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**APPENDICES**

**APPENDIX A****Chemical solutions**

1. 0.01 M Calcium Chloride

Dissolve 1.47 g of calcium chloride in 1000 ml of distilled water.

2. 10 mM Phosphoric acid

Dissolve 0.68 ml of 85% (w/w) orthophosphoric acid in 1000 ml of distilled water.

3. 20 CMC Triton X-100

Dissolve 2.12 g of Triton X-100 in 1000 ml of distilled water.

4. 20 CMC Tergitol NP10

Dissolve 0.8 g of Tergitol NP10 in 1000 ml of distilled water.

5. 20 CMC Tween80

Dissolve 17.28 g of Tween80 in 1000 ml of distilled water.

6. 20 CMC Brij35

Dissolve 2.2 g of Brij35 in 1000 ml of distilled water.

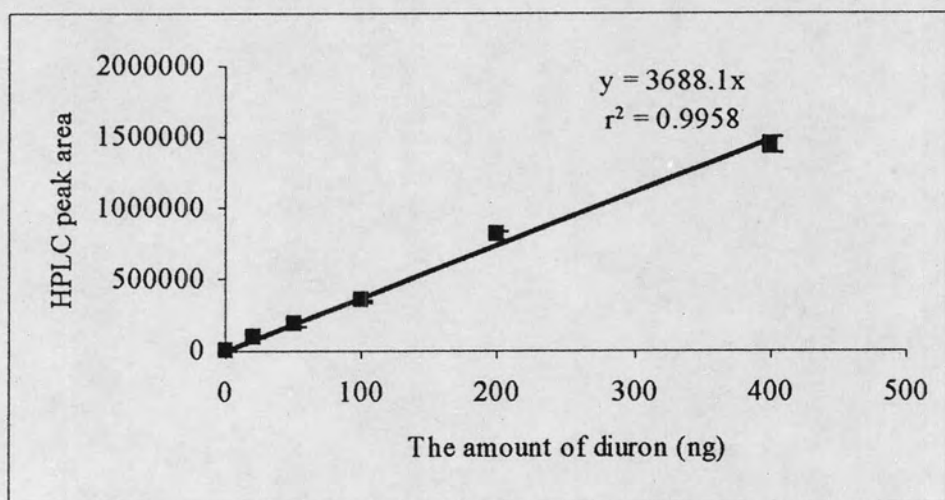
7. 2 CMC SDS

Dissolve 4.61 g of Sodium Dodecyl Sulphate in 1000 ml of distilled water.

## APPENDIX B

## Diuron standard curve

Diuron standard curve determination is shown in Method 3.10



**Figure B** The standard curve of diuron plotted between the amount of diuron (ng) and peak area analyzed by HPLC.

The slope of diuron standard curve was 3688.1

Injection volume analyzed using HPLC = 20  $\mu$ l

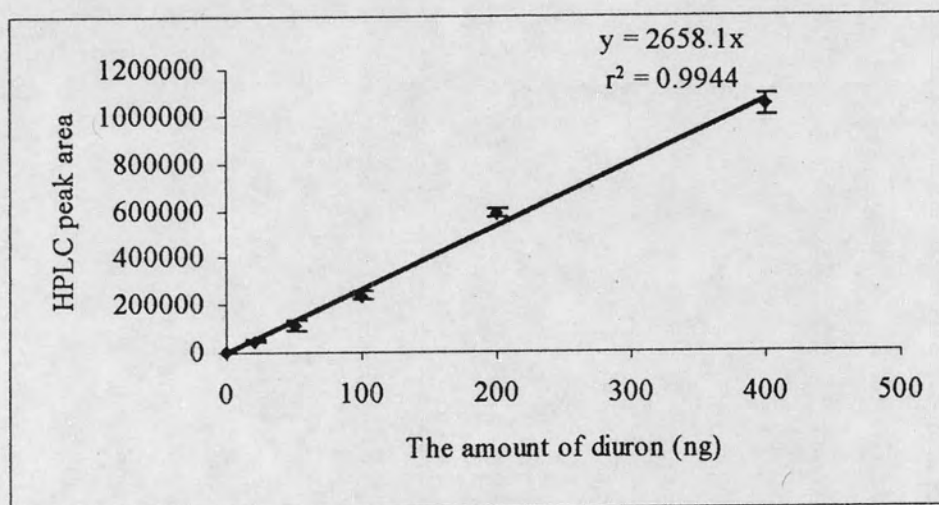
The amount of diuron in the leachate can be calculated by the following equation;

$$\text{The amount of diuron (ng.20 } \mu\text{l}^{-1}) = \text{HPLC peak area}/3688.1$$

## APPENDIX C

## Diuron80 standard curve

Diuron80 standard curve determination is shown in Method 3.10



**Figure C** The standard curve of diuron80 plotted between the amount of diuron80 (ng) and peak area analyzed by HPLC.

The slope of standard curve was 2658.1

Injection volume analyzed using HPLC = 20  $\mu$ l

The amount of diuron80 in the leachate can be calculated by the following equation;

$$\text{The amount of diuron80 (ng.20 } \mu\text{l}^{-1}) = \text{HPLC peak area}/2658.1$$



## APPENDIX D

## Raw data

## Appendix D-1 Raw Data: Adsorption Isotherm

Table D.1 Adsorption isotherm of diuron and diuron80.

diuron			
Equilibrium concentration (mg.l <sup>-1</sup> )	Concentration of diuron in solution (μg.10ml <sup>-1</sup> )	Adsorb concentration of diuron (μg.0.5g <sup>-1</sup> )	Adsorb concentration of diuron (mg.kg <sup>-1</sup> )
2.5	3.62±0.01	21.38±0.05	42.86±0.11
5	5.99±0.00	44.01±0.02	88.06±0.04
10	9.40±0.01	90.60±0.07	181.22±0.14
25	16.48±0.02	233.52±0.13	467.08±0.27
50	27.62±0.02	472.38±0.19	944.46±0.38
diuron80			
Equilibrium concentration (mg.l <sup>-1</sup> )	Concentration of diuron in solution (μg.10ml <sup>-1</sup> )	Adsorb concentration of diuron (μg.0.5g <sup>-1</sup> )	Adsorb concentration of diuron (mg.kg <sup>-1</sup> )
2.5	1.50±0.00	23.50±0.03	47.00±0.07
5	3.08±0.01	46.92±0.09	93.65±0.19
10	6.96±0.01	93.04±0.07	186.14±0.15
25	17.15±0.02	232.85±0.16	465.57±0.33
50	34.02±0.03	465.98±0.35	931.27±0.71

Table D.2 Freundlich adsorption isotherm of diuron and diuron 80.

C <sub>w</sub> <sup>*</sup> (mg.l <sup>-1</sup> )	Log C <sub>w</sub>	diuron		Diuron80	
		C <sub>s</sub> <sup>**</sup> (mg.kg <sup>-1</sup> )	Log C <sub>s</sub>	C <sub>s</sub> (mg.kg <sup>-1</sup> )	Log C <sub>s</sub>
2.5	0.40	42.86	1.63	47.00	1.67
5	0.70	88.06	1.94	93.65	1.97
10	1.00	181.22	2.26	186.14	2.27
25	1.40	467.08	2.67	465.57	2.67
50	1.70	944.46	2.98	931.27	2.97

\* Equilibrium concentration (mg.l<sup>-1</sup>)\*\* Adsorb concentration of diuron (mg.kg<sup>-1</sup>)



**Table D.3** Example of calculation of leaching efficiency of 1-week diuron-aged soil packed in soil column 1% (v/v) methanol by using HPLC analysis.

Number of fraction	Peak area	Amount of diuron (ng.10 $\mu$ l <sup>-1</sup> )	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)	Leaching efficiency (% w/w)
1	760007	206.07	1.91±0.13	9.57±0.66
	692515	187.77		
	665518	180.45		
	775792	210.35		
	702731	190.54		
	672894	182.45		
2	697936	189.24	1.72±0.17	8.59±0.86
	632030	171.37		
	571656	155.00		
	705349	191.25		
	624617	169.36		
	592088	160.54		
3	597067	161.89	1.44±0.17	7.20±0.83
	519248	140.79		
	476097	129.09		
	588399	159.54		
	509880	138.25		
	600349	162.78		
4	509732	138.21	1.22±0.15	6.10±0.74
	438589	118.92		
	402409	109.11		
	522751	141.74		
	455554	123.52		
	515781	139.85		
5	417567	113.22	1.01±0.11	5.04±0.57
	362208	98.21		
	335285	90.91		
	405138	109.85		
	369548	100.20		
	327430	88.78		
6	440101	119.33	1.08±0.10	5.38±0.51
	378620	102.66		
	371318	100.68		
	448325	121.56		
	371207	100.65		
	363905	98.67		
7	463594	125.70	1.08±0.16	5.39±0.79
	378215	102.55		
	352029	95.45		
	476281	129.14		
	370507	100.46		
	363720	98.62		
8	409527	111.04	0.93±0.16	4.64±0.81
	320975	87.03		
	295933	80.24		
	403146	109.31		
	333921	90.54		
	292245	79.24		
9	290327	78.72	0.79±0.01	3.93±0.05
	292983	79.44		
	285643	77.45		
	295970	80.25		
	304453	82.55		

