

Data of the study of percentage recovery of Cu, Cd and Pb in rainwater, drinking water and deionized water

Table 1 Analytical recovery of Cu added to some water samples

sample	conc. ($\mu\text{g L}^{-1}$)	% Recovery	mean	SD	%RSD
E blank 1	6.69		7.01	0.46	6.59
E blank 2	7.54				
E blank 3	6.8				
Rainwater 1	20.03				
Rainwater 2	12.79				
E Rainwater 1/1	30.74	107.1	101.77	4.89	4.80
E Rainwater 1/3	29.78	97.5			
E Rainwater 1/2	30.1	100.7			
E Rainwater 2/1	116.5	103.71	105.6	2.62	2.48
E Rainwater 2/2	120.2	107.41			
E Rainwater 2/3	147.5	134.71			
Drinking Water 1.1	7.54				
Drinking Water 1.2	-				
Drinking Water 2.1	14.94				
Drinking Water 2.2	-				
E Drinking Water 1/1	13.65	61.1	55.1	8.56	15.54
E Drinking Water 1/2	12.44	49			
E Drinking Water 1/3	16	84.6			
E Drinking Water 2/1	86.25	71.31	70.9	6.41	9.05
E Drinking Water 2/2	92.0	77.06			
E Drinking Water 2/3	79.20	64.26			
E Deionized Water 1/1	15.75	87.4	93.7	8.84	9.44
E Deionized Water 1/2	17	99.9			
E Deionized Water 1/3	18.83	118.2			
E Deionized Water 2/1	125.9	118.89	113.9	6.98	6.13
E Deionized Water 2/2	112.9	105.89			
E Deionized Water 2/3	123.8	116.79			

E= The samples were eluted from the column

$$\% \text{ Recovery} = \frac{\text{Founded amount}}{\text{Added amount}} \times 100$$

Table 2 Analytical recovery of Cd added to some water samples

sample	A-s	Conc ($\mu\text{g L}^{-1}$)	Conc * 10	Conc * 25	Conc minus sample	% Recovery	mean	SD	% RSD
E blank 1	0.0102	-0.04							
E blank 2	0.0091	-0.07							
E blank 3	0.0074	-0.12							
Rain water 1	0.0273	0.40							
Rain water 2	0.0401	0.72							
E Rainwater 1/1	0.0569	1.16	11.57		11.17	111.68	112.2 8	1.75	1.56
E Rainwater 1/3	0.0566	1.15	11.49		11.09	110.91			
E Rainwater 1/2	0.0579	1.18	11.83		11.43	114.25			
E Rainwater 2/1	0.0987	2.23		55.78	55.06	110.13	111.7 6	1.43	1.28
E Rainwater 2/2	0.1008	2.29		57.13	56.41	112.83			
E Rainwater 2/3	0.1004	2.28		56.88	56.16	112.31			
Drinking Water 1.1	0.0173	0.14							
Drinking Water 1.2	0.0116	-0.01							
Drinking Water 2.1	0.0226	0.28							
Drinking Water 2.2	0.0091	-0.07							
E Drinking Water 1/1	0.0497	0.97	9.72		9.58	95.77	92.56	4.54	4.91
E Drinking Water 1/2	0.0472	0.91	9.07		8.93	89.35			
E Drinking Water 1/3	0.0811	1.78	17.79		17.65	176.49			
E Drinking Water 2/1	0.0922	2.06		51.61	51.33	102.65	101.0 7	1.44	1.43
E Drinking Water 2/2	0.0900	2.01		50.19	49.91	99.83			
E Drinking Water 2/3	0.0907	2.03		50.64	50.36	100.73			
E Deionized Water 1/1	0.0535	1.07	10.69			106.94	105.0 1	2.73	2.60
E Deionized Water 1/3	0.0520	1.03	10.31			103.08			
E Deionized Water 1/2	0.0620	1.29	12.88			128.79			

Table 2(Continued)

sample	A-s	Conc ($\mu\text{g L}^{-1}$)	Conc * 10	Conc * 25	Conc minus sample	% Recovery	mean	SD	% RSD
E Deionized Water 2/1	0.0914	2.04		51.09		102.19	103.0 4	1.95	1.89
E Deionized Water 2/2	0.091	2.03		50.84		101.67			
E Deionized Water 2/3	0.0938	2.11		52.63		105.27			

