

Dissolution of Poorly Soluble Uranyl Phosphate Phases in the Meta-autunite Group in Uranyl Peroxide Cage Cluster Forming Conditions

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Supporting Information

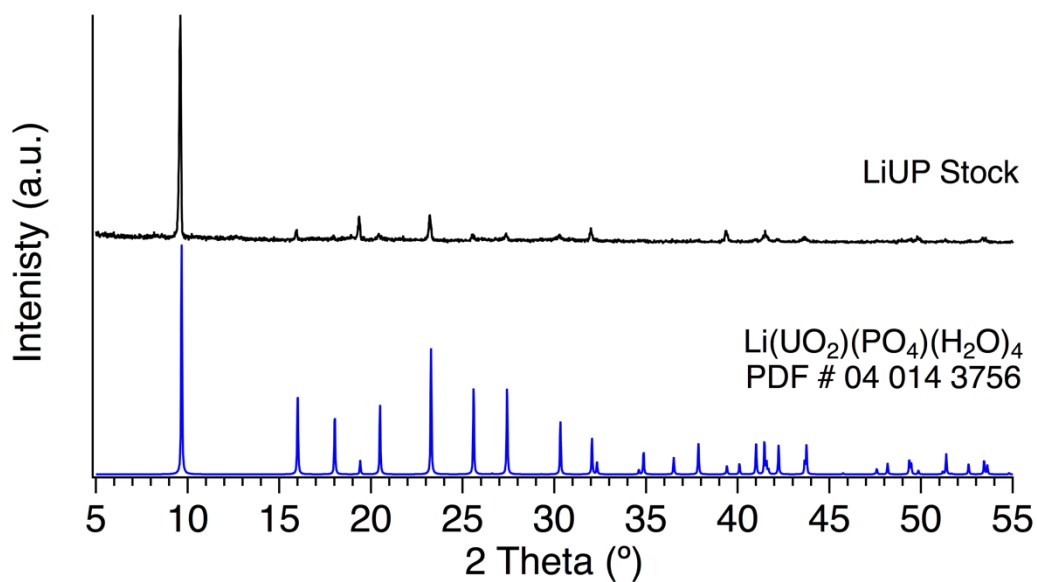


Figure S1. PXRD spectra of synthesized LiUP phase matched with PDF # 04-014-3756.

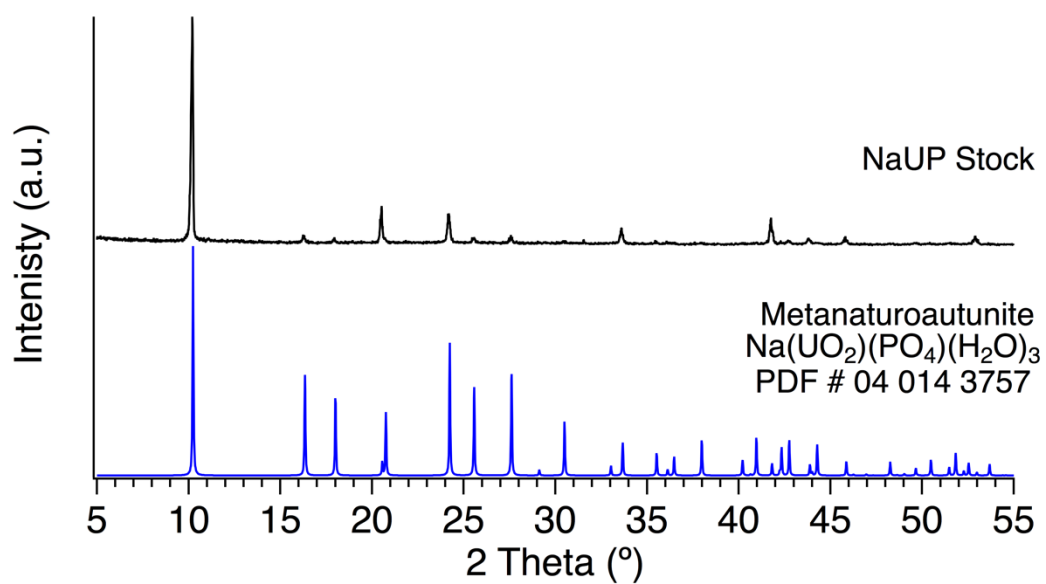


Figure S2. PXRD spectra of synthesized NaUP phase matched with PDF # 04-014-3757.

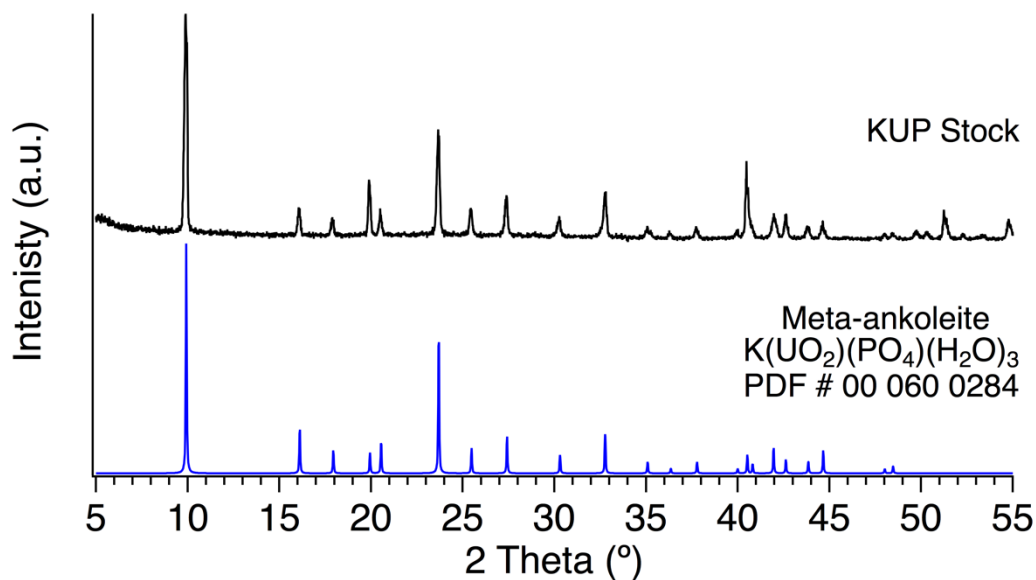


Figure S3. PXRD spectra of synthesized KUP phase matched with PDF # 00-060-0284.

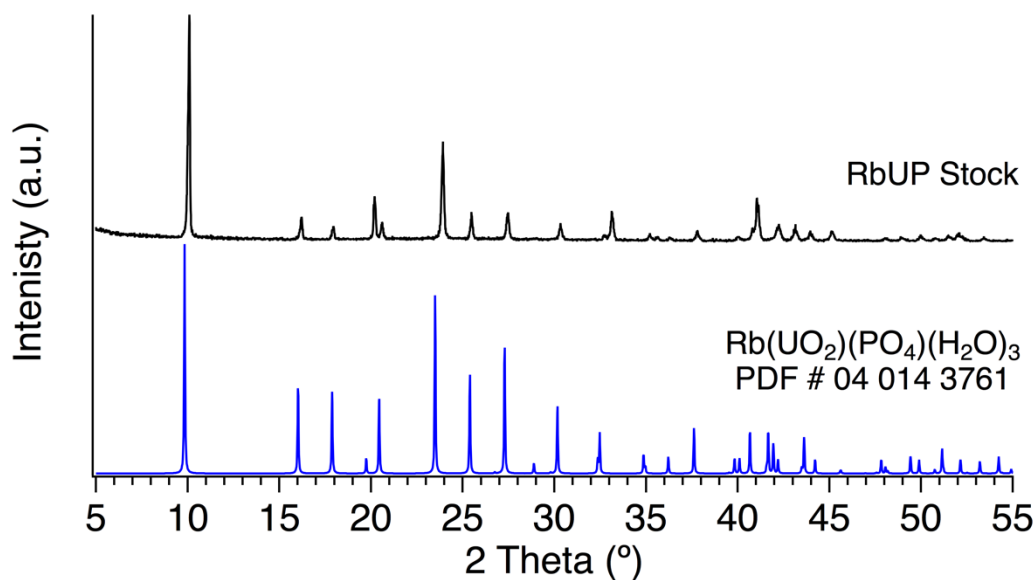


Figure S4. PXRD spectra of synthesized RbUP phase matched with PDF # 04-014-3761.

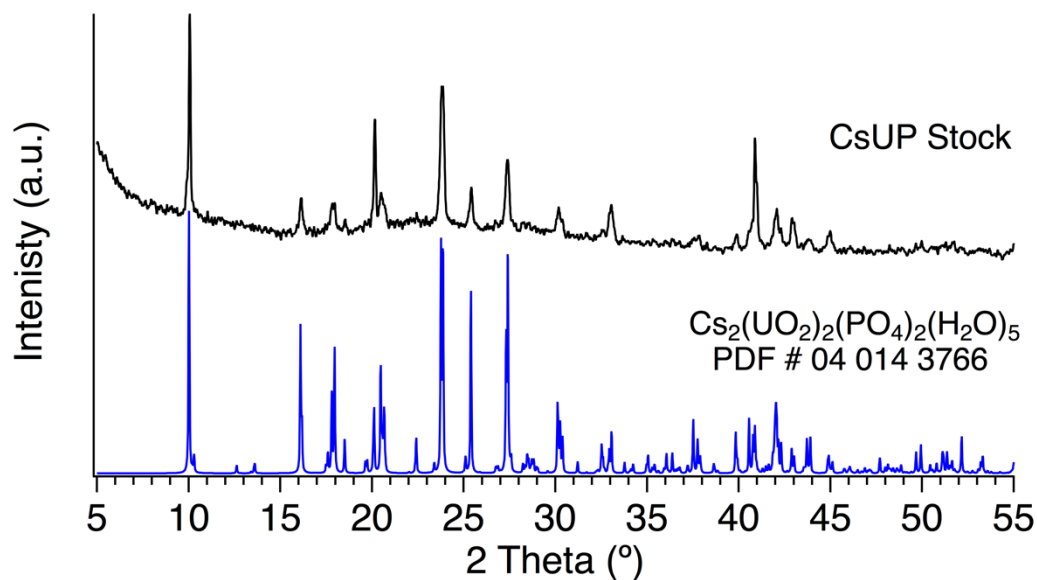


Figure S5. PXRD spectra of synthesized CsUP phase matched with PDF # 04-014-3766.

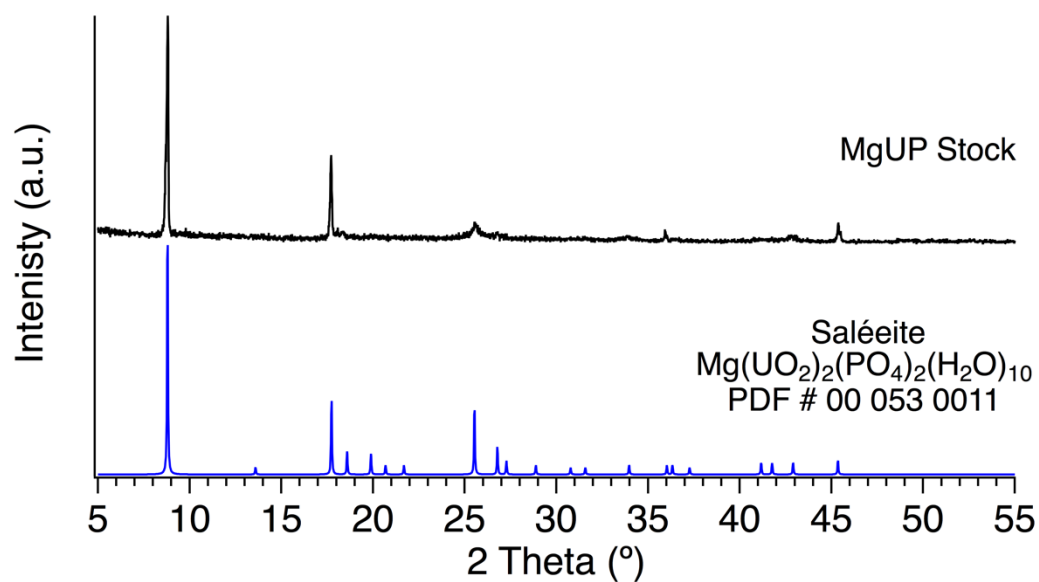


Figure S6. PXRD spectra of synthesized MgUP phase matched with PFD # 00-053-0011.