	277124	75.14		
	195506	53.01		
	266023	72.13		
10	278267	75.45	0.67±0.12	3.34±0.61
	182745	49.55		
	257761	69.89		
	285275	77.35		

Calculation of leaching efficiency of diuron

HPLC peak area = 76007

From equation in Appendix B:

The amount of diuron ( $\text{ng} \cdot 20 \mu\text{l}^{-1}$ ) = HPLC peak area/3688.1

$$\begin{aligned} \text{Therefore, The amount of diuron} &= 76007/3688.1 \\ &= 206.07 \text{ ng} \cdot 20 \mu\text{l}^{-1} \end{aligned}$$

Sample mixed with mobile phase (1:1 v/v) (Method 3.9)

$$\text{Therefore, The amount of diuron} = 206.07 \text{ ng} \cdot 10 \mu\text{l}^{-1}$$

$$\text{Therefore, the amount of diuron in one fraction (100 ml)} = 2.06 \text{ mg}$$

$$\text{Initial amount of diuron in soil} = 20 \text{ mg}$$

$$\begin{aligned} \text{Therefore, leaching efficiency} &= (2.06/20) \times 100 \\ &= 10.3\% \text{ w/w} \end{aligned}$$

## Appendix D-2 Raw Data: Leaching Experiments

### Soil Column

1. As describe in Method 3.7.2.1

- Fraction number 1-5 is pretreatment fraction by calcium chloride solution.
- Fraction number 6-10 is leached diuron fraction using organic solvent or surfactant.

2. Table details can be briefly described:

Table	Leaching experiment condition
D.4	1-week diuron-aged soil using organic solvent and surfactant
D.5	1-week diuron80-aged soil using organic solvent and surfactant
D.6	1-month diuron-aged soil using organic solvent
D.7	1-month diuron80-aged soil using organic solvent
D.8	1-month diuron-aged soil using surfactant
D.9	1-month diuron80-aged soil using surfactant

**Table D.4** Leaching of 1-week diuron-aged soil packed in soil column using organic solvent and surfactant.

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	1.91	1.82	1.88	1.84	1.78	1.90	1.75
2	1.72	1.69	1.72	1.63	1.63	1.74	1.64
3	1.44	1.38	1.44	1.36	1.39	1.33	1.36
4	1.22	1.17	1.20	1.23	1.22	1.16	1.24
5	1.01	1.01	1.08	1.16	1.08	1.06	1.08
6	1.08	1.34	0.97	1.06	1.24	0.98	1.01
7	1.08	1.34	0.92	0.93	1.09	0.88	0.95
8	0.93	1.20	0.83	0.82	0.96	0.76	0.83
9	0.79	1.08	0.80	0.72	0.77	0.70	0.76
10	0.67	0.91	0.66	0.67	0.65	0.57	0.67

Number of fraction	Leaching efficiency (% w/w)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	9.57	9.12	9.38	9.22	8.90	9.50	8.74
2	8.59	8.44	8.60	8.13	8.14	8.70	8.19
3	7.20	6.92	7.20	6.80	6.93	6.63	6.80
4	6.10	5.85	5.98	6.16	6.10	5.80	6.20
5	5.04	5.05	5.39	5.79	5.42	5.30	5.40
6	5.38	6.72	4.83	5.30	6.21	4.89	5.07
7	5.39	6.71	4.59	4.63	5.47	4.40	4.77
8	4.64	5.99	4.14	4.12	4.80	3.82	4.14
9	3.93	5.38	3.98	3.61	3.85	3.48	3.82
10	3.34	4.57	3.29	3.36	3.27	2.87	3.37

**Table D.5** Leaching of 1-week diuron80-aged soil packed in soil column using organic solvent and surfactant.

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	2.90	2.57	2.49	2.69	2.66	2.81	2.61
2	2.52	2.18	2.09	2.39	2.38	2.16	2.09
3	1.83	1.74	1.74	1.77	1.84	1.82	1.75
4	1.74	1.65	1.45	1.39	1.34	1.54	1.60
5	1.42	1.21	1.32	1.32	1.20	1.30	1.36
6	1.33	1.77	1.17	1.10	1.12	1.18	1.18
7	1.16	1.26	1.02	0.89	1.10	1.05	1.03
8	1.02	1.25	0.92	0.79	0.90	0.95	0.93
9	0.88	0.69	0.84	0.70	0.79	0.89	0.82
10	0.83	0.70	0.79	0.66	0.69	0.78	0.77
Number of fraction	Leaching efficiency (% w/w)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	14.48	12.86	12.46	13.45	13.30	14.05	13.03
2	12.62	10.88	10.44	11.97	11.89	10.78	10.47
3	9.14	8.71	8.70	8.86	9.21	9.08	8.76
4	8.71	8.24	7.26	6.97	6.70	7.71	8.01
5	7.09	6.06	6.60	6.58	6.02	6.51	6.78
6	6.67	8.87	5.85	5.48	5.58	5.90	5.88
7	5.78	6.29	5.08	4.43	5.51	5.23	5.17
8	5.11	6.25	4.61	3.97	4.51	4.74	4.66
9	4.40	3.45	4.22	3.51	3.96	4.44	4.10
10	4.14	3.50	3.96	3.30	3.43	3.88	3.87



**Table D.6** Leaching of 1-month diuron-aged soil packed in soil column using organic solvent.

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	1.57	1.67	1.85	1.92	1.83	1.86
2	1.57	1.43	1.73	1.73	1.72	1.66
3	1.28	1.25	1.44	1.46	1.57	1.42
4	1.13	1.11	1.23	1.24	1.28	1.23
5	0.88	0.95	1.19	1.13	1.12	1.14
6	0.99	1.05	1.30	0.96	1.00	1.16
7	0.92	0.96	1.22	0.83	0.90	0.92
8	0.87	0.87	1.10	0.65	0.82	0.88
9	0.65	0.70	0.98	0.54	0.65	0.71
10	0.68	0.62	0.78	0.49	0.57	0.67
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	1.67	8.33	9.25	9.62	9.13	9.32
2	7.84	7.15	8.64	8.67	8.59	8.31
3	6.39	6.25	7.21	7.31	7.86	7.12
4	5.65	5.57	6.13	6.20	6.39	6.14
5	4.42	4.73	5.95	5.67	5.59	5.69
6	4.95	5.27	6.50	4.82	5.02	5.81
7	4.60	4.79	6.09	4.14	4.48	4.59
8	4.35	4.33	5.48	3.23	4.08	4.38
9	3.26	3.48	4.88	2.71	3.23	3.54
10	3.41	3.10	3.88	2.44	2.83	3.35

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	1.61	1.74	1.65	1.90	1.95	1.94
2	1.67	1.45	1.53	1.76	1.81	1.81
3	1.36	1.28	1.35	1.47	1.48	1.50
4	1.18	1.11	1.14	1.21	1.35	1.31
5	0.92	0.90	0.95	1.07	1.17	1.20
6	1.12	1.25	1.40	1.12	1.31	1.42
7	1.20	1.47	1.61	1.05	1.17	1.42
8	1.11	1.20	1.46	0.93	1.03	1.08
9	0.94	1.07	1.11	0.72	0.84	0.85
10	0.81	0.81	0.95	0.62	0.69	0.64
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	8.03	8.69	8.23	9.48	9.75	9.69



2	8.34	7.25	7.64	8.80	9.07	9.05
3	6.81	6.39	6.74	7.34	7.38	7.49
4	5.89	5.54	5.72	6.03	6.75	6.55
5	4.60	4.49	4.74	5.36	5.84	6.01
6	5.62	6.23	7.00	5.59	6.53	7.11
7	5.99	7.36	8.06	5.27	5.84	7.08
8	5.55	5.99	7.28	4.63	5.13	5.41
9	4.72	5.36	5.53	3.60	4.21	4.25
10	4.05	4.07	4.77	3.11	3.47	3.20

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	1.74	1.82	1.90	1.80	1.82
2	1.69	1.72	1.79	1.60	1.65
3	1.47	1.46	1.42	1.37	1.39
4	1.17	1.26	1.17	1.09	1.15
5	1.05	1.12	1.05	0.98	0.99
6	0.95	1.04	0.96	0.93	0.88
7	0.89	0.92	0.87	0.80	0.79
8	0.77	0.79	0.77	0.68	0.70
9	0.64	0.66	0.62	0.56	0.59
10	0.58	0.58	0.54	0.50	0.51
Number of fraction	Leaching efficiency (% w/w)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	8.71	9.11	9.51	8.98	9.09
2	8.45	8.62	8.94	8.00	8.26
3	7.34	7.29	7.12	6.86	6.95
4	5.83	6.29	5.87	5.47	5.73
5	5.24	5.61	5.25	4.92	4.95
6	4.75	5.22	4.81	4.66	4.40
7	4.45	4.59	4.34	4.00	3.97
8	3.87	3.94	3.84	3.41	3.49
9	3.20	3.30	3.12	2.79	2.93
10	2.91	2.88	2.68	2.51	2.54