Table 3 Analytical recovery of Pb added to some water samples

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. *5	conc. *10	conc. minus sample	% recovery	mean	SD	%RSD
Rainwater 1	4.54		45.4					
Rainwater 2	3.04		30.4					
E Rainwater 1/1	7.88	39.4		9	90	54.25	3.89	7.17
E Rainwater 1/3	7.11	35.6		5.15	51.5			
E Rainwater 1/2	7.22	36.1		5.7	57			
E Rainwater 2/1	13.93		139.3	108.9	108.9	101.8	9.81	9.64
E Rainwater 2/2	12.1		121	90.6	90.6			
E Rainwater 2/3	13.63		136.3	105.9	105.9			
Drinking water 1.1	2.18		21.8			13	12.45	95.73
Drinking water 1.2	0.42		4.2					
Drinking water 2.1	1.82		18.2			13.65	6.43	47.14
Drinking water 2.2	0.91		9.1					
E Drinking water 1/1	6.56	32.8		19.8	198	113.17	84.75	74.89
E Drinking water ½	4.86	24.3		11.3	113			
E Drinking water 1/3	3.17	15.9		2.85	28.5			
E Drinking water 2/1	8.22		82.2	68.55	68.55	76.35	11.03	14.45
E Drinking water 2/3	9.78		97.8	84.15	84.15			

Table 3(Continued)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. *10	conc. minus blank	% recovery	mean	SD	%RSD
E blank 1	4.61				4.68	0.10	2.12
E blank 2	4.75						
E blank 3	6						
E Deionized Water 1/1	14.4		9.72	97.2	99.70	3.54	3.55
E Deionized Water 1/2	14.9		10.22	102.2			
E Deionized Water 1/3	12.67		7.99	79.9			
E Deionized Water 2/1	14.04	140.4	135.72	135.72	128.92	9.62	7.46
E Deionized Water 2/2	12.68	126.8	122.12	122.12			
E Deionized Water 2/3	14.63	146.3	141.62	141.62			

Data for determination of Cd, Cu and Pb in rainwater samples**Table 4** The concentration of Cu in nine rainwater samples (preconcentration factor = 10, n=3)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank 1	14.1		8.21	0.368	4.48
E blank 2	8.47				
E blank 3	7.95				
E Kuanlung Cross-Road 1	15	6.79	1.78	0.099	5.56
E Kuanlung Cross-Road 2	10.06	1.85			
E Kuanlung Cross-Road 3	9.92	1.71			
E Jiranakorn Stadium 1	20.86	12.65	13.93	1.65	11.83
E Jiranakorn Stadium 2	21.56	13.35			
E Jiranakorn Stadium 3	24	15.79			
E Fountain Circus 1	31.17	22.96	12.38	2.35	18.96
E Fountain Circus 2	22.25	14.04			
E Fountain Circus 3	18.93	10.72			
E blank Prince of Songkla University1	16.47		15.79	1.28	8.11

Table 4(Continued)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank Prince of Songkla University2	14.31				
E blank Prince of Songkla University3	16.58				
E Prince of Songkla University 1	27.64	11.85	7.91	5.57	70.44
E Prince of Songkla University 2	19.76	3.97			
E Prince of Songkla University 3	101.2	85.41			
E blank 1	10.42		9.65	0.824	8.54
E blank 2	8.78				
E blank 3	9.74				
E Srinakorn School 1	13.91	4.26	3.88	0.452	11.65
E Srinakorn School 2	13.03	3.38			
E Srinakorn School 3	13.65	4			

Table 4(Continued)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E Municipal Park 1	16.65	7	7.08	0.113	1.60
E Municipal Park 2	16.81	7.16			
E Municipal Park 3	21	11.35			
E Railway Station 1	17.83	8.18	7.57	0.863	11.40
E Railway Station 2	16.61	6.96			
E Railway Station 3	21.13	11.48			
E Hat Yai Wittayalai somboonkulkanya School 1	10.97	1.32	1.48	0.226	15.29
E Hat Yai Wittayalai somboonkulkanya School 2	11.29	1.64			
E Hat Yai Wittayalai somboonkulkanya School 3	10.57	0.92			
E blank 1	7.47		7.80	0.46	5.90
E blank 2	8.12				
E blank 3	9.88				
E Makro 1	16.94	9.14	10.46	1.87	17.85
E Makro 3	19.58	11.78			
E Makro 2	29.57	21.77			

Table 5 The concentration of Cd in nine rainwater samples (preconcentration factor = 10, n=3)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank 1	0.39		0.40	0.007	1.79
E blank 3	0.4				
E blank 2	0.32				
E Kuanlung Cross-Road 1	2.9	2.5	0.75	0.014	1.89
E kuanlung Cross-Road 2	1.14	0.74			
E Kuanlung Cross-Road 3	1.16	0.76			
E Jiranakorn Stadium 1	2.74	2.34	2.25	0.13	5.98
E Jiranakorn Stadium 3	2.55	2.15			
E Jiranakorn Stadium 2	1.79	1.39			
E Fountain Circus 1	1.42	1.02	0.68	0.02	3.14
E Fountain Circus 2	1.09	0.69			
E Fountain Circus 3	1.06	0.66			
E blank Prince of Songkla University1	0.54		0.52	0.04	6.87
E blank Prince of Songkla University2	0.49				
E blank Prince of Songkla University3	0.39				
E Prince of Songkla University 1	1.55	1.03	1.56	0.01	0.91
E Prince of Songkla University 2	1.57	1.05			
E Prince of Songkla University 3	5.59	5.07			