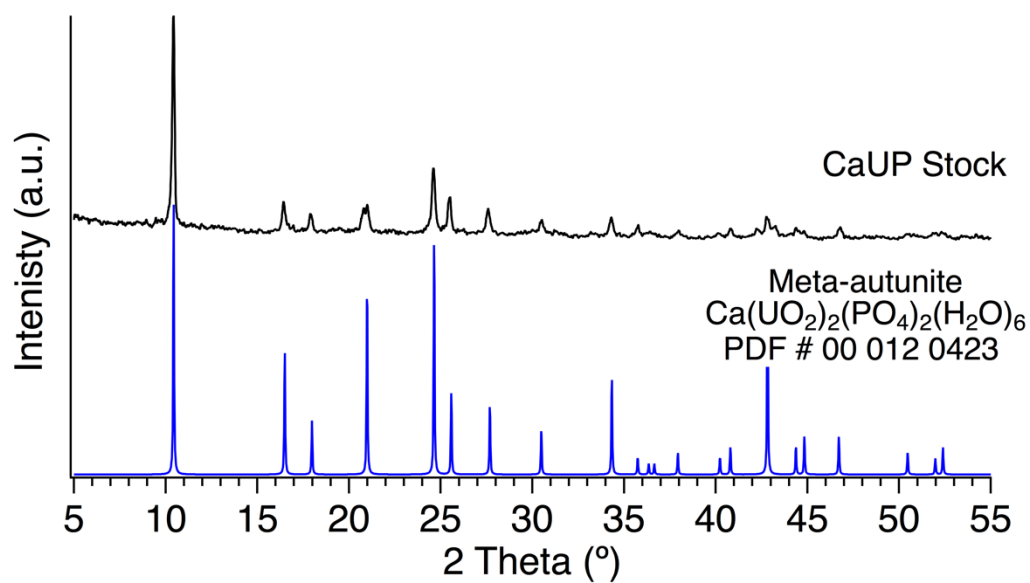


Figure S7. PXRD spectra of synthesized CaUP phase matched with PDF # 00 012 0423.

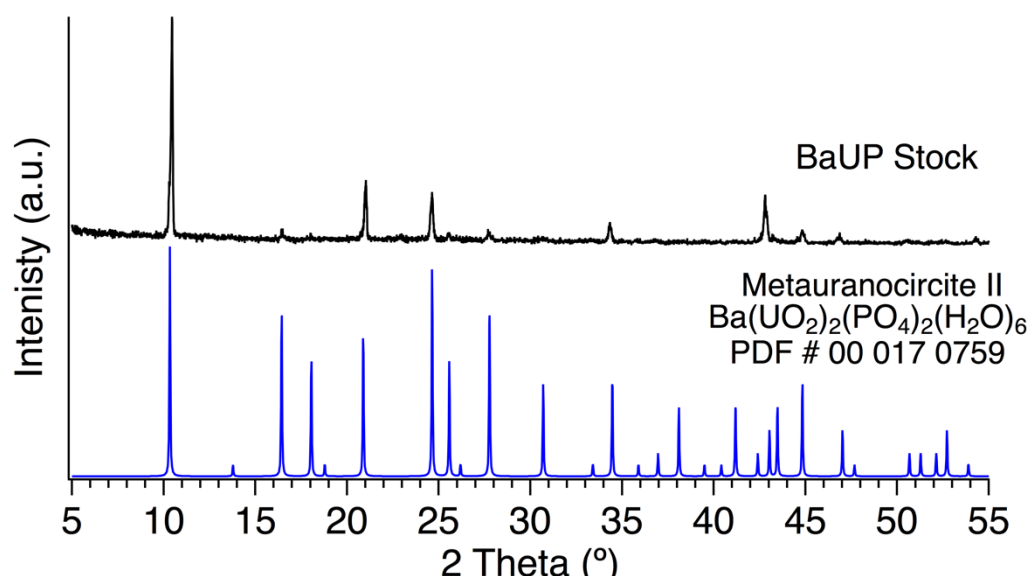


Figure S8. PXRD spectra of synthesized BaUP phase matched with PDF # 00 017 0759.

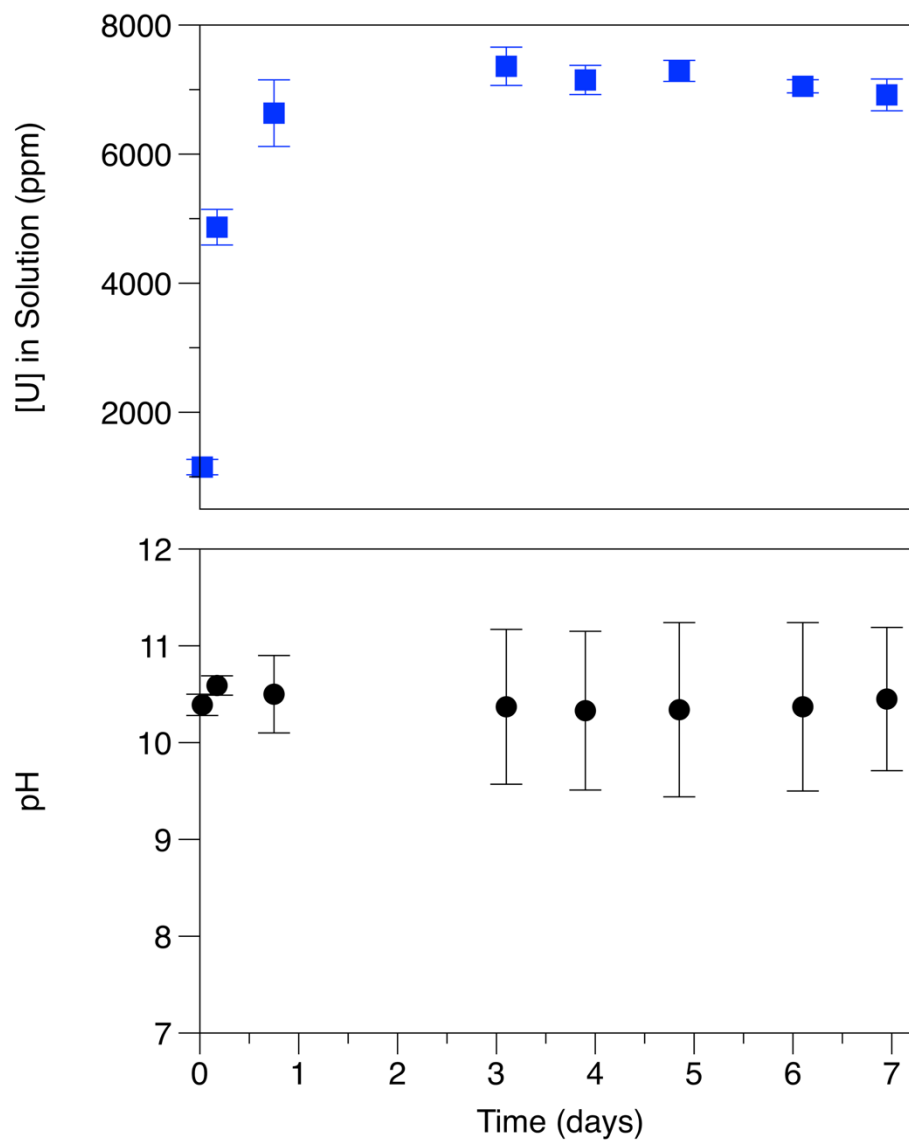


Figure S9. Time resolved study of the dissolution of *CaUP* in 1.0 M peroxide at pH greater than 10. Error bars are derived from the standard deviation of triplicate reactions. Solution pH was not adjusted in these reactions after the initial addition of TEAOH at $t = 0$ to avoid dilution of the sample.

Table S1. Percentage of total uranium detected in solution after LiUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H ₂ O ₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	0.2 ± 0.0	0.3 ± 0.2	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	< 0.1	0.6 ± 0.1	< 0.1	< 0.1	< 0.1	1.4 ± 2.0
	9	0.4 ± 0.1	0.7 ± 0.2	< 0.1	0.2 ± 0.1	2.9 ± 1.0	3.4 ± 2.3
	10	0.2 ± 0.1	1.5 ± 0.7	4.1 ± 3.6	3.3 ± 1.8	36 ± 4	67 ± 7
	11	16 ± 5	14 ± 8	22 ± 12	33 ± 2	98 ± 8	103 ± 6

Table S2. Percentage of total uranium detected in solution after NaUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H ₂ O ₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	0.3 ± 0.1	0.5 ± 0.3	< 0.1	< 0.1
	7	< 0.1	0.7 ± 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	0.3 ± 0.2	1.8 ± 1.7	< 0.1	< 0.1	4.0 ± 5.5	4.1 ± 5.5
	9	2.5 ± 2.7	4.7 ± 1.3	< 0.1	0.8 ± 0.1	7.4 ± 10.1	5.2 ± 0.6
	10	1.8 ± 1.5	7.5 ± 1.4	0.4 ± 0.2	26 ± 10	54 ± 19	81 ± 9
	11	8.4 ± 1.2	12 ± 3	9.4 ± 1.4	88 ± 7	102 ± 1	101 ± 2

Table S3. Percentage of total uranium detected in solution after KUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

[U] (ppm)		Initial H ₂ O ₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2 ± 0.2
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	0.3 ± 0.4	< 0.1	< 0.1	< 0.1	0.4 ± 0.2	0.8 ± 0.5
	9	1.1 ± 1.5	< 0.1	< 0.1	0.3 ± 0.2	0.8 ± 0.4	5.9 ± 4.1
	10	1.1 ± 1.7	0.3 ± 0.3	1.0 ± 0.7	2.2 ± 1.2	23 ± 3	13 ± 10
	11	1.6 ± 1.7	3.8 ± 3.9	8.8 ± 4.6	24 ± 6	37 ± 2	52 ± 13

Table S4. Percentage of total uranium detected in solution after RbUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H ₂ O ₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	0.2 ± 0.1	< 0.1	< 0.1	< 0.1	0.2 ± 0.1	0.4 ± 0.2
	9	1.2 ± 1.5	< 0.1	< 0.1	0.2 ± 0.0	1.3 ± 0.9	4.2 ± 3.7
	10	3.2 ± 3.7	1.4 ± 0.3	6.8 ± 8.8	5.0 ± 4.0	31 ± 7	29 ± 9
	11	3.4 ± 3.4	4.6 ± 3.9	11 ± 9	34 ± 10	49 ± 1	51 ± 12

Table S5. Percentage of total uranium detected in solution after CsUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H₂O₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	< 0.1	< 0.1	< 0.1	< 0.1	0.5 ± 0.3	0.9 ± 1.1
	9	< 0.1	< 0.1	0.2 ± 0.0	0.5 ± 0.2	3.1 ± 1.6	3.2 ± 0.9
	10	1.1 ± 0.5	0.4 ± 0.3	0.8 ± 0.3	2.6 ± 1.6	5.4 ± 1.1	7.3 ± 2.1
	11	0.5 ± 0.6	1.6 ± 0.5	3.3 ± 2.8	7.4 ± 2.8	13 ± 9	19 ± 6

Table S6. Percentage of total uranium detected in solution after MgUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H₂O₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	9	< 0.1	< 0.1	< 0.1	< 0.1	3.3 ± 1.6	14 ± 3
	10	1.3 ± 0.6	0.4 ± 0.2	0.7 ± 0.1	5.3 ± 1.9	20 ± 1	25 ± 1
	11	2.3 ± 1.0	3.4 ± 2.0	13 ± 4	23 ± 4	39 ± 11	59 ± 8

Table S7. Percentage of total uranium detected in solution after CaUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H₂O₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	0.2 ± 0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2 ± 0.4
	9	0.4 ± 0.3	< 0.1	< 0.1	1.1 ± 1.8	4.2 ± 6.3	11 ± 13
	10	2.1 ± 1.8	1.0 ± 1.4	1.8 ± 0.9	8.7 ± 4.5	43 ± 6	51 ± 8
	11	3.3 ± 1.5	11 ± 14	14 ± 4	32 ± 5	55 ± 6	55 ± 4

Table S8. Percentage of total uranium detected in solution after BaUP solid reacted with peroxide solutions of variable concentration at different pH values for seven days. Error was derived from the standard deviation of replicate reactions.