**Table D.7** Leaching of 1-month diuron80-aged soil packed in soil column using organic solvent.

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	1.71	1.82	1.80	2.05	1.94	1.81
2	1.56	1.62	1.68	1.86	1.68	1.64
3	1.26	1.32	1.48	1.26	1.34	1.29

4	1.21	1.21	1.42	1.14	1.17	1.16
5	1.00	0.97	1.29	1.05	0.91	1.08
6	1.13	1.03	1.31	0.89	0.97	1.21
7	1.00	1.06	1.65	0.83	0.95	1.30
8	0.92	0.96	1.41	0.71	0.89	1.13
9	0.79	0.88	1.18	0.65	0.85	0.90
10	0.75	0.83	1.06	0.61	0.81	0.74
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	8.54	9.09	9.00	10.23	9.68	9.04
2	7.80	8.09	8.42	9.28	8.41	8.22
3	6.31	6.59	7.39	6.28	6.68	6.46
4	6.03	6.03	7.08	5.72	5.85	5.81
5	5.02	4.85	6.43	5.24	4.55	5.40
6	5.66	5.16	6.57	4.44	4.85	6.04
7	4.99	5.30	8.23	4.16	4.76	6.48
8	4.59	4.79	7.05	3.57	4.46	5.63
9	3.97	4.41	5.88	3.23	4.27	4.48
10	3.77	4.17	5.32	3.07	4.05	3.72

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	2.07	2.00	1.99	1.82	2.19	2.14
2	1.74	1.82	1.69	1.65	1.82	1.76
3	1.42	1.34	1.48	1.48	1.58	1.53
4	1.15	1.15	1.29	1.35	1.39	1.33
5	1.06	1.00	1.18	1.26	1.32	1.26
6	1.10	1.38	2.14	1.17	1.32	1.70
7	1.36	1.59	2.26	1.07	1.36	1.54
8	1.30	1.40	1.92	0.93	1.15	1.31
9	1.17	1.27	1.58	0.83	0.99	1.01
10	1.05	1.14	1.28	0.75	0.87	0.89
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	10.35	9.99	9.95	9.09	10.97	10.68
2	8.72	9.09	8.46	8.24	9.08	8.82
3	7.08	6.68	7.39	7.39	7.92	7.67
4	5.77	5.74	6.43	6.74	6.96	6.64
5	5.31	5.01	5.91	6.32	6.60	6.29
6	5.52	6.89	10.71	5.87	6.61	8.50
7	6.82	7.97	11.31	5.34	6.81	7.72
8	6.52	7.02	9.61	4.66	5.75	6.56
9	5.84	6.36	7.88	4.17	4.95	5.03
10	5.24	5.70	6.41	3.76	4.37	4.46

Number of fraction	Amount of diuron80 (mg. 100 ml <sup>-1</sup> fraction)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	1.87	1.87	1.75	1.86	1.94
2	1.58	1.49	1.55	1.68	1.58
3	1.32	1.25	1.34	1.24	1.39
4	1.22	1.20	1.18	1.18	1.22
5	1.16	1.07	1.03	1.03	1.02
6	1.07	0.99	0.93	0.88	0.91
7	1.00	0.89	0.85	0.78	0.87
8	0.92	0.87	0.80	0.72	0.76
9	0.82	0.76	0.69	0.67	0.66
10	0.72	0.75	0.67	0.59	0.63
Number of fraction	Leaching efficiency (% w/w)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	9.37	9.33	8.76	9.29	9.68
2	7.91	7.43	7.77	8.40	7.91
3	6.61	6.26	6.70	6.20	6.97
4	6.10	5.98	5.90	5.88	6.08
5	5.81	5.33	5.15	5.17	5.09
6	5.36	4.93	4.65	4.39	4.54
7	4.98	4.47	4.26	3.90	4.33
8	4.61	4.35	4.02	3.60	3.79
9	4.12	3.81	3.46	3.34	3.31
10	3.60	3.74	3.37	2.95	3.15

**Table D.8** Leaching of 1-month diuron-aged soil packed in soil column using surfactant.

Number of fraction	Amount of diuron (mg. 100 ml <sup>-1</sup> fraction)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	1.86	1.69	1.94	1.91	1.83	1.77
2	1.67	1.42	1.76	1.88	1.65	1.64
3	1.44	1.26	1.43	1.68	1.46	1.39
4	1.23	1.13	1.21	1.45	1.23	1.09
5	1.13	1.01	1.10	1.24	1.13	0.94
6	1.02	1.05	1.00	1.15	1.06	0.89
7	0.93	0.98	0.92	1.01	0.93	0.79
8	0.87	0.83	0.86	1.08	0.87	0.74
9	0.69	0.68	0.64	0.96	0.68	0.63
10	0.63	0.59	0.58	0.88	0.65	0.59
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	9.29	8.45	9.70	9.55	9.13	8.85

2	8.33	7.11	8.80	9.40	8.25	8.20
3	7.22	6.32	7.16	8.40	7.30	6.97
4	6.14	5.66	6.04	7.24	6.17	5.46
5	5.65	5.07	5.51	6.19	5.64	4.69
6	5.11	5.27	5.00	5.75	5.32	4.47
7	4.67	4.92	4.59	5.07	4.65	3.93
8	4.33	4.15	4.30	5.40	4.33	3.69
9	3.45	3.40	3.22	4.78	3.41	3.14
10	3.15	2.94	2.88	4.42	3.23	2.95

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction fraction)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	1.93	2.02	1.87	1.91	1.83	1.94
2	1.77	1.79	1.68	1.71	1.61	1.67
3	1.44	1.64	1.46	1.49	1.43	1.42
4	1.20	1.32	1.23	1.06	1.18	1.27
5	1.14	1.24	1.08	0.96	1.09	1.23
6	0.98	1.16	1.05	0.95	1.05	1.13
7	0.87	0.94	0.91	0.86	0.96	1.19
8	0.78	0.85	0.83	0.67	0.80	1.07
9	0.67	0.52	0.72	0.56	0.62	0.62
10	0.59	0.46	0.65	0.50	0.53	0.58

Number of fraction	Leaching efficiency (% w/w)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	9.63	10.09	9.36	9.54	9.14	9.69
2	8.84	8.93	8.41	8.53	8.06	8.35
3	7.22	8.21	7.31	7.45	7.13	7.10
4	6.01	6.61	6.13	5.28	5.92	6.37
5	5.68	6.18	5.42	4.79	5.44	6.13
6	4.88	5.82	5.23	4.75	5.27	5.63
7	4.35	4.69	4.57	4.31	4.79	5.95
8	3.91	4.26	4.15	3.35	4.02	5.33
9	3.35	2.60	3.62	2.79	3.12	3.09
10	2.93	2.31	3.25	2.52	2.67	2.91

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	1.92	1.89	1.85	1.91	1.79	1.64
2	1.73	1.74	1.73	1.78	1.67	1.49
3	1.52	1.54	1.44	1.55	1.38	1.22
4	1.24	1.23	1.13	1.35	1.17	1.07
5	1.09	1.06	1.03	1.19	1.07	0.95
6	0.99	1.00	0.94	1.03	1.02	1.01



7	0.93	0.65	0.84	0.91	0.91	0.93
8	0.86	0.60	0.76	0.81	0.85	0.77
9	0.75	0.52	0.63	0.61	0.73	0.61
10	0.69	0.50	0.54	0.56	0.69	0.55
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	9.58	9.47	9.23	9.54	8.97	8.18
2	8.64	8.72	8.64	8.88	8.34	7.43
3	7.60	7.72	7.20	7.73	6.92	6.11
4	6.18	6.15	5.67	6.76	5.85	5.36
5	5.46	5.28	5.17	5.96	5.34	4.75
6	4.95	4.98	4.69	5.15	5.12	5.04
7	4.65	3.27	4.22	4.55	4.57	4.67
8	4.30	2.98	3.80	4.03	4.24	3.83
9	3.75	2.62	3.14	3.05	3.63	3.06
10	3.43	2.52	2.72	2.80	3.43	2.74

**Table D.9** Leaching of 1-month diuron80-aged soil packed in soil column using surfactant.

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	2.11	1.92	1.83	1.93	2.11	2.01
2	1.85	1.58	1.59	1.79	1.85	1.74
3	1.53	1.26	1.38	1.61	1.47	1.48
4	1.30	1.21	1.23	1.47	1.27	1.21
5	1.19	1.11	1.13	1.30	1.18	1.10
6	1.13	0.99	1.09	1.36	1.05	0.98
7	1.03	0.93	0.99	1.29	1.02	0.87
8	0.87	0.85	0.95	1.11	0.89	0.74
9	0.74	0.82	0.84	0.98	0.78	0.67
10	0.68	0.78	0.80	0.94	0.68	0.61
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	10.54	9.59	9.16	9.66	10.54	10.06
2	9.24	7.89	7.97	8.94	9.27	8.68
3	7.64	6.31	6.90	8.07	7.37	7.38
4	6.50	6.05	6.16	7.34	6.33	6.05
5	5.96	5.57	5.67	6.52	5.89	5.50
6	5.63	4.96	5.47	6.82	5.27	4.89
7	5.15	4.64	4.97	6.44	5.11	4.35
8	4.36	4.25	4.75	5.54	4.45	3.69



