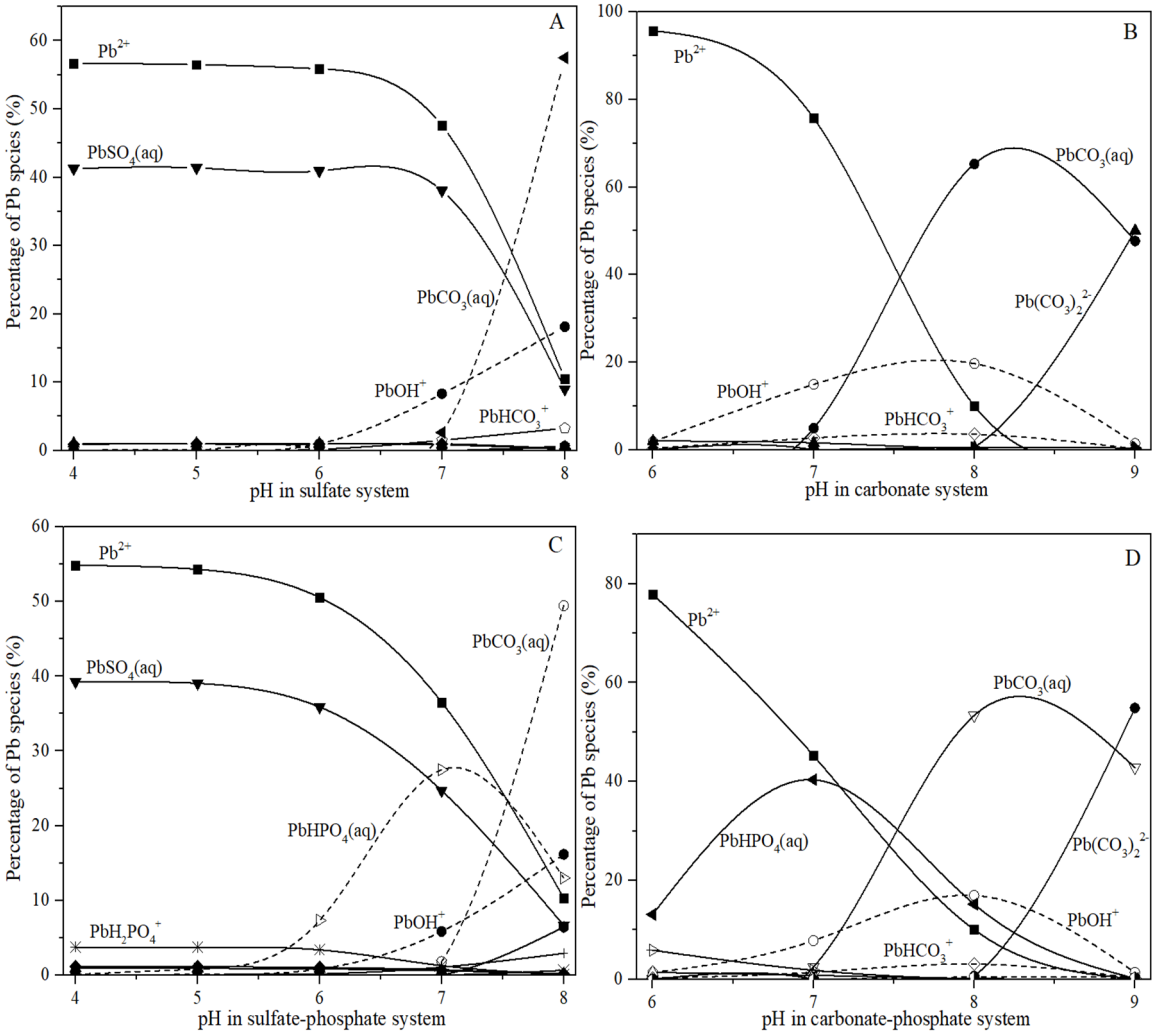

Figure S1. Percentage of Pb species in Pb solution containing sulfate, carbonate, sulfate-phosphate and carbonate-phosphate as a function of pH. The speciation data were created using the Visual MINTEQ model assuming equilibrium with 400 ppmv CO_2.