U Dissolved (%)		Initial H₂O₂ Concentration					
		Water Only	0.01 M	0.035 M	0.10 M	0.50 M	1.00 M
pH	Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	9	< 0.1	< 0.1	< 0.1	< 0.1	0.6 ± 0.2	1.7 ± 0.5
	10	0.4 ± 0.2	< 0.1	0.5 ± 0.1	1.3 ± 1.1	19 ± 1	20 ± 6
	11	0.2 ± 0.2	0.9 ± 0.7	2.9 ± 1.6	10 ± 5	29 ± 4	37 ± 6

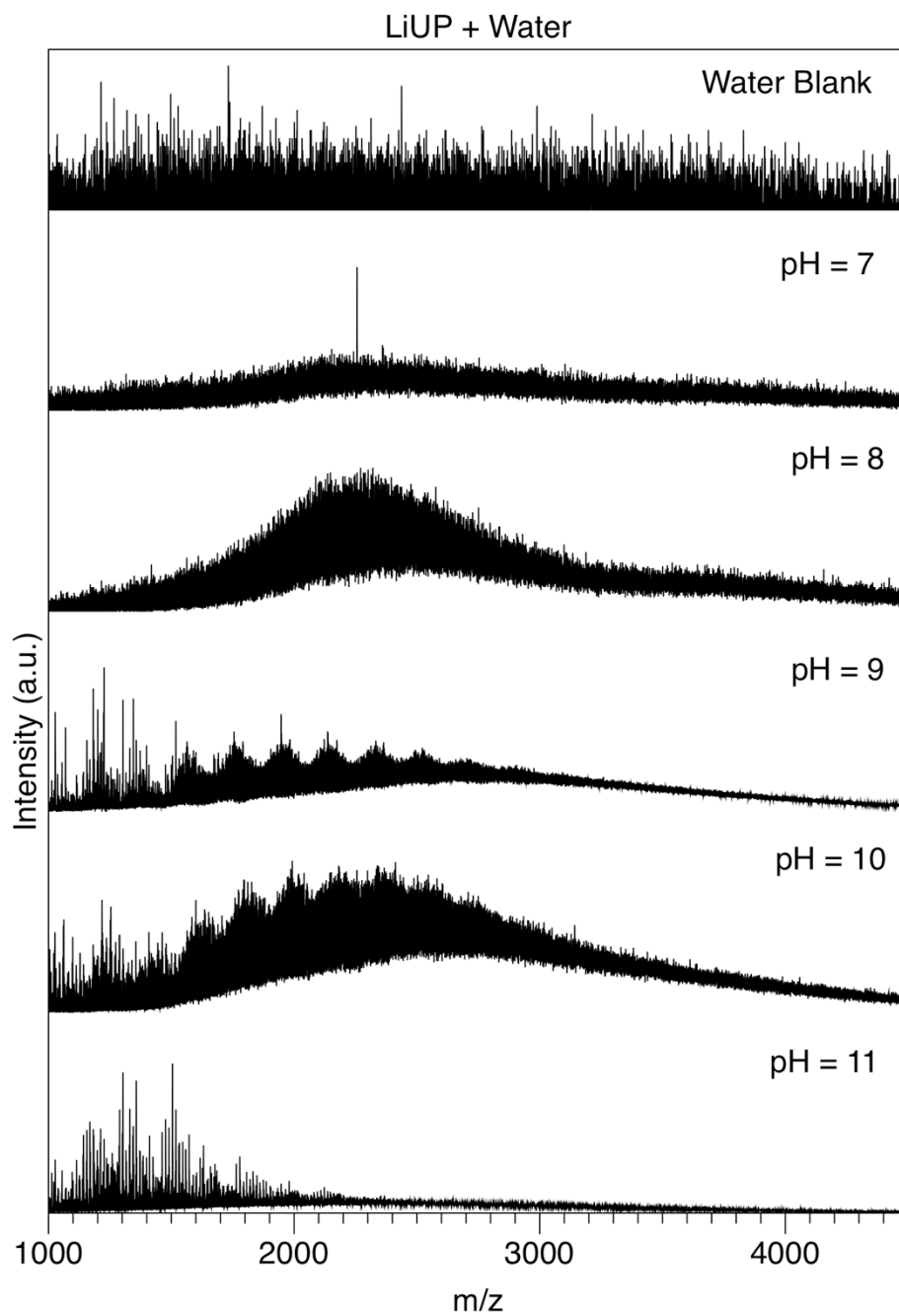


Figure S10. ESI-MS data from solutions resulting from mixing LiUP with water at pH 7 to 11.

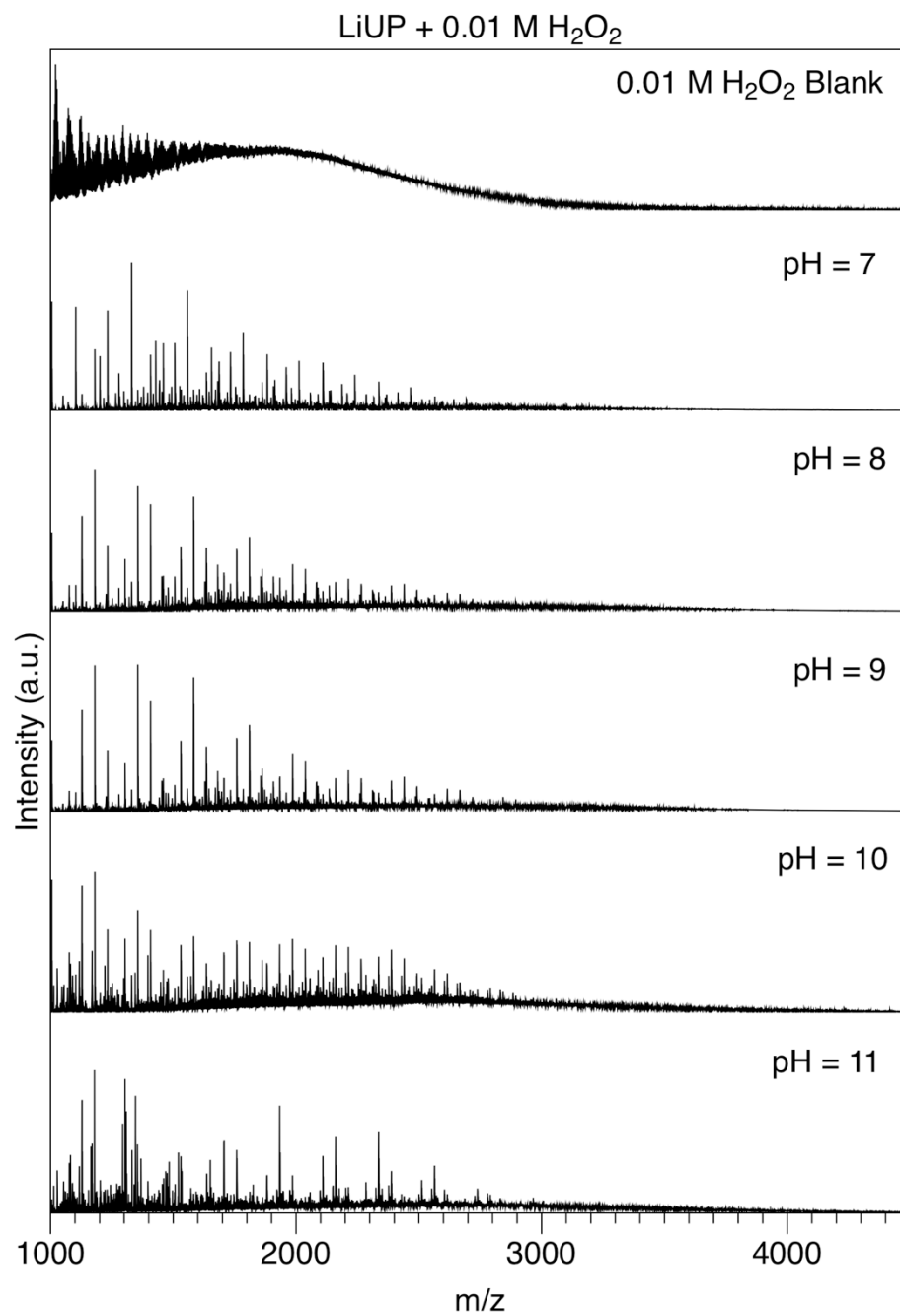


Figure S11. ESI-MS data from solutions resulting from mixing LiUP with 0.01 M H₂O₂ at pH 7 to 11.

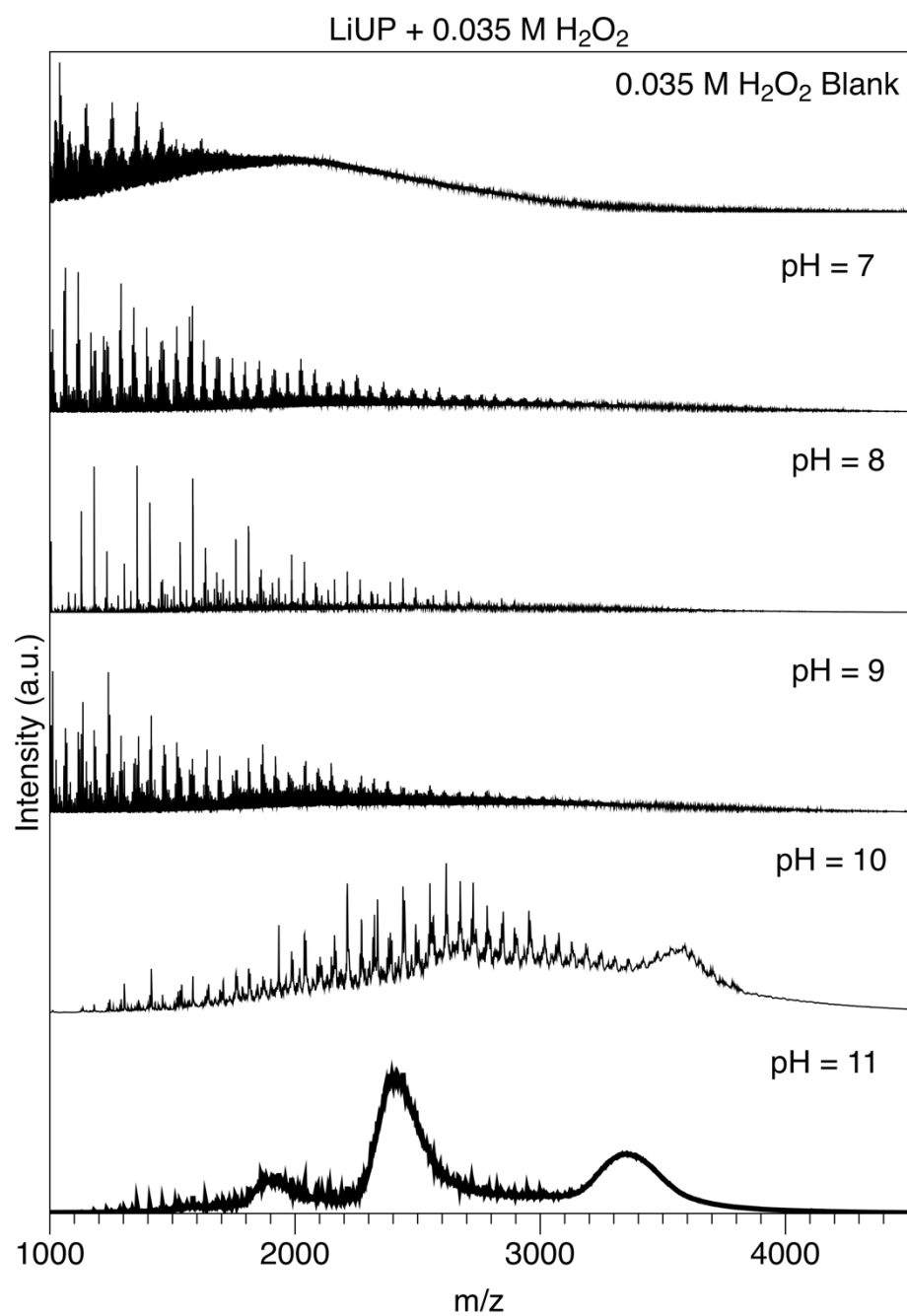


Figure S12. ESI-MS data from solutions resulting from mixing LiUP with 0.035 M H₂O₂ at pH 7 to 11.