9	3.72	4.09	4.20	4.88	3.91	3.37
10	3.39	3.89	4.02	4.69	3.41	3.06

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	1.99	2.02	2.02	2.04	2.16	1.97
2	1.80	1.83	1.79	1.74	1.82	1.81
3	1.36	1.58	1.51	1.38	1.46	1.59
4	1.15	1.42	1.25	1.19	1.22	1.46
5	1.02	1.31	1.14	1.09	1.15	1.35
6	0.96	1.24	1.12	1.07	1.07	1.29
7	0.89	1.16	1.02	0.93	1.02	1.22
8	0.81	1.07	0.91	0.77	0.88	1.01
9	0.76	0.92	0.83	0.66	0.81	0.94
10	0.67	0.81	0.73	0.59	0.69	0.88
Number of fraction	Leaching efficiency (% w/w)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	9.95	10.08	10.10	10.21	10.80	9.85
2	9.01	9.17	8.95	8.70	9.09	9.07
3	6.80	7.89	7.57	6.90	7.30	7.94
4	5.77	7.08	6.26	5.93	6.12	7.30
5	5.10	6.54	5.72	5.46	5.73	6.73
6	4.81	6.19	5.61	5.33	5.33	6.46
7	4.46	5.78	5.10	4.63	5.09	6.11
8	4.06	5.37	4.55	3.83	4.40	5.04
9	3.81	4.60	4.15	3.31	4.05	4.71
10	3.36	4.07	3.66	2.96	3.43	4.40

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	2.03	2.06	2.10	1.97	2.08	1.94
2	1.83	1.83	1.78	1.81	1.84	1.66
3	1.45	1.32	1.33	1.54	1.51	1.40
4	1.20	1.14	1.18	1.39	1.26	1.25
5	1.08	1.01	1.04	1.25	1.17	1.14
6	0.96	0.80	0.90	1.11	1.15	1.14
7	0.86	0.75	0.85	0.98	1.09	1.16
8	0.76	0.70	0.74	0.90	1.01	1.07
9	0.69	0.66	0.69	0.83	0.95	0.97
10	0.65	0.61	0.65	0.74	0.87	0.92
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS

1	10.14	10.28	10.48	9.85	10.40	9.71
2	9.14	9.13	8.88	9.07	9.18	8.32
3	7.23	6.59	6.65	7.71	7.55	6.99
4	6.00	5.72	5.90	6.97	6.30	6.23
5	5.39	5.04	5.21	6.26	5.87	5.70
6	4.81	4.02	4.52	5.56	5.76	5.72
7	4.30	3.73	4.26	4.89	5.44	5.78
8	3.78	3.51	3.71	4.52	5.03	5.36
9	3.47	3.31	3.46	4.15	4.77	4.87
10	3.23	3.07	3.23	3.70	4.33	4.61

### Shaking Condition

1. As describe in Method 3.7.2.2

- Fraction number 1 is pretreatment fraction by calcium chloride solution.
- Fraction number 2 is leached diuron fraction using organic solvent or surfactant.

2. Table details can be briefly described:

Table	Leaching experiment condition
D.10	1-week diuron-aged soil using organic solvent and surfactant
D.11	1-week diuron80-aged soil using organic solvent and surfactant
D.12	1-month diuron-aged soil using organic solvent
D.13	1-month diuron80-aged soil using organic solvent
D.14	1-month diuron-aged soil using surfactant
D.15	1-month diuron80-aged soil using surfactant

**Table D.10** Leaching of 1-week diuron-aged soil under a shaking condition using organic solvent and surfactant.

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	0.73	0.67	0.64	0.69	0.68	0.66	0.67
2	0.36	0.39	0.40	0.34	0.41	0.23	0.25

Number of fraction	Leaching efficiency (% w/w)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	36.66	33.58	31.88	34.55	34.22	32.84	33.65
2	28.52	29.48	29.31	26.20	30.99	17.14	18.73

**Table D.11** Leaching of 1-week diuron80-aged soil under a shaking condition using organic solvent and surfactant.

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	0.90	0.87	0.86	0.85	0.86	0.89	0.88
2	0.42	0.48	0.47	0.47	0.51	0.36	0.37
Number of fraction	Leaching efficiency (% w/w)						
	1% (v/v) methanol	1% (v/v) <i>n</i> -butanol	1% (v/v) toluene	2 CMC Triton X-100	2 CMC SDS	water	0.01 M CaCl <sub>2</sub>
1	45.16	43.49	42.76	42.44	43.14	44.40	43.93
2	38.11	42.46	41.35	41.07	44.85	32.65	33.11

**Table D.12** Leaching of 1-month diuron-aged soil under a shaking condition using organic solvent.

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	0.53	0.54	0.52	0.53	0.52	0.56
2	0.25	0.31	0.41	0.23	0.33	0.42
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	26.36	27.02	26.18	26.74	26.10	28.24
2	17.03	21.07	27.80	15.76	22.48	29.43

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	0.52	0.51	0.52	0.53	0.52	0.50
2	0.25	0.41	0.55	0.40	0.40	0.45
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol

1	26.13	25.45	26.24	26.70	26.01	25.09
2	17.03	27.51	37.03	27.60	27.23	30.00

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	0.50	0.49	0.50	0.50	0.52
2	0.40	0.39	0.40	0.18	0.18
Number of fraction	Leaching efficiency (% w/w)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	25.04	24.51	25.15	24.99	25.80
2	26.41	26.04	26.97	11.82	11.91

**Table D.13** Leaching of 1-month diuron80-aged soil under a shaking condition using organic solvent.

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	0.70	0.70	0.70	0.72	0.70	0.68
2	0.40	0.45	0.52	0.36	0.40	0.48
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) methanol	5% (v/v) methanol	10% (v/v) methanol	1% (v/v) ethanol	5% (v/v) ethanol	10% (v/v) ethanol
1	35.16	35.21	34.84	35.80	34.86	33.80
2	30.82	34.89	39.72	27.97	30.94	36.05

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	0.71	0.69	0.70	0.72	0.68	0.70
2	0.44	0.53	0.63	0.40	0.44	0.51
Number of fraction	Leaching efficiency (% w/w)					
	1% (v/v) <i>n</i> -butanol	5% (v/v) <i>n</i> -butanol	10% (v/v) <i>n</i> -butanol	1% (v/v) <i>sec</i> -butanol	5% (v/v) <i>sec</i> -butanol	10% (v/v) <i>sec</i> -butanol
1	35.26	34.30	35.21	36.03	34.05	34.90
2	33.82	40.63	48.83	31.33	33.40	39.51

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	0.66	0.65	0.70	0.74	0.68
2	0.47	0.49	0.43	0.30	0.32



Number of fraction	Leaching efficiency (% w/w)				
	1% (v/v) toluene	1% (v/v) benzene	1% (v/v) acetone	water	0.01 M CaCl <sub>2</sub>
1	32.91	32.53	35.03	37.12	33.75
2	34.86	36.20	33.04	23.59	24.09

**Table D.14** Leaching of 1-month diuron-aged soil under a shaking condition using surfactant.

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	0.53	0.50	0.58	0.53	0.53	0.58
2	0.28	0.27	0.30	0.37	0.27	0.27
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	26.52	25.04	28.79	26.72	26.64	29.12
2	19.25	17.71	21.01	25.55	18.13	18.86

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	0.51	0.50	0.51	0.55	0.56	0.51
2	0.27	0.31	0.28	0.26	0.27	0.35
Number of fraction	Leaching efficiency (% w/w)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	25.27	24.78	25.26	27.74	27.86	25.40
2	17.90	20.83	19.02	17.70	19.02	23.58

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	0.52	0.55	0.52	0.51	0.54	0.53
2	0.26	0.24	0.26	0.31	0.33	0.41
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	26.20	27.66	25.91	25.61	26.77	26.68
2	17.83	16.52	17.32	20.77	22.41	28.11



**Table D.15** Leaching of 1-month diuron80-aged soil under a shaking condition using surfactant.

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	0.65	0.64	0.70	0.72	0.72	0.72
2	0.46	0.40	0.46	0.51	0.41	0.39
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Triton X-100	2 CMC Triton X-100	8 CMC Triton X-100	20 CMC Triton X-100	1 CMC Tergitol NP10	2 CMC Tergitol NP10
1	32.53	32.07	34.92	36.18	35.88	36.00
2	34.05	29.66	35.60	40.39	31.60	30.74

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	0.65	0.70	0.71	0.69	0.67	0.63
2	0.39	0.44	0.41	0.35	0.42	0.50
Number of fraction	Leaching efficiency (% w/w)					
	8 CMC Tergitol NP10	20 CMC Tergitol NP10	1 CMC Tween80	2 CMC Tween80	8 CMC Tween80	20 CMC Tween80
1	32.50	34.94	35.73	34.33	33.44	31.25
2	29.01	33.66	31.61	26.51	31.54	36.06

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	0.71	0.65	0.74	0.71	0.66	0.68
2	0.37	0.35	0.37	0.44	0.51	0.52
Number of fraction	Leaching efficiency (% w/w)					
	1 CMC Brij35	2 CMC Brij35	8 CMC Brij35	20 CMC Brij35	1 CMC SDS	2 CMC SDS
1	35.71	32.32	36.85	35.67	32.91	33.88
2	28.63	25.90	29.15	34.26	38.46	39.28

### Leaching by Combination of Organic Solvent and Surfactant

1. As describe in Method 3.7.3.4
2. Table details can be briefly described:

Table	Leaching experiment condition
D.16	1-month diuron-aged soil packed in soil column
D.17	1-month diuron80-aged soil packed in soil column
D.18	1-month diuron-aged soil under shaking condition
D.19	1-month diuron80-aged soil under shaking condition

**Table D.16** Leaching of 1-month diuron-aged soil packed in soil column using combination of *n*-butanol (10% v/v) and Triton X-100 (at various concentration; 1, 2, 8 and 20 cmc).