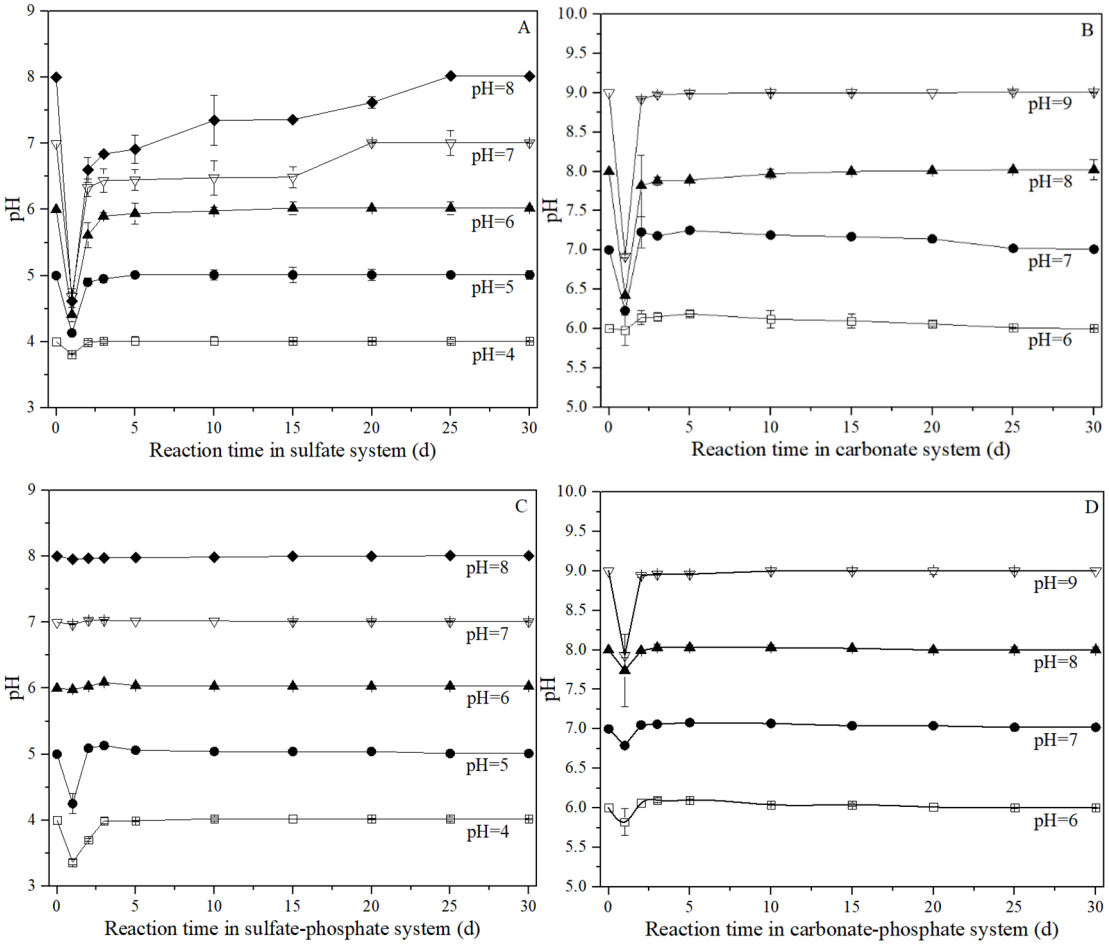

Figure S2. Variation of pH in Pb solution containing sulfate, carbonate, sulfate-phosphate and carbonate-phosphate as a function of reaction time. Error bars represent the standard deviation of three replicates.