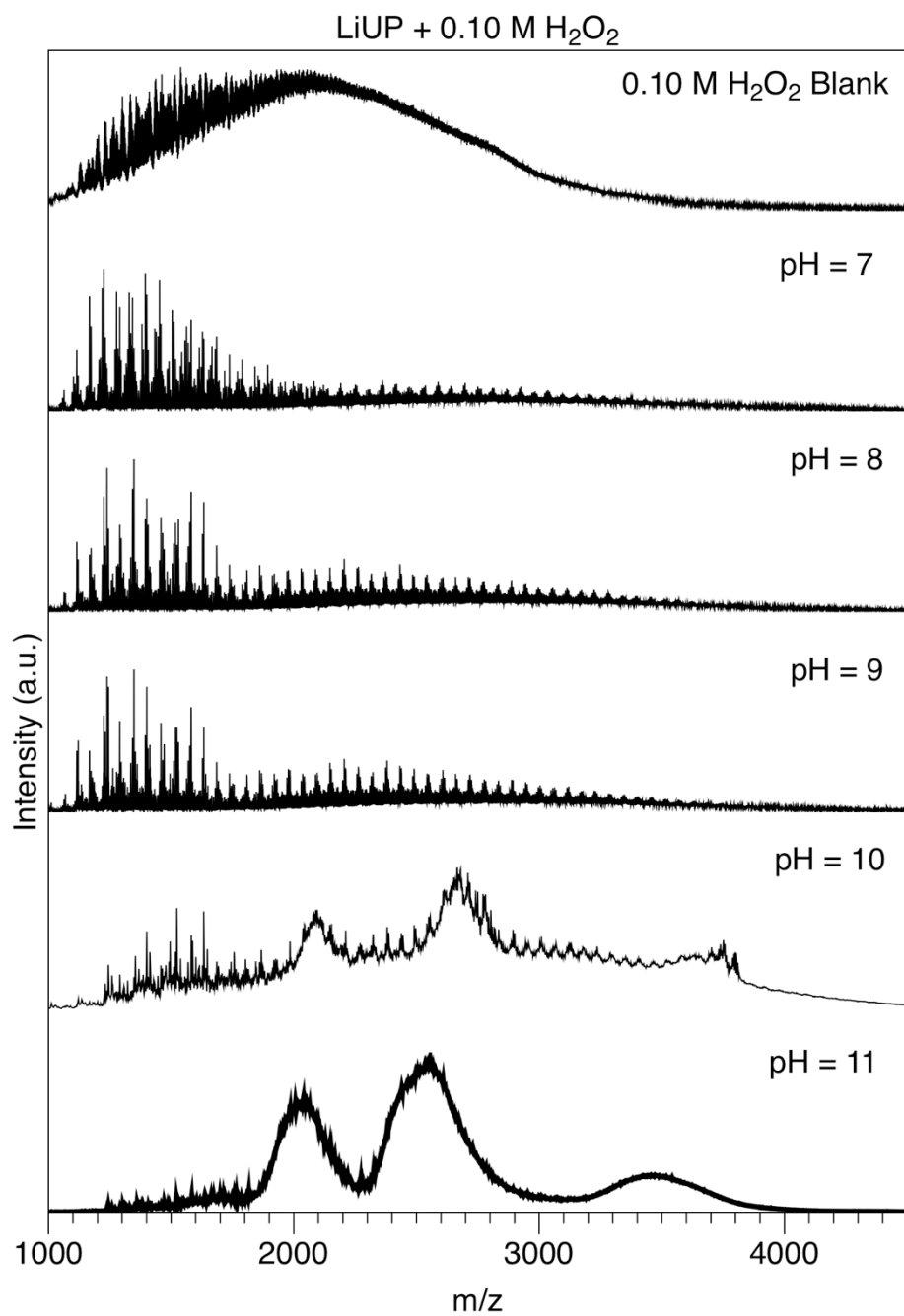


Figure S13. ESI-MS data from solutions resulting from mixing LiUP with 0.10 M H₂O₂ at pH 7 to 11.

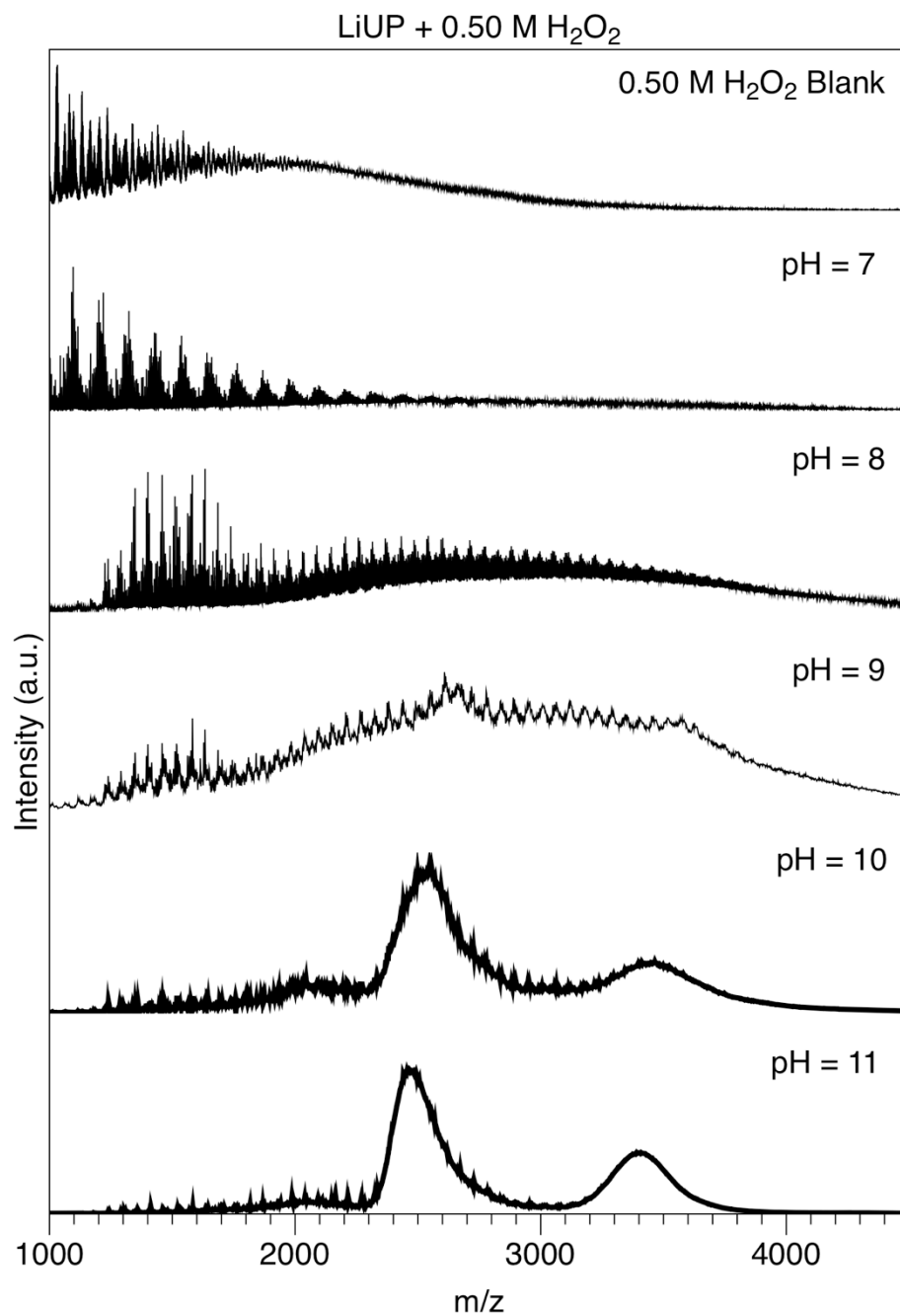


Figure S14. ESI-MS data from solutions resulting from mixing LiUP with 0.50 M H₂O₂ at pH 7 to 11.

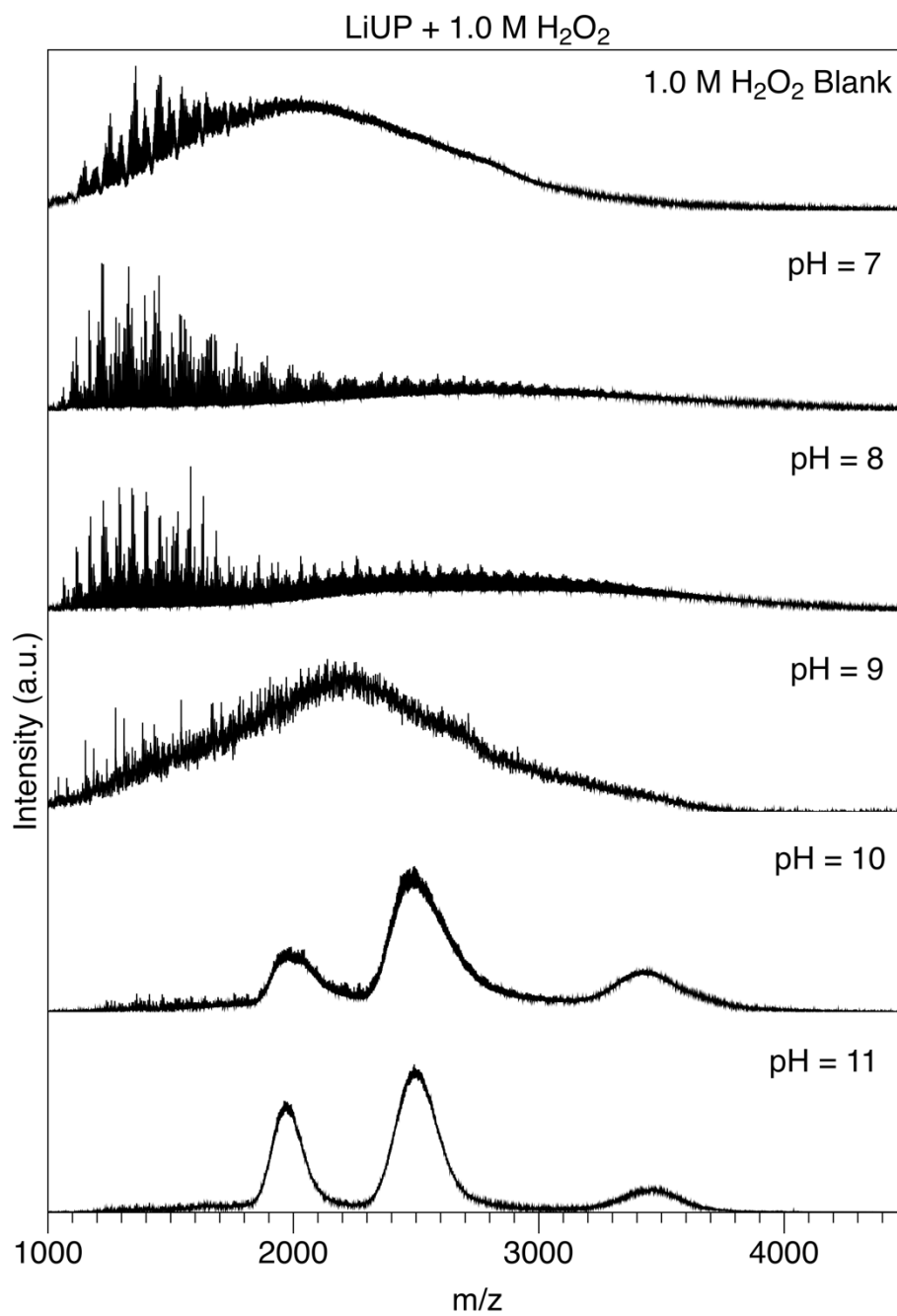


Figure S15. ESI-MS data from solutions resulting from mixing LiUP with 1.0 M H₂O₂ at pH 7 to 11.