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	1.88	1.56	1.91	1.94
2	1.65	1.41	1.65	1.73
3	1.37	1.25	1.43	1.41
4	1.20	1.11	1.30	1.21
5	1.08	0.89	1.10	1.09
6	1.41	1.52	1.44	1.45
7	1.63	1.75	1.71	1.79
8	1.37	1.26	1.45	1.46
9	1.07	1.08	1.23	1.18
10	0.90	0.88	0.96	0.97
Number of fraction	Leaching efficiency (% w/w)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	9.38	7.79	9.54	9.72
2	8.26	7.05	8.27	8.67
3	6.86	6.25	7.15	7.03
4	6.01	5.56	6.49	6.06
5	5.38	4.47	5.48	5.43
6	7.03	7.62	7.21	7.25
7	8.14	8.77	8.56	8.96
8	6.87	6.32	7.25	7.31
9	5.36	5.40	6.15	5.90
10	4.48	4.38	4.81	4.86

**Table D.17** Leaching of 1-month diuron80-aged soil packed in soil column using combination of *n*-butanol (10% v/v) and Triton X-100 (at various concentration; 1, 2, 8 and 20 cmc).

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	2.08	1.88	2.00	2.19
2	1.77	1.67	1.80	1.96
3	1.56	1.46	1.57	1.59
4	1.34	1.30	1.39	1.46
5	1.23	1.04	1.28	1.36
6	1.83	2.12	1.99	2.10
7	2.51	2.38	2.83	2.85
8	2.13	1.87	2.29	2.20
9	1.66	1.69	1.73	1.68
10	1.19	1.51	1.37	1.27
Number of fraction	Leaching efficiency (% w/w)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	10.42	9.41	10.02	10.93
2	8.85	8.35	9.00	9.78
3	7.78	7.28	7.87	7.95
4	6.69	6.50	6.96	7.30
5	6.14	5.19	6.39	6.79
6	9.15	10.59	9.95	10.52
7	12.56	11.88	14.15	14.24
8	10.63	9.35	11.44	10.99
9	8.31	8.45	8.63	8.40
10	5.94	7.56	6.83	6.33

**Table D.18** Leaching of 1-month diuron-aged soil under shaking condition using combination of *n*-butanol (10% v/v) and Triton X-100 (at various concentration; 1, 2, 8 and 20 cmc).

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	0.52	0.55	0.56	0.48
2	0.54	0.53	0.58	0.60

Number of fraction	Leaching efficiency (% w/w)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	25.75	27.47	27.91	23.75
2	36.43	36.86	40.15	39.56

**Table D.19** Leaching of 1-month diuron80-aged soil under shaking condition using combination of *n*-butanol (10% v/v) and Triton X-100 (at various concentration; 1, 2, 8 and 20 cmc).

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	0.74	0.69	0.68	0.69
2	0.60	0.63	0.71	0.65

Number of fraction	Leaching efficiency (% w/w)			
	10% (v/v) butanol + 1 CMC Triton X-100	10% (v/v) butanol + 2 CMC Triton X-100	10% (v/v) butanol + 8 CMC Triton X-100	10% (v/v) butanol + 20 CMC Triton X-100
1	36.83	34.70	34.21	34.68
2	47.17	48.01	53.65	49.48

### pH and Ionic Strength

1. As describe in Method 3.7.3.5 and 3.7.3.6
2. Table details can be briefly described:

Table	Leaching experiment condition
D.20	1-month diuron-aged soil packed in soil column in different soil pH
D.21	1-month diuron80-aged soil packed in soil column in different soil pH
D.22	1-month diuron-aged soil under shaking condition in different soil pH
D.23	1-month diuron80-aged soil under shaking condition in different soil pH
D.24	1-month diuron-aged soil packed in soil column in different ionic strength
D.25	1-month diuron80-aged soil packed in soil column in different ionic strength



D.26	1-month diuron-aged soil under shaking condition in different ionic strength
D.27	1-month diuron80-aged soil under shaking condition in different ionic strength

**Table D.20** Leaching of 1-month diuron-aged soil packed in soil column using *n*-butanol and Triton X-100 in different soil pH condition.

Number of fraction	Amount of diuron (mg.100 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	1.55	1.65	1.50	1.73	1.91	1.86
2	1.35	1.53	1.40	1.65	1.88	1.78
3	1.24	1.35	1.23	1.44	1.68	1.66
4	1.11	1.14	1.07	1.34	1.45	1.41
5	1.01	0.95	0.93	1.19	1.24	1.28
6	1.30	1.40	1.59	1.12	1.15	1.20
7	1.35	1.61	1.80	0.93	1.01	1.13
8	1.26	1.46	1.38	0.83	1.08	1.02
9	1.05	1.11	1.17	0.72	0.96	0.92
10	0.93	0.95	0.91	0.61	0.88	0.84
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	7.73	8.69	7.50	8.64	9.55	9.32
2	6.77	7.64	7.00	8.27	9.40	8.89
3	6.21	6.74	6.14	7.19	8.40	8.29
4	5.54	5.72	5.35	6.70	7.24	7.03
5	5.05	4.74	4.64	5.95	6.19	6.42
6	6.52	7.00	7.96	5.59	5.75	6.01
7	6.77	8.06	9.00	4.64	5.07	5.65
8	6.28	7.28	6.92	4.17	5.40	5.12
9	5.26	5.53	5.87	3.58	4.78	4.62
10	4.65	4.77	4.54	3.06	4.42	4.22

**Table D.21** Leaching of 1-month diuron80-aged soil packed in soil column using *n*-butanol and Triton X-100 in different soil pH condition.

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	1.84	1.99	1.85	1.61	1.93	1.92
2	1.65	1.69	1.64	1.52	1.79	1.80

3	1.45	1.48	1.49	1.40	1.61	1.60
4	1.28	1.29	1.27	1.26	1.47	1.48
5	1.09	1.18	1.04	1.19	1.30	1.31
6	1.93	2.14	2.15	1.22	1.36	1.36
7	1.95	2.26	2.36	1.09	1.29	1.26
8	1.63	1.92	1.87	0.95	1.11	1.10
9	1.52	1.58	1.56	0.86	0.98	0.97
10	1.28	1.28	1.27	0.78	0.94	0.94
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	9.18	9.95	9.27	8.04	9.66	9.58
2	8.27	8.46	8.21	7.62	8.94	9.02
3	7.24	7.39	7.44	7.01	8.07	8.01
4	6.40	6.43	6.33	6.29	7.34	7.42
5	5.43	5.91	5.21	5.93	6.52	6.55
6	9.65	10.71	10.75	6.12	6.82	6.81
7	9.76	11.31	11.78	5.46	6.44	6.30
8	8.16	9.61	9.35	4.74	5.54	5.51
9	7.61	7.88	7.78	4.29	4.88	4.86
10	6.39	6.41	6.33	3.90	4.69	4.69

**Table D.22** Leaching of 1-month diuron-aged soil under shaking condition using *n*-butanol and Triton X-100 in different soil pH condition.

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	0.52	0.52	0.48	0.43	0.53	0.47
2	0.50	0.55	0.56	0.34	0.37	0.42
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	25.96	26.24	23.94	21.73	26.72	23.69
2	33.86	37.03	37.09	22.00	25.55	27.52

**Table D.23** Leaching of 1-month diuron80-aged soil under shaking condition using *n*-butanol and Triton X-100 in different soil pH condition.

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8

1	0.70	0.70	0.64	0.65	0.72	0.68
2	0.62	0.63	0.66	0.43	0.51	0.53
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol pH6	10% (v/v) butanol pH7	10% (v/v) butanol pH8	20 CMC Triton X-100 pH6	20 CMC Triton X-100 pH7	20 CMC Triton X-100 pH8
1	35.02	35.21	32.22	32.34	36.18	33.95
2	47.44	48.83	48.47	31.75	40.39	40.43

**Table D.24** Leaching of 1-month diuron-aged soil packed in soil column condition using *n*-butanol and Triton X-100 in different ionic strength condition.