Table S1. Percentage distribution among dissolved Pb species in the four systems at equilibrium with atmospheric CO_2 as a function of pH using Visual MINTEQ program.

System	Speciation	Percentage (%)					
		pH = 4	pH = 5	pH = 6	pH = 7	pH = 8	pH = 9
PO_4	Pb^{2+}	90.4	88.7	75.8	42.2	9.37	
	$PbOH^+$	0.02	0.17	1.43	7.73	16.6	
	$PbNO_3^+$	1.83	1.80	1.52	0.81	0.17	
	$Pb(OH)_2$ (aq)				0.02	0.47	
	$PbH_2PO_4^+$	7.63	7.52	6.37	1.92	0.08	
	$PbHPO_4$ (aq)	0.17	1.72	14.6	43.4	16.8	
	$PbHCO_3^+$		0.03		1.40	3.00	
	$PbCO_3$ (aq)			0.05	2.50	52.9	
	$Pb(CO_3)_2^{2-}$			0.26		0.59	
SO_4	Pb^{2+}	56.7	56.5	55.9	47.6	10.5	
	$PbOH^+$	0.01	0.10	0.99	8.33	18.1	
	$PbNO_3^+$	1.04	1.04	1.03	0.86	0.19	
	$PbSO_4$ (aq)	41.3	41.4	40.9	38.1	9.00	
	$Pb(SO_4)_2^{2-}$	0.96	0.97	0.96	1.00	0.26	
	$Pb(OH)_2$ (aq)				0.02	0.51	
	$PbHCO_3^+$		0.02	0.18	1.51	3.28	
	$PbCO_3$ (aq)			0.03	2.66	57.5	
	$Pb(CO_3)_2^{2-}$					0.66	
CO_3	Pb^{2+}			95.7	75.7	10.0	0.08
	$PbOH^+$			1.88	14.9	19.7	1.47
	$PbNO_3^+$			2.01	1.61	0.21	
	$PbCO_3$ (aq)			0.06	4.96	65.3	47.7
	$PbHCO_3^+$			0.34	2.71	3.57	0.27
	$Pb(CO_3)_2^{2-}$					0.64	50.1
	$Pb(OH)_2$ (aq)				0.04	0.58	0.42
	Pb_2OH^{3+}			0.02			
SO_4-PO_4	Pb^{2+}	54.9	54.3	50.6	36.5	10.3	
	$PbOH^+$		0.09	0.82	5.83	16.2	
	$PbNO_3^+$	0.91	0.90	0.83	0.58	0.16	
	$PbSO_4$ (aq)	39.3	39.1	35.9	24.7	6.65	
	$Pb(SO_4)_2^{2-}$	1.12	1.12	1.03	0.71	0.19	
	$Pb(OH)_2$ (aq)				0.02	0.44	
	$PbHPO_4$ (aq)	0.08	0.80	7.32	27.5	13.0	
	$PbH_2PO_4^+$	3.73	3.69	3.38	1.28	0.06	
	$PbHCO_3^+$		0.02	0.15	1.06	2.93	
	$PbCO_3$			0.03	1.80	49.5	
	$Pb(CO_3)_2^{2-}$					0.65	
CO_3-PO_4	Pb^{2+}			77.9	45.3	10.1	0.09
	$PbOH^+$			1.38	7.83	17.0	1.39
	$PbNO_3^+$			1.43	0.80	0.17	
	$PbCO_3$ (aq)			0.04	2.49	53.4	42.8
	$PbHCO_3^+$			0.25	1.42	3.07	0.25
	$Pb(CO_3)_2^{2-}$					0.64	54.9
	$Pb(OH)_2$ (aq)				0.02	0.47	0.38
	$PbHPO_4$ (aq)			13.1	40.4	15.2	0.14
	$PbH_2PO_4^+$			5.87	1.82	0.07	
	$Pb_3(OH)_4^{2+}$						0.08