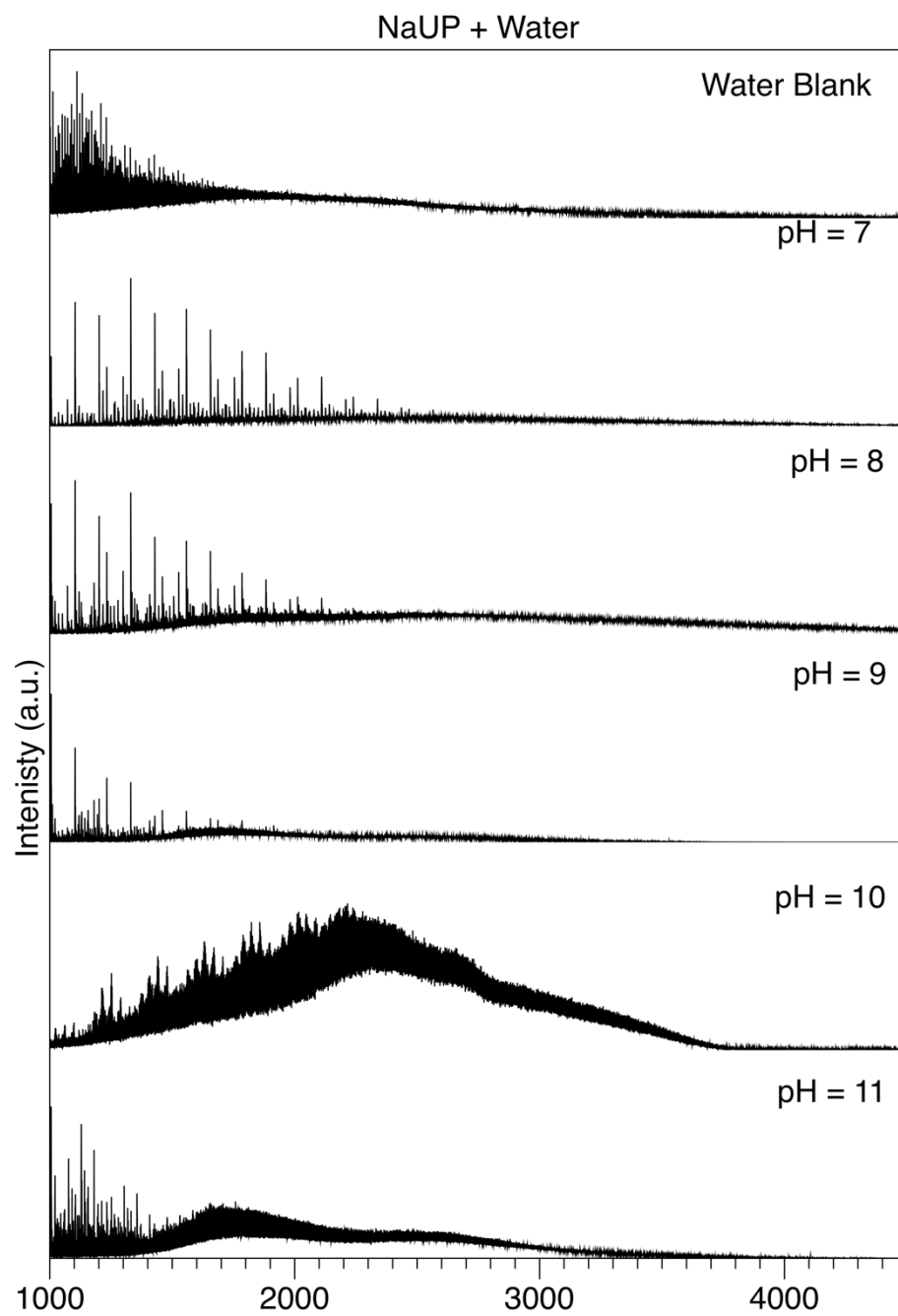


Figure S16. ESI-MS data from solutions resulting from mixing NaUP with water at pH 7 to 11

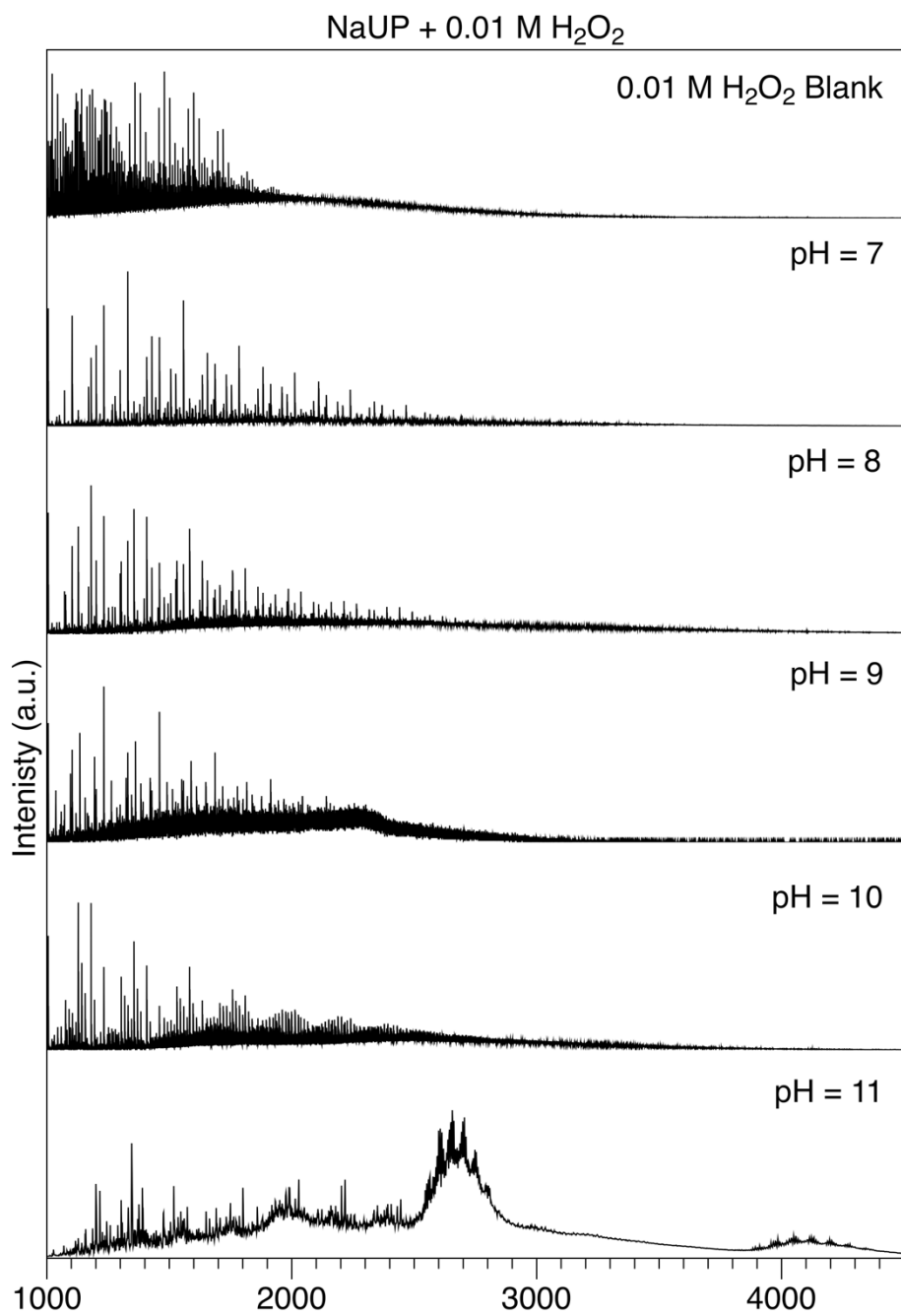


Figure S17. ESI-MS data from solutions resulting from mixing NaUP with 0.01 M H₂O₂ at pH 7 to 11.

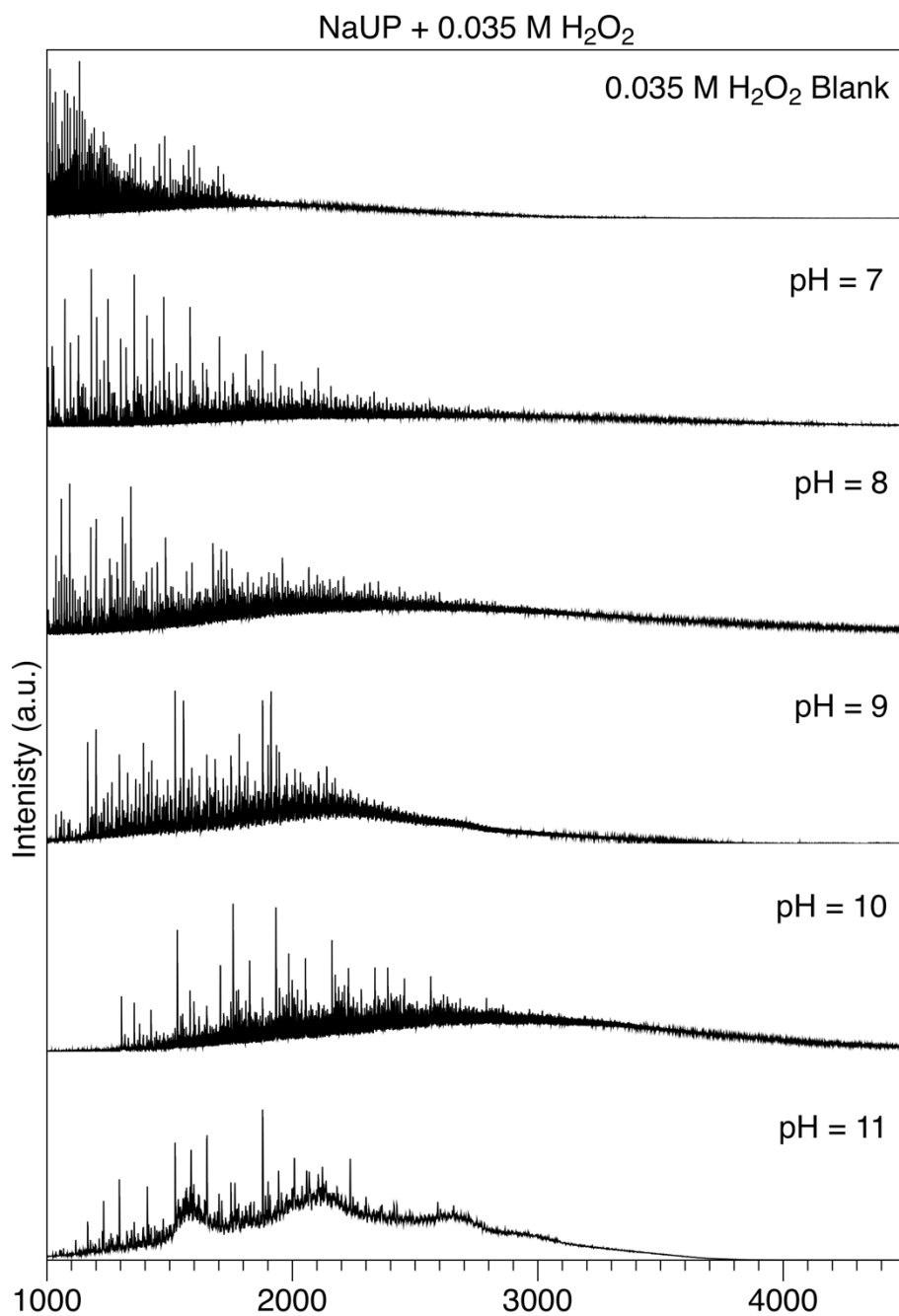


Figure S18. ESI-MS data from solutions resulting from mixing NaUP with 0.035 M H₂O₂ at pH 7 to 11.