Number of fraction	Amount of diuron (mg. 100 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	1.65	2.01	1.79	1.91	1.85	1.69
2	1.53	1.74	1.51	1.88	1.74	1.58
3	1.35	1.45	1.31	1.68	1.60	1.38
4	1.14	1.17	1.16	1.45	1.37	1.27
5	0.95	1.08	1.01	1.24	1.23	1.13
6	1.40	1.15	1.13	1.15	1.15	1.18
7	1.61	1.23	1.22	1.01	1.06	1.09
8	1.46	1.05	1.05	1.08	0.95	0.98
9	1.11	0.88	0.82	0.96	0.86	0.87
10	0.95	0.64	0.55	0.88	0.77	0.80
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	8.69	10.07	8.94	9.55	9.23	8.43
2	7.64	8.69	7.53	9.40	8.70	7.92
3	6.74	7.27	6.55	8.40	7.99	6.91
4	5.72	5.85	5.79	7.24	6.86	6.34
5	4.74	5.41	5.03	6.19	6.13	5.66
6	7.00	5.75	5.66	5.75	5.76	5.89
7	8.06	6.13	6.10	5.07	5.28	5.47
8	7.28	5.26	5.24	5.40	4.77	4.90
9	5.53	4.40	4.08	4.78	4.29	4.33
10	4.77	3.18	2.76	4.42	3.86	4.01

**Table D.25** Leaching of 1-month diuron80-aged soil packed in soil column condition using *n*-butanol and Triton X-100 in different ionic strength condition.

Number of fraction	Amount of diuron80 (mg.100 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	1.99	2.07	2.07	1.93	1.90	1.87
2	1.69	1.80	1.78	1.79	1.79	1.75
3	1.48	1.58	1.57	1.61	1.61	1.58
4	1.29	1.40	1.34	1.47	1.43	1.44
5	1.18	1.24	1.18	1.30	1.31	1.29
6	2.14	1.76	2.13	1.36	1.41	1.38
7	2.26	2.07	1.86	1.29	1.31	1.29
8	1.92	1.94	1.54	1.11	1.08	1.06
9	1.58	1.53	1.33	0.98	0.98	0.98
10	1.28	1.03	1.16	0.94	0.92	0.90
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	9.95	10.34	10.33	9.66	9.48	9.33
2	8.46	9.01	8.92	8.94	8.95	8.77
3	7.39	7.88	7.86	8.07	8.03	7.88
4	6.43	6.99	6.72	7.34	7.17	7.19
5	5.91	6.19	5.89	6.52	6.56	6.46
6	10.71	8.82	10.67	6.82	7.06	6.92
7	11.31	10.33	9.30	6.44	6.57	6.43
8	9.61	9.69	7.71	5.54	5.41	5.32
9	7.88	7.66	6.66	4.88	4.92	4.89
10	6.41	5.16	5.78	4.69	4.62	4.51



**Table D.26** Leaching of 1-month diuron-aged soil under shaking condition using *n*-butanol and Triton X-100 in different ionic strength condition.

Number of fraction	Amount of diuron (mg.50 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	0.52	0.47	0.49	0.53	0.43	0.41
2	0.55	0.49	0.44	0.37	0.43	0.42
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	26.24	23.63	24.33	26.72	21.46	20.33
2	37.03	32.01	29.16	25.55	27.44	26.42

**Table D.27** Leaching of 1-month diuron80-aged soil under shaking condition using *n*-butanol and Triton X-100 in different ionic strength condition.

Number of fraction	Amount of diuron80 (mg.50 ml <sup>-1</sup> fraction)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	0.70	0.65	0.63	0.72	0.61	0.59
2	0.63	0.59	0.56	0.51	0.52	0.52
Number of fraction	Leaching efficiency (% w/w)					
	10% (v/v) butanol control	10% (v/v) butanol 0.05 M CaCl <sub>2</sub>	10% (v/v) butanol 0.1 M CaCl <sub>2</sub>	20 CMC Triton X-100 control	20 CMC Triton X-100 0.05 M CaCl <sub>2</sub>	20 CMC Triton X-100 0.1 M CaCl <sub>2</sub>
1	35.21	32.55	31.53	36.18	30.34	29.75
2	48.83	43.50	40.80	40.39	37.07	36.80

### Appendix D-3 Photodegradation

#### Photodegradation of Diuron Following a Soil Washing Process

1. As describe in Method 3.8

- Fraction number 5 is the final pretreatment fraction by calcium chloride solution.
- Fraction number 6-10 is the leached diuron fraction using organic solvent or surfactant.

2. Table details can be briefly described

Table	Photodegradation
D.28	Photodegradation of diuron following a soil washing process
D.29	Photodegradation of diuron80 following a soil washing process

**Table D.28** Photodegradation of diuron following a soil washing process using organic solvent or surfactant.

10% (v/v) methanol							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.12	0.11	0.10	0.10	0.09	0.08	0.07
6	0.13	0.11	0.10	0.10	0.08	0.07	0.06
7	0.12	0.11	0.10	0.09	0.09	0.08	0.07
8	0.11	0.10	0.09	0.08	0.07	0.07	0.06
9	0.08	0.08	0.07	0.07	0.06	0.06	0.06
10	0.08	0.07	0.07	0.07	0.06	0.06	0.05
10% (v/v) ethanol							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.12	0.11	0.11	0.10	0.08	0.08	0.07
6	0.12	0.11	0.10	0.09	0.09	0.08	0.07
7	0.11	0.10	0.10	0.09	0.08	0.08	0.06
8	0.09	0.09	0.08	0.08	0.07	0.07	0.06
9	0.08	0.07	0.07	0.07	0.06	0.06	0.06
10	0.07	0.07	0.06	0.06	0.06	0.05	0.05

10% (v/v) <i>n</i> -butanol							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.12	0.11	0.10	0.09	0.09	0.08	0.07
6	0.14	0.10	0.08	0.07	0.06	0.05	0.05
7	0.16	0.12	0.10	0.08	0.07	0.06	0.05
8	0.13	0.09	0.08	0.07	0.06	0.05	0.04
9	0.09	0.07	0.05	0.04	0.04	0.03	0.03
10	0.07	0.06	0.04	0.04	0.03	0.03	0.02
20 CMC Triton X-100							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.10	0.09	0.09	0.08	0.08	0.07	0.07
6	0.10	0.09	0.08	0.08	0.07	0.06	0.06
7	0.10	0.10	0.09	0.08	0.07	0.06	0.06
8	0.08	0.08	0.07	0.07	0.06	0.06	0.05
9	0.07	0.07	0.07	0.06	0.06	0.06	0.05
10	0.07	0.06	0.06	0.05	0.05	0.05	0.05
20 CMC Tween80							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.10	0.10	0.09	0.08	0.08	0.07	0.07
6	0.10	0.09	0.09	0.09	0.09	0.08	0.08
7	0.09	0.09	0.08	0.08	0.08	0.07	0.07
8	0.08	0.08	0.08	0.07	0.07	0.07	0.07
9	0.07	0.07	0.07	0.06	0.06	0.06	0.06
10	0.06	0.06	0.06	0.05	0.05	0.05	0.05
water							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.11	0.10	0.09	0.08	0.08	0.07	0.07
6	0.10	0.10	0.09	0.08	0.08	0.07	0.07
7	0.09	0.08	0.08	0.08	0.07	0.07	0.07
8	0.08	0.07	0.07	0.07	0.07	0.06	0.06
9	0.07	0.06	0.06	0.06	0.06	0.05	0.05
10	0.06	0.05	0.05	0.05	0.05	0.05	0.04
0.01 M CaCl <sub>2</sub>							
Number of fraction	Concentration of diuron (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.11	0.10	0.09	0.08	0.07	0.07	0.06
6	0.10	0.09	0.09	0.08	0.07	0.07	0.06
7	0.09	0.09	0.08	0.07	0.07	0.07	0.06
8	0.08	0.08	0.07	0.07	0.06	0.06	0.06
9	0.07	0.07	0.07	0.06	0.06	0.06	0.05
10	0.06	0.05	0.06	0.05	0.05	0.05	0.05

**Table D.29** Photodegradation of diuron80 following a soil washing process using organic solvent or surfactant.

10% (v/v) methanol							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.14	0.13	0.12	0.10	0.09	0.09	0.08
6	0.16	0.14	0.14	0.12	0.11	0.09	0.08
7	0.16	0.15	0.14	0.13	0.12	0.10	0.08
8	0.16	0.14	0.12	0.11	0.09	0.09	0.08
9	0.12	0.11	0.10	0.10	0.09	0.08	0.08
10	0.09	0.09	0.08	0.07	0.07	0.06	0.06
10% (v/v) ethanol							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.13	0.12	0.10	0.10	0.08	0.08	0.07
6	0.14	0.12	0.11	0.10	0.09	0.09	0.08
7	0.13	0.13	0.11	0.10	0.09	0.08	0.08
8	0.12	0.11	0.10	0.08	0.08	0.07	0.07
9	0.10	0.09	0.08	0.08	0.07	0.07	0.06
10	0.08	0.07	0.07	0.06	0.06	0.05	0.04
10% (v/v) n-butanol							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.14	0.12	0.11	0.10	0.09	0.08	0.08
6	0.21	0.19	0.14	0.11	0.09	0.07	0.05
7	0.23	0.20	0.17	0.13	0.10	0.07	0.06
8	0.18	0.14	0.11	0.10	0.07	0.05	0.04
9	0.14	0.11	0.08	0.06	0.04	0.03	0.03
10	0.12	0.09	0.07	0.05	0.04	0.03	0.03
20 CMC Triton X-100							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.14	0.12	0.11	0.10	0.09	0.09	0.08
6	0.14	0.13	0.12	0.11	0.10	0.08	0.07
7	0.14	0.12	0.11	0.09	0.08	0.07	0.06
8	0.12	0.11	0.10	0.09	0.08	0.07	0.07
9	0.11	0.10	0.09	0.08	0.08	0.07	0.07
10	0.08	0.08	0.07	0.06	0.06	0.05	0.05
20 CMC Tween80							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.13	0.12	0.10	0.10	0.09	0.09	0.08
6	0.13	0.12	0.11	0.10	0.09	0.08	0.08
7	0.13	0.12	0.11	0.11	0.10	0.09	0.08



