

TABLE 1. Dependence of concentrations (milligrams per liter) of soluble lead and cadmium on pH in aerated aqueous suspensions of mixed lead, cadmium, and copper sulfides.

Metal	Time (days)	Treatment ¹	pH				
			5	6	7	8	9
Cd(II)	1	Cent.	0.00	0.17	0.16	0.11	0.11
	7	Cent.	2.88	0.98	0.62	0.71 ²	0.25
	11	Cent.	3.32	0.25	0.25	3.10 ²	1.03 ²
	17	Cent.	4.00	0.52	0.30	0.08	0.15
	21	0.45 μ m	5.70	2.11	0.98	0.84	1.41
	28	0.45 μ m	19.80	4.50	6.10	6.60	4.80
Pb(II)	1	Cent.	0.00	0.00	0.00	0.00	0.00
	7	Cent.	6.77	1.18	1.18	0.88	0.00
	11	Cent.	5.65	1.30	1.30	3.90 ²	1.74 ²
	17	Cent.	18.20	2.27	1.40	0.91	0.50
	21	0.45 μ m	17.40	2.17	20.40	13.90	6.50
	28	0.45 μ m	36.00	34.40	20.40	10.40	4.80

¹Cent. = sample was centrifuged; 0.45 μ m = sample was filtered through a 0.45- μ m membrane filter.

²Questionable value due to presence of particulate matter that had not settled after centrifuging.

These results suggest that the immobilization of Cd and Pb by the use of hydrogen sulfide in the restoration of groundwater quality following mining operations is a temporary solution only and that one may expect the sulfides of these metals to go into solution after the natural groundwater flow has put the precipitated sulfides in contact with water which contains dissolved oxygen. Significant oxidation of these sulfide suspensions was observed after a month or less of aeration.

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TABLE 2. Concentrations (milligrams per liter) of soluble cadmium and lead in replicate treatments (samples filtered through a 0.45- μ m membrane filter) at pH 5.

Metal	Time (days)	Replicate			
		1	2	3	4
Cd(II)	1	0.93	0.39	1.10	0.23
	5	29.50	4.40	5.90	2.32
	8	50.20	8.40	8.40	5.90
	12	67.00	18.10	24.40	8.40
Pb(II)	1	5.60	3.20	6.40	2.40
	5	25.50	19.60	23.10	18.00
	8	25.80	24.20	24.60	25.00
	12	33.20	29.60	30.40	32.40