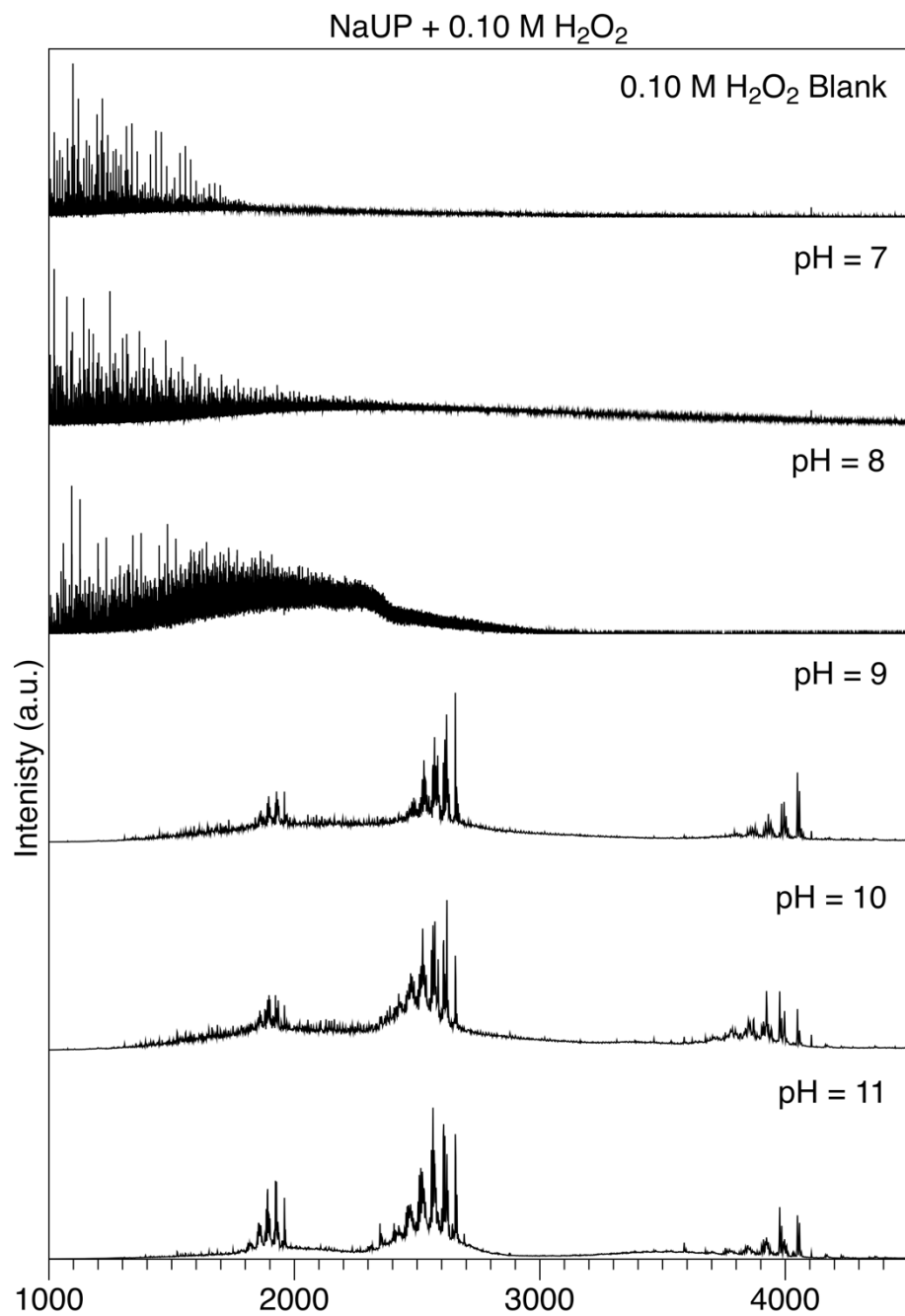


Figure S19. ESI-MS data from solutions resulting from mixing NaUP with 0.10 M H₂O₂ at pH 7 to 11.

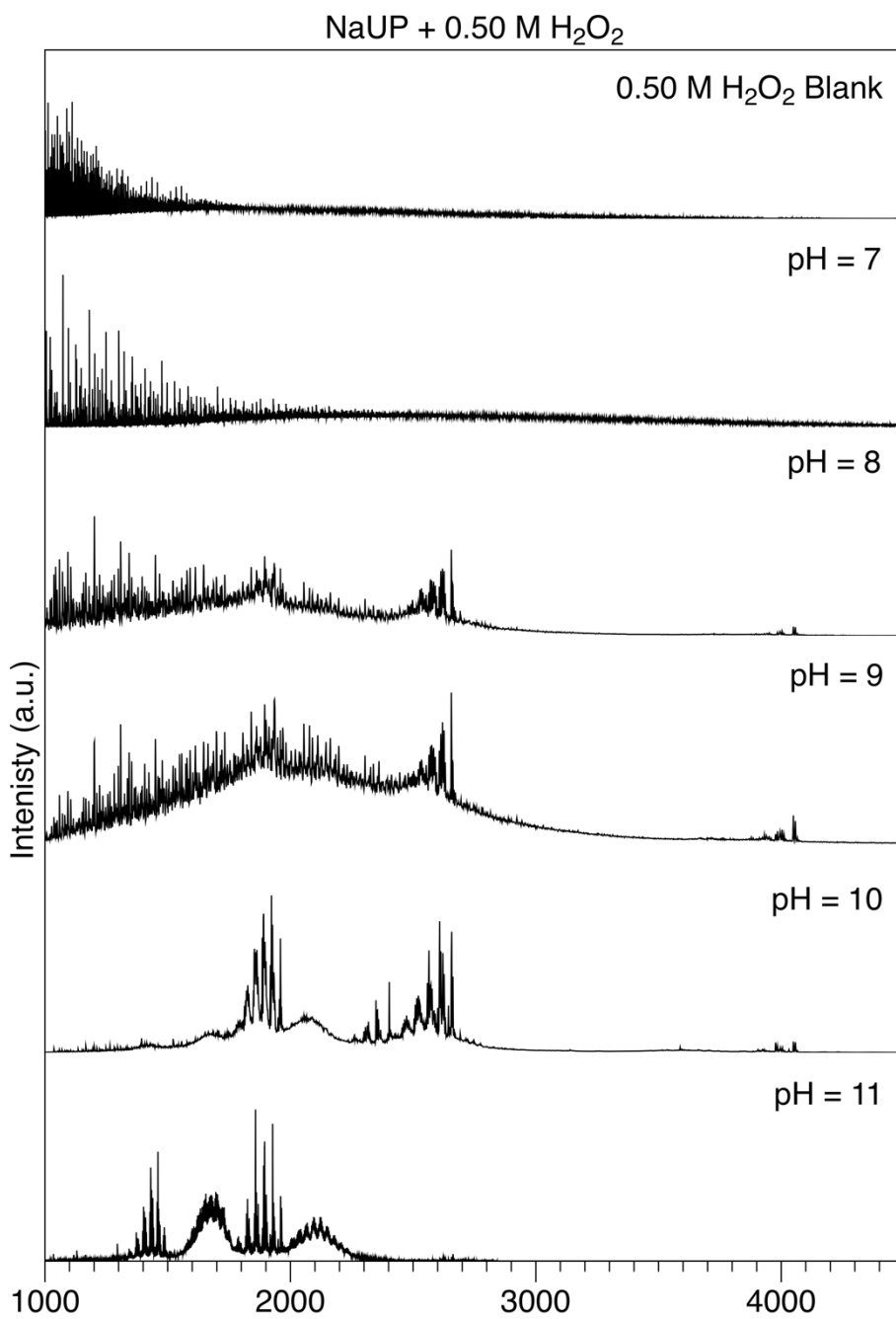


Figure S20. ESI-MS data from solutions resulting from mixing NaUP with 0.50 M H₂O₂ at pH 7 to 11.

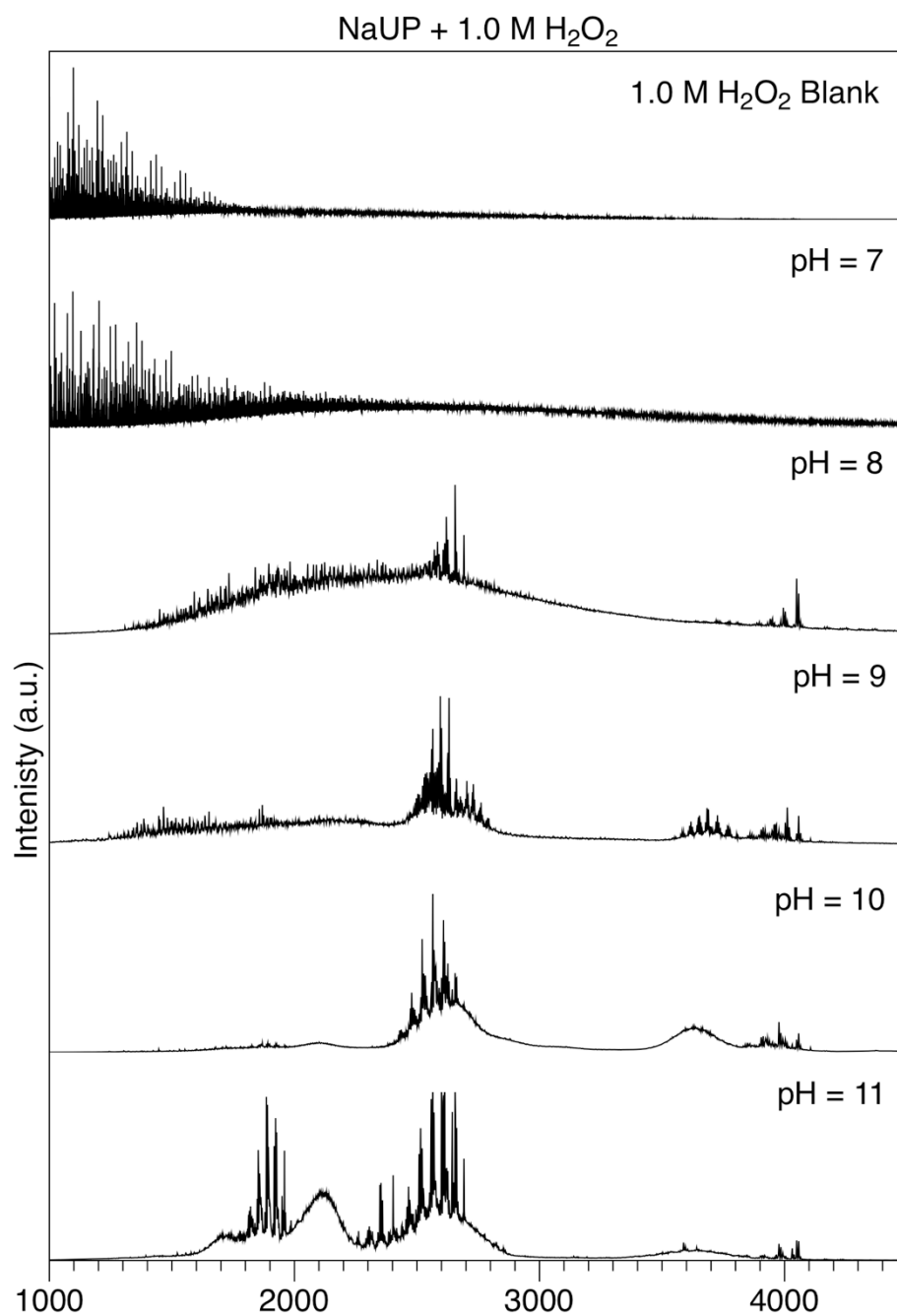


Figure S21. ESI-MS data from solutions resulting from mixing NaUP with 1.0 M H₂O₂ at pH 7 to 11.