8	0.11	0.10	0.09	0.09	0.08	0.08	0.08
9	0.09	0.08	0.07	0.06	0.06	0.05	0.05
10	0.07	0.07	0.06	0.06	0.06	0.05	0.05
water							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.13	0.11	0.10	0.09	0.09	0.08	0.07
6	0.11	0.10	0.09	0.09	0.08	0.08	0.07
7	0.09	0.08	0.08	0.07	0.07	0.07	0.06
8	0.08	0.07	0.07	0.06	0.06	0.05	0.05
9	0.07	0.06	0.06	0.05	0.05	0.05	0.04
10	0.05	0.04	0.04	0.04	0.03	0.03	0.03
0.01 M CaCl <sub>2</sub>							
Number of fraction	Concentration of diuron80 (mg. 10 ml <sup>-1</sup> fraction)						
	0 hour	4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
5	0.13	0.12	0.11	0.10	0.09	0.08	0.07
6	0.10	0.09	0.08	0.08	0.07	0.07	0.07
7	0.08	0.07	0.07	0.07	0.06	0.06	0.05
8	0.07	0.06	0.06	0.06	0.05	0.04	0.04
9	0.06	0.05	0.05	0.05	0.04	0.04	0.04
10	0.04	0.04	0.03	0.03	0.03	0.02	0.02

#### Example of calculation

Concentration of diuron80 in fraction 5 at 0 hour = 0.13 mg. 10 ml<sup>-1</sup> fraction

$$C_0 = 13 \text{ mg.l}^{-1}$$

Concentration of diuron80 in fraction 5 at 24 hour = 0.07 mg. 10 ml<sup>-1</sup> fraction

$$C = 7 \text{ mg.l}^{-1}$$

Therefore,

$$\ln(C_0/C) = \ln(13/7)$$

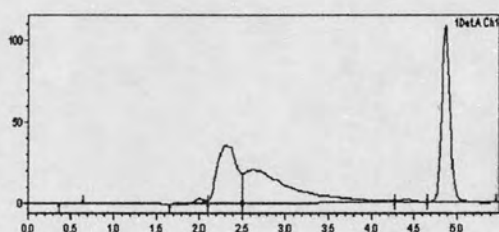
$$= 0.6$$

## Appendix D-4 Examples of HPLC Peaks

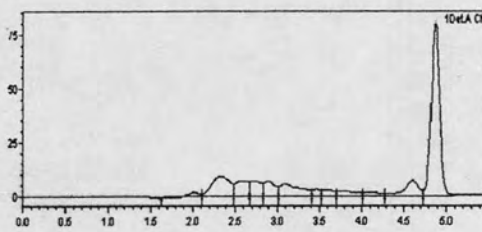
### Leaching Experiments

1. HPLC peak in each fraction of leaching of diuron- and diuron80-contaminated soil packed in soil column using 10% (v/v) *n*-butanol. Retention time of diuron is 4.9 min determined under the specific HPLC condition as described in Method 3.9
2. Fraction number 1-5 is pretreatment fraction by calcium chloride solution.  
Fraction number 6-10 is leached diuron fraction using 10% (v/v) *n*-butanol

#### Fraction number 1

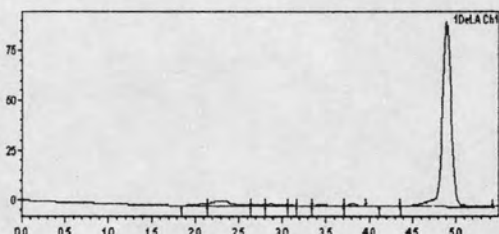


Diuron

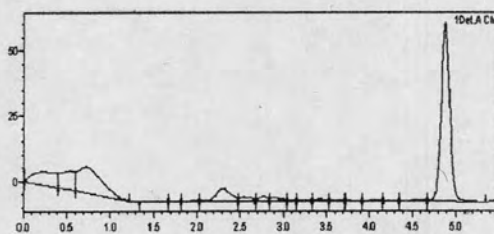


Diuron80

#### Fraction number 2

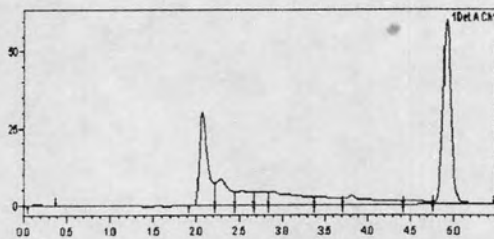
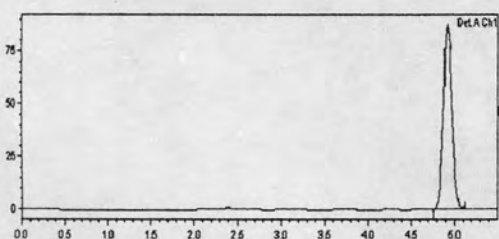


Diuron



Diuron 80

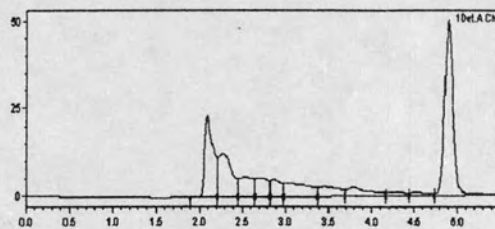
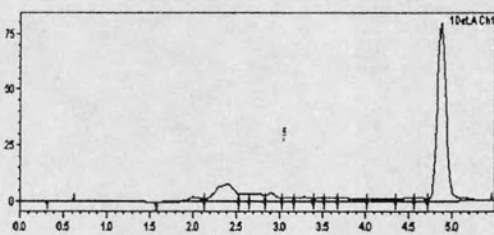
#### Fraction number 3



Diuron

Diuron 80

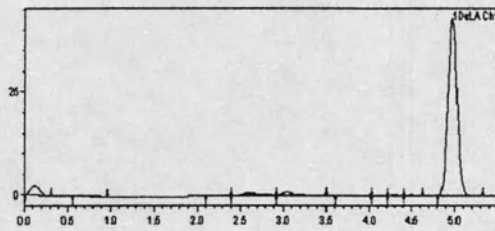
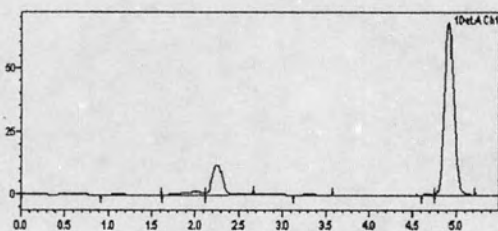
Fraction number 4



Diuron

Diuron 80

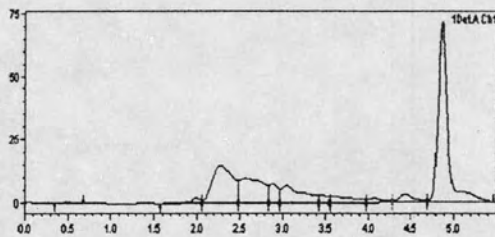
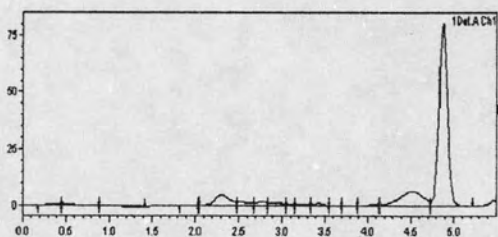
Fraction number 5



Diuron

Diuron 80

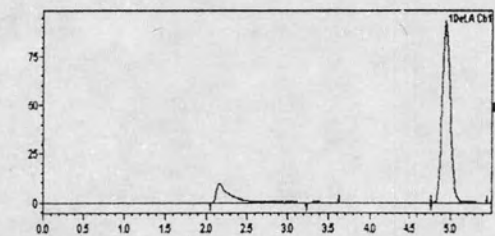
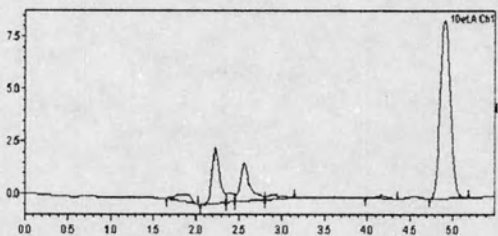
Fraction number 6