Table 5(Continued)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank 1	0.96		0.74	0.014	1.91
E blank 2	0.75				
E blank 3	0.73				
E Srinakorn School 1	1.93	1.19	0.79	0.049	6.31
E Srinakorn School 2	1.49	0.75			
E Srinakorn School 3	1.56	0.82			
E Municipal Park 1	4.87	4.13	4.46	0.460	10.32
E Municipal Park 2	5.52	4.78			
E Municipal Park 3	4.11	3.37			
E Railway Station 1	15.6	14.86	2.88	1.181	41.07
E Railway Station 2	2.78	2.04			
E Railway Station 3	4.45	3.71			
E Hat Yai Wittayalai somboonkulkanya School 1	1.41	0.67	0.59	0.113	19.18
E Hat Yai Wittayalai somboonkulkanya School 3	1.25	0.51			
E Hat Yai Wittayalai somboonkulkanya School 2	2.11	1.37			
E blank 1	0.71		0.67	0.06	9.57
E blank 3	0.62				
E blank 2	0.84				
E Makro 1	8.34	7.67	18.61	0.15	0.80
E Makro 2	19.38	18.71			
E Makro 3	19.17	18.5			

Table 6 The concentration of Pb in nine rainwater samples (preconcentration factor = 10, n=3)

Sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank 1	6.39		1.85	0.870	47.14
E blank 2	1.23				
E blank 3	2.46				
E Kuanlung Cross-road 1	13.6	11.75	9.15	2.29	25.04
E Kuanlung Cross-road 2	12.62	10.77			
E Kuanlung Cross-road 3	9.38	7.53			
E Jiranakorn Stadium 1	103.8	101.95	57.34	18.94	33.04
E Jiranakorn Stadium 2	45.79	43.94			
E Jiranakorn Stadium 3	72.58	70.73			
E Fountain Circus 1	17.47	15.62	8.29	1.22	14.67
E Fountain Circus 2	11	9.15			
E Fountain Circus 3	9.28	7.43			
E blank Prince of Songkla University1	10.1		9.11	1.40	15.37
E blank Prince of Songkla University2	8.12				
E blank Prince of Songkla University 3	4.79				
E Prince of Songkla University1	10.5	1.39	19.67	2.55	12.94
E Prince of Songkla University2	17.87	8.76			
E Prince of Songkla University 3	21.47	12.36			

Table 6(Continued)

sample	conc. ($\mu\text{g L}^{-1}$)	conc. ($\mu\text{g L}^{-1}$) minus blank	mean	SD	% RSD
E blank 1	12.12		10.84	1.810	16.70
E blank 2	9.56				
E blank 3	5.5				
E Srinakorn School 1	64	53.16	5.21	0.672	12.91
E Srinakorn School 2	16.52	5.68			
E Srinakorn School 3	15.57	4.73			
E Hat Yai Wittayalai somboonkulkanya School 1	26.45	15.61	16.36	1.06	6.48
E Hat Yai Wittayalai somboonkulkanya School 2	27.95	17.11			
E Hat Yai Wittayalai somboonkulkanya School 3	17.52	6.68			
E Municipal Park 1	78.94	68.1	68.46	0.50	0.73
E Municipal Park 2	79.65	68.81			
E Municipal Park 3	100.35	89.51			
E railway Station 1	283.06	272.22	75.69	13.31	17.58
E railway Station 2	95.94	85.1			
E railway Station 3	77.12	66.28			
E blank 1	11.63		6.12	0.66	10.75
E blank 2	6.58				
E blank 3	5.65				
E Makro 1	228.6	222.48	345.11	15.34	4.44
E Makro 2	362.07	355.95			
E Makro3	340.38	334.26			

Table 7 The information of rainwater sample

Location	Date	Air Temp (°C) Average	Water Temp (°C) Average	Humidity (%) Average	Rainfall (mm) 24.0 hrs.	Evaporation (mm)	Dew at 10 cm. (mm)	Wind Mean Direction	Duration of sunshine (hr) Total (n)	Prevailing of ground	Code of state of ground
1. Department of Chemistry, Prince of Songkla University	15/10/2004	27.75	29.15	81.5	37	1.9	0.27	SW	5.3	แห้ง	5
2. Makro	7/12/2004	26.3	25.7	85.5	8.5	1.9	R	C	0.5	เปียกและ	3
3. Srinakorn School	8/12/2004	26.8	26.4	82	19.9	3.7	R	NE	0.8	เปียกและ	3
4. Hat Yai Municipal Park	8/12/2004										
5. Kuanlung Cross-Road	9/12/2004	25.55	24.7	92	71.5	FULL	0.15	C	0.4	เปียกและ	3
6. Fountain Circus	9/12/2004										
7. District Administrative Office	9/12/2004										
8. Jiranakorn Stadium	11/12/2004	26	26.6	81.5	2.4	2.1	R	NE	0	เปียกและ	3
9. Hat Yai Railway Station	11/12/2004										