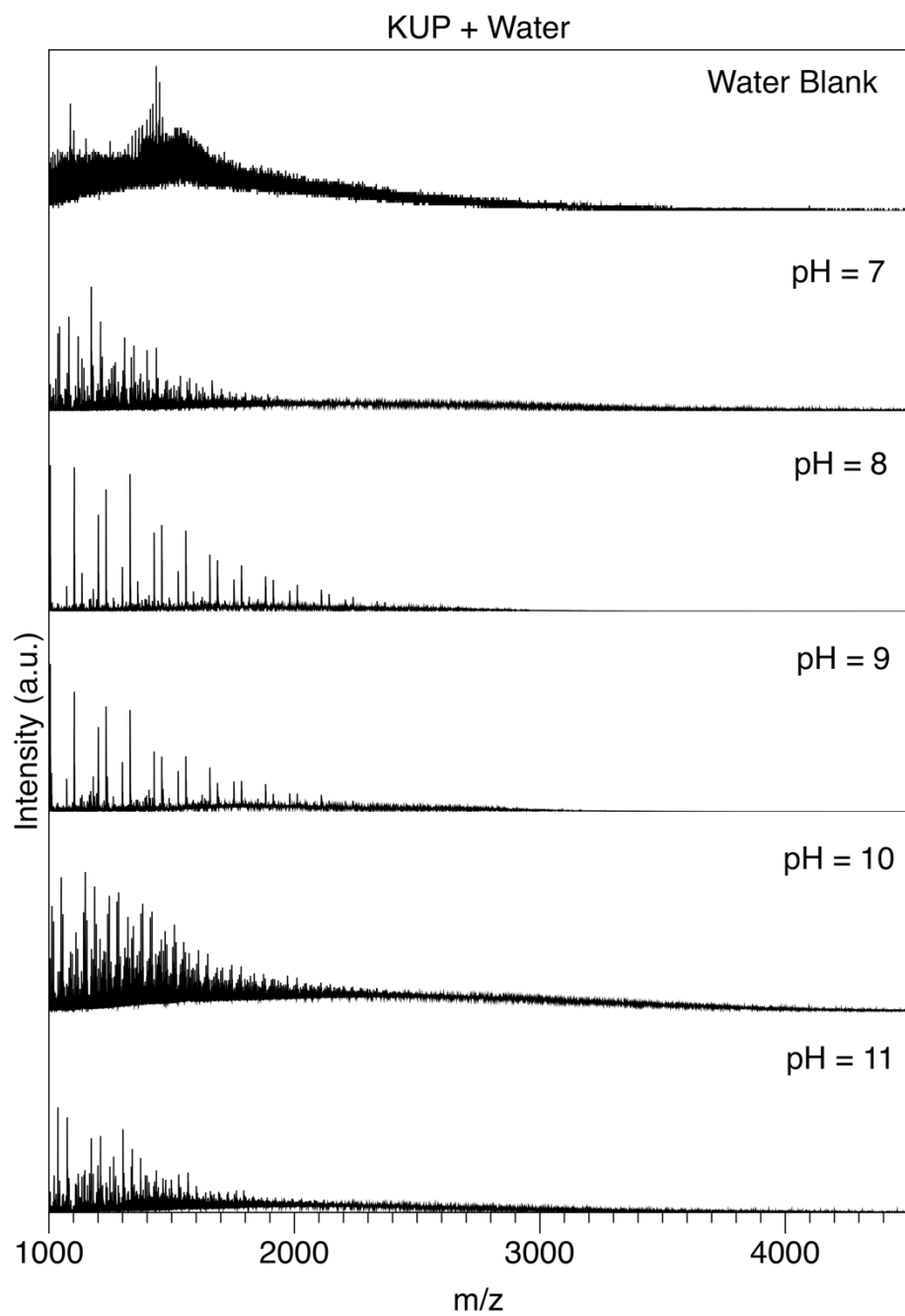


Figure S22. ESI-MS data from solutions resulting from mixing KUP with water at pH 7 to 11.

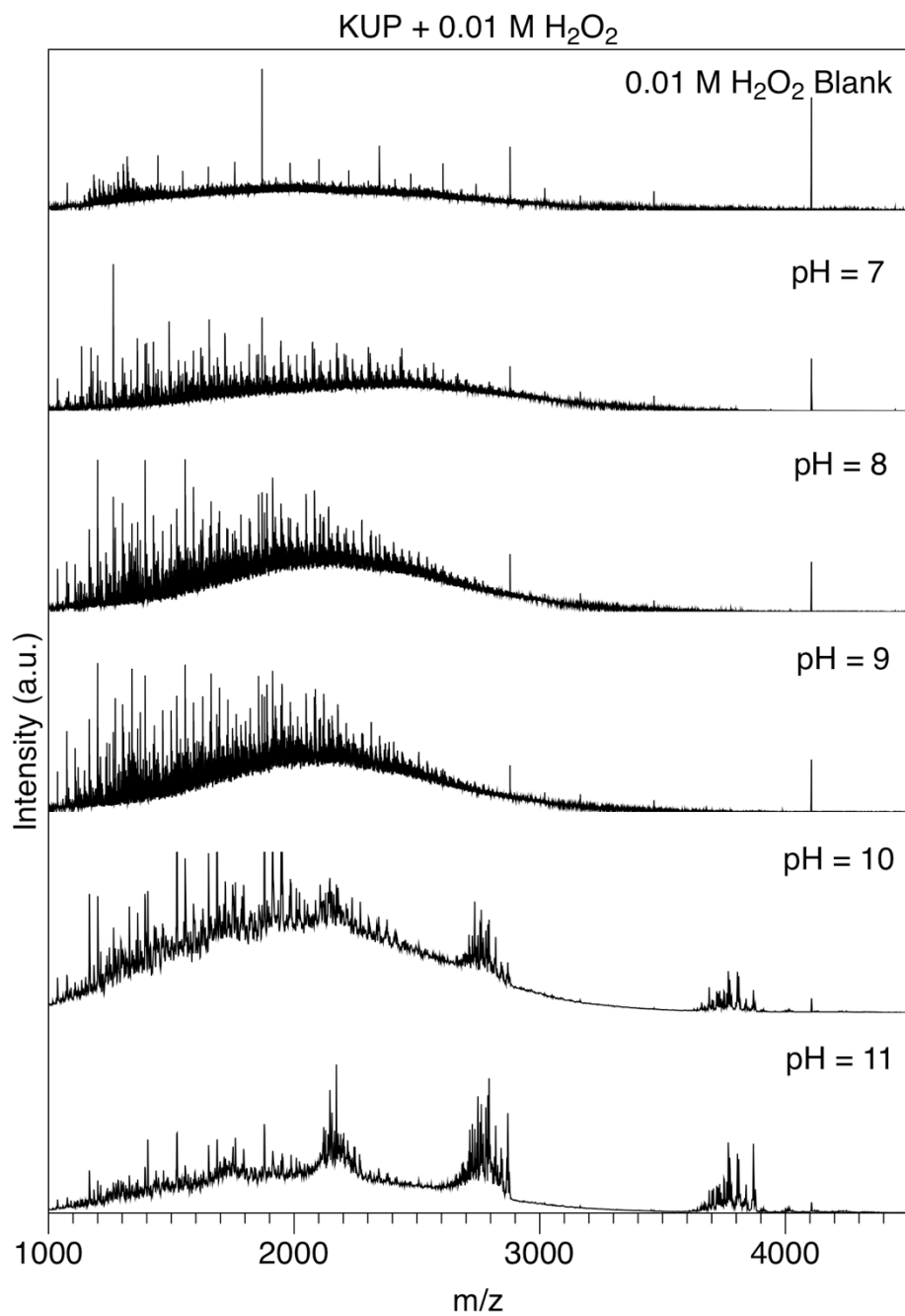


Figure S23. ESI-MS data from solutions resulting from mixing KUP with 0.01 M H₂O₂ at pH 7 to 11.

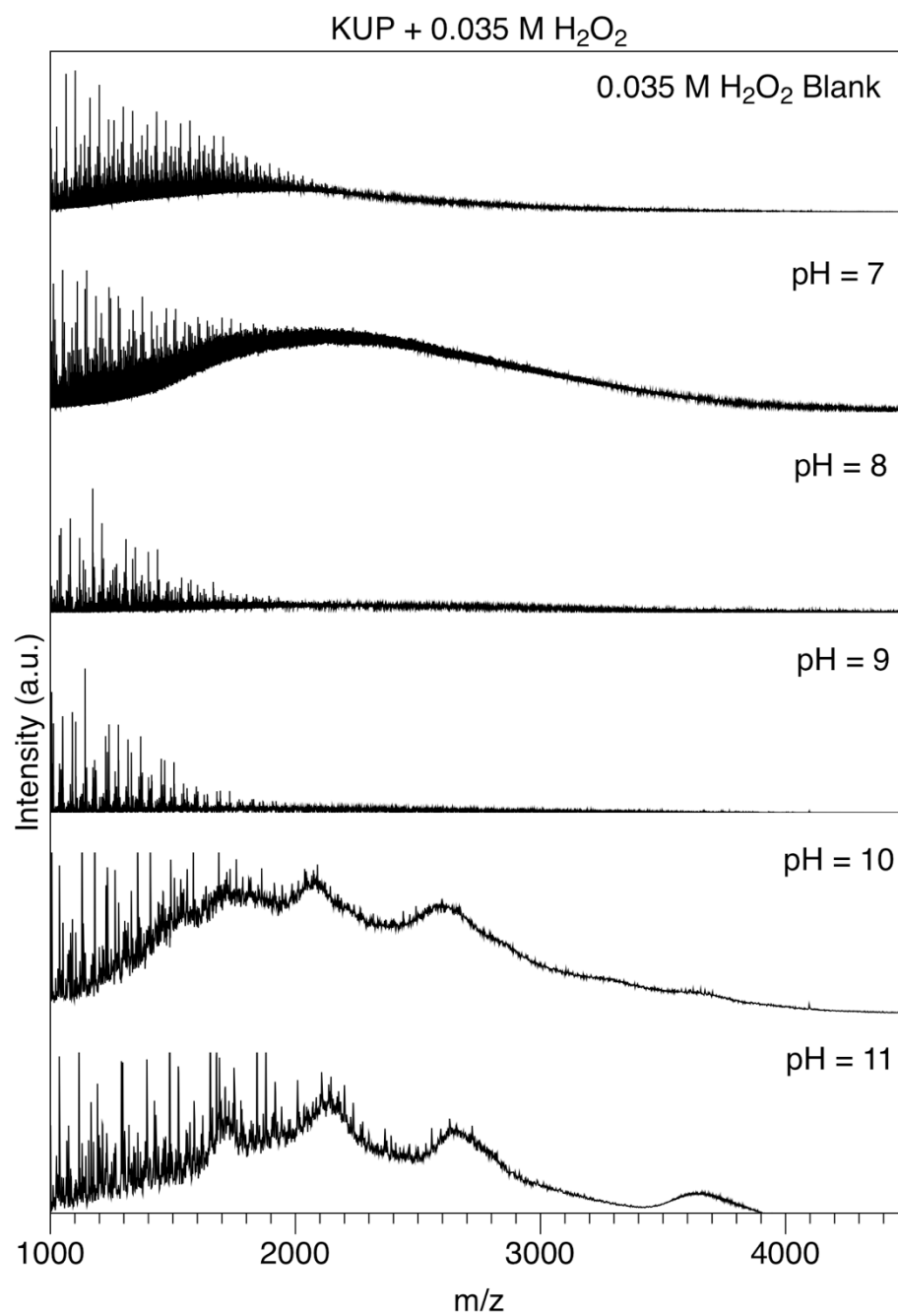


Figure S24. ESI-MS data from solutions resulting from mixing KUP with 0.035 M H₂O₂ at pH 7 to 11.