Diuron

Diuron 80

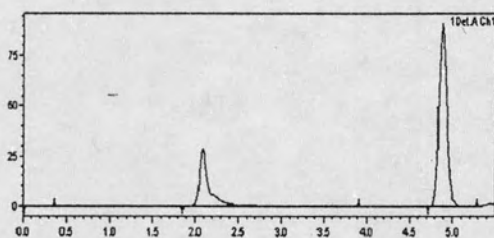
Fraction number 7



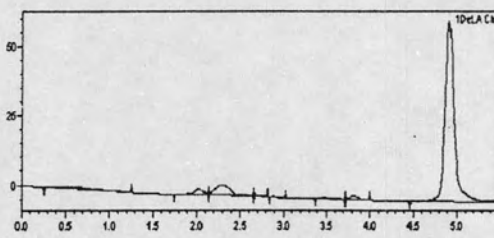
Diuron

Diuron 80

## Fraction number 8

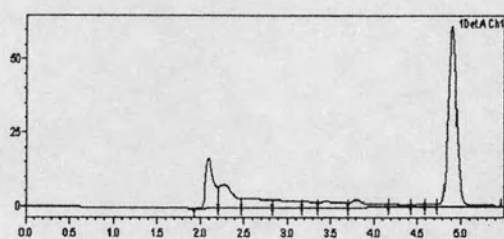


Diuron

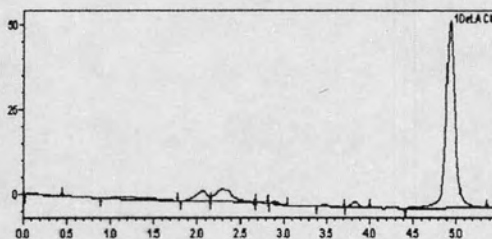


Diuron 80

## Fraction number 9

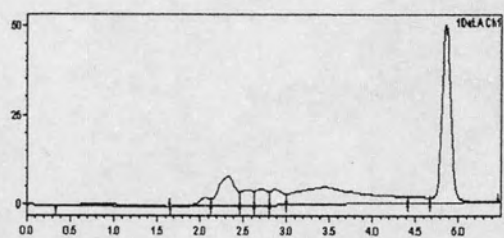


Diuron

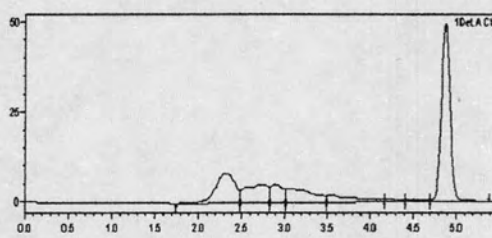


Diuron 80

## Fraction number 10



Diuron



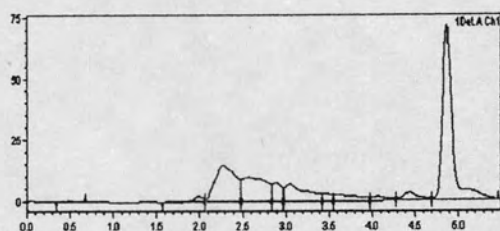
Diuron 80



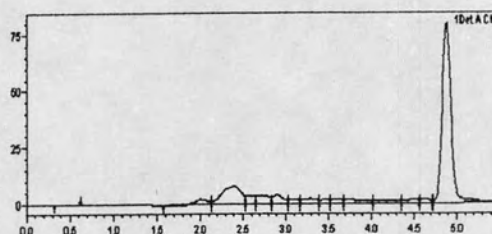
## Photodegradation Experiments

HPLC peak in each fraction of photodegradation of diuron in leached solution from diuron- and diuron80-contaminated soil washing using 10% (v/v) *n*-butanol.

0 hour

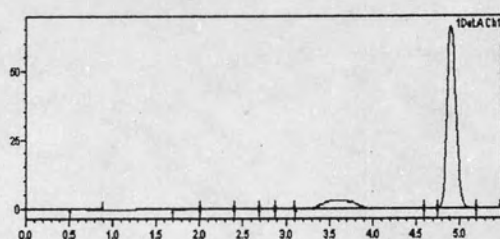


Diuron

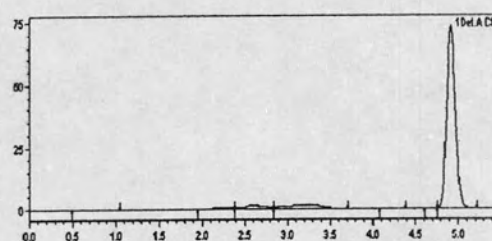


Diuron 80

4 hours

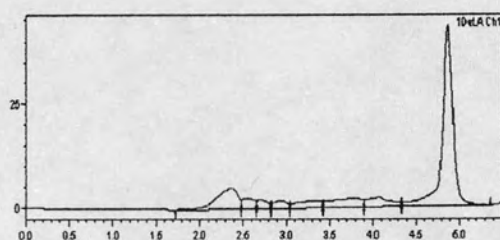


Diuron

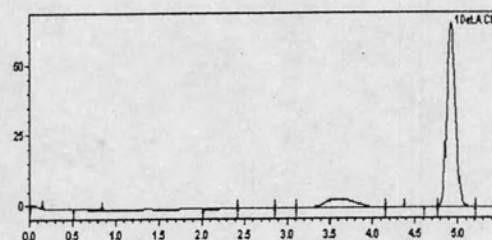


Diuron 80

8 hours

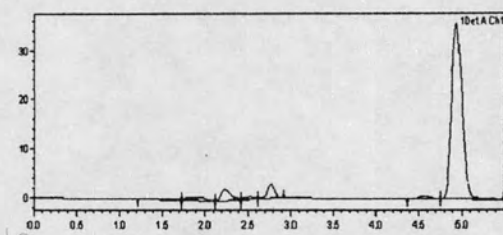


Diuron

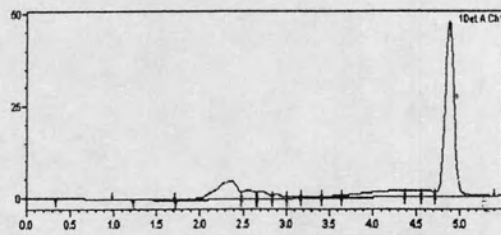


Diuron 80

12 hours

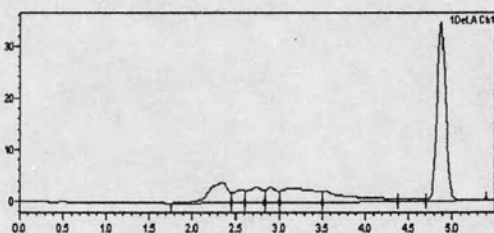


Diuron

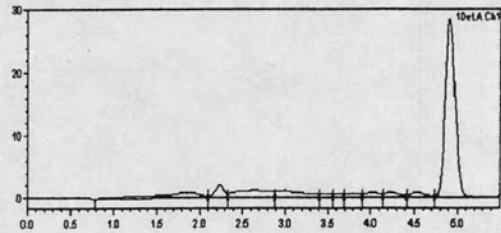


Diuron 80

16 hours

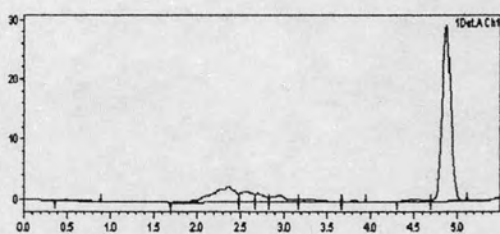


Diuron

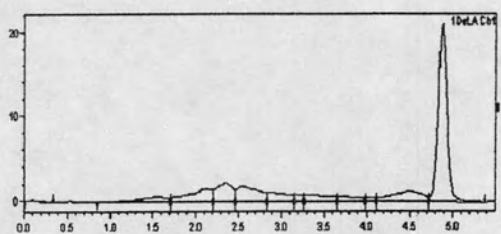


Diuron 80

20 hours

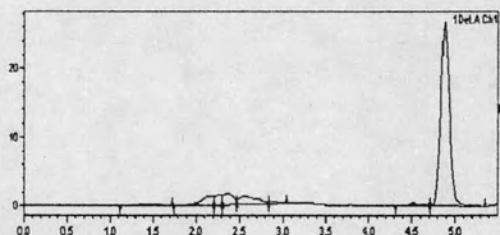


Diuron

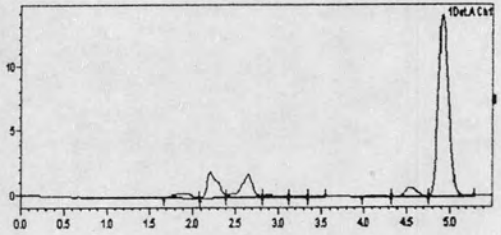


Diuron 80

24 hours



Diuron



Diuron 80

**BIOGRAPHY**

Mr. Kosin Phuempoonsathaporn was born on July 10, 1982 in Bangkok province, Thailand. He received Bachelor's Degree in Biochemistry, Faculty of science, Chulalongkorn University in 2004. He pursued his Master degree study in the Biotechnology Program, Faculty of science, Chulalongkorn University, Bangkok, Thailand in June 2004. He finished Master Degree of Science in Biotechnology Program in October 2006.