrolysis:	pH 5	na	days	Stable
Hydrolysis:	pH 7	12	days	
Hydrolysis:	pH 9	0.13	days	
Method:	CAM	2	integer	
Incorporation Depth:	DEPI	0	cm	
Foliar Degradation Rate	PLDKRT	3.71	days	90% upper CI from mean of 30 studies (MRID 45860501)
Foliar Washoff Coefficient	FEXTRC	0.91		

Table II.D.5.3. Carbofuran fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	221.5	g/mol	
Henry's Law Const.	henry	2.20E-10	atm-m^3/mol	
Vapor Pressure	vapr	6.00E-07	torr	
Solubility	sol	7	mg/L	
Koc	Koc	36	mL/g	mean = 36 (n= 23, stdev =31)
Photolysis half-life	kdp	6	days	
Aerobic Aquatic Metabolism	kbacw	642	days	No data; 2X aer soil metabolism half-life
Anaerobic Aquatic Metabolism	kbacs		days	
Aerobic Soil Metabolism	asm	321	days	1 value on an acidic soil
Hydrolysis:	pH 5		days	
Hydrolysis:	pH 7	28	days	
Hydrolysis:	pH 9		days	

Table II.D.5.4. Formetanate HCL fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	258	g/mol	1997 EFED RED
Henry's Law Const.	henry		atm-m^3/mol	
Vapor Pressure	vapr	1.60E-06	torr	1997 EFED RED
Solubility	sol	500000	mg/L	1997 EFED RED
Koc	Koc	340	mL/g	1997 EFED RED
Photolysis half-life	kdp	0.33	days	8 hr/24 hr; 1997 EFED RED
Aerobic Aquatic Metabolism	kbacw	12.8	days	No data; 2X aer soil metabolism data
Anaerobic Aquatic Metabolism	kbacs		days	
Aerobic Soil Metabolism	asm	6.4	days	1997 EFED RED
Hydrolysis:	pH 5	1515	days	1997 EFED RED
Hydrolysis:	pH 7	24	days	1997 EFED RED
Hydrolysis:	pH 9	24	days	1997 EFED RED
Method:	CAM	2	integer	
Incorporation Depth:	DEPI	0	cm	

Table II.D.5.5. Methomyl fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	162	g/mol	
Henry's Law Const.	henry	1.80E-10	atm-m^3/mol	
Vapor Pressure	vapr	5.00E-05	torr	
Solubility	sol	58000	mg/L	
Koc	Koc	24	mg/L	average of range 19-34; MRID 00161884
Photolysis half-life	kdp	3	days	MRID 00161885
Aerobic Aquatic Metabolism	kbacw	7	days	MRID 43325401; 90th c.b. 4, 5
Anaerobic Aquatic Metabolism	kbacs	28	days	MRID 41384301, supported by supplemental data; 2x anaerobic soil metabolism
Aerobic Soil Metabolism	asm	79	days	90% upper c.b. of 2 studies (14, 46) (MRIDs 008568, 43217901)
Hydrolysis:	pH 5	stable (0)	days	MRID 00131249
Hydrolysis:	pH 7	stable (0)	days	MRID 00131249
Hydrolysis:	pH 9	30	days	MRID 00131249
Method:	CAM	2	integer	aerial/foliar
Incorporation Depth:	DEPI	0	cm	

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Table II.D.5.6. Oxamyl fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	219	g/mol	
Henry's Law Const.	henry	2.38E-07	atm-m^3/mol	
Vapor Pressure	vapr	3.80E-07	torr	
Solubility	sol	280000	mg/L	
Koc	Koc	6	mL/g	Mean Koc of 9 soils (Acc. No. 154748 (s), 40494(s)
Photolysis half-life	kdp	11	days	MRID 406065-15; Acc. No. 40494
Aerobic Aquatic Metabolism	kbacw	40	days	No data; assume 2X aer soil met half-life
Anaerobic Aquatic Metabolism	kbacs	7	days	MRID 428200-01 (c), 413462-01 (s), Acc. No. 4094 (s), 113366 (s)
Aerobic Soil Metabolism	asm	20	days	MRID 428200-01 (c), 413462-01 (s), Acc. No. 63012 (c), 40494 (s), 154748 (s)
Hydrolysis:	pH 5	stable	days	MRID 40605-16(c), ACC No. 40494 (s)
Hydrolysis:	pH 7	8	days	MRID 40605-16(c), ACC No. 40494 (s)
Hydrolysis:	pH 9	0.13	days	MRID 40605-16(c), ACC No. 40494 (s)
Method:	CAM	2	integer	
Incorporation Depth:	DEPI	0	cm	

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Table II.D.5.7. Thiodicarb fate and transport properties

Property/ Parameter	PRZM Variable Name	Value	Units	Comments / References
Molecular weight	mwt	354.46	g/mol	
Henry's Law Const.	henry	1.10E-06	atm-m^3/mol	
Vapor Pressure	vapr	4.30E-05	torr	
Solubility	sol	19	mg/L	
Koc	Koc	485	mL/g	average
Photolysis half-life	kdp	8	days	
Aerobic Aquatic Metabolism	kbacw	3	days	No data available; 2X aer soil met half-life
Anaerobic Aquatic Metabolism	kbacs	0.375	days	
Aerobic Soil Metabolism	asm	1.5	days	
Hydrolysis:	pH 5	78	days	
Hydrolysis:	pH 7	32	days	
Hydrolysis:	pH 9	0.50	days	
Method:	CAM	2	integer	
Incorporation Depth:	DEPI	0	cm	
NOTES	Model methomyl as degradate w/ 80% conversion			Take thiodicarb app rate * 0.80 (conversion based on soil metabolism studies). Shift app date + 2 days (asm half-life); no drift since this is transformation after app only