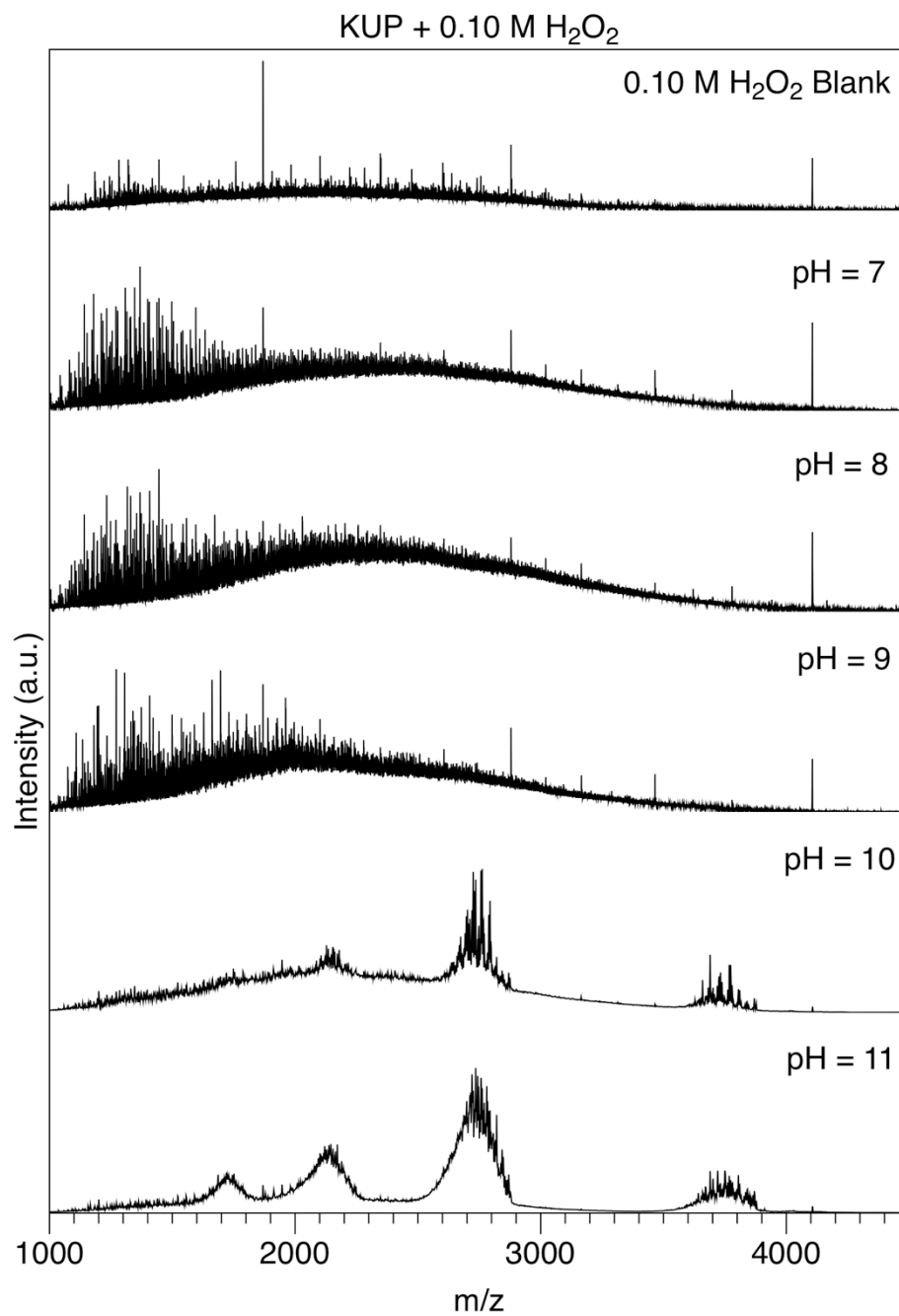


Figure S25. ESI-MS data from solutions resulting from mixing KUP with 0.10 M H₂O₂ at pH 7 to 11.

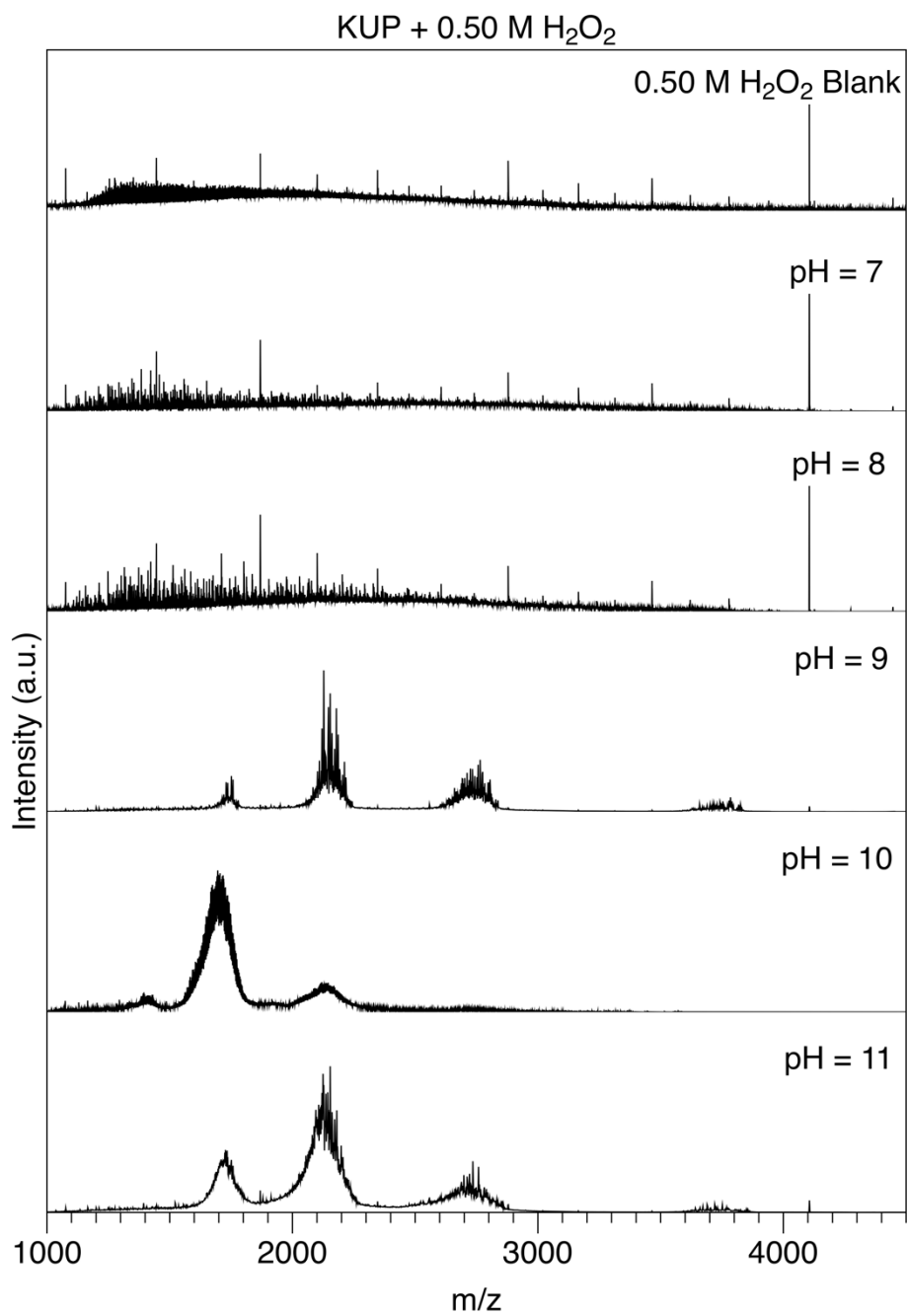


Figure S26. ESI-MS data from solutions resulting from mixing KUP with 0.50 M H₂O₂ at pH 7 to 11.

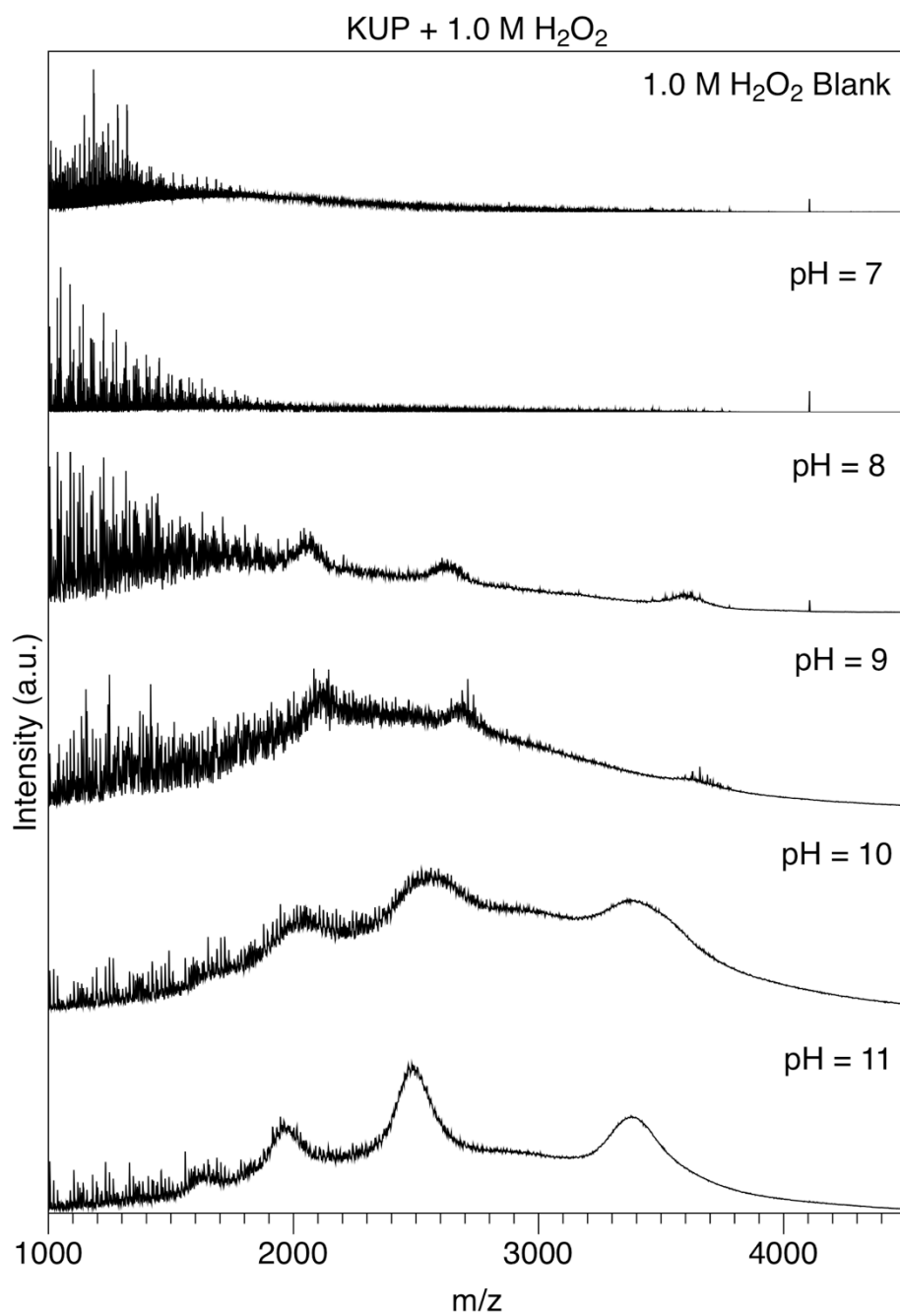


Figure S27. ESI-MS data from solutions resulting from mixing KUP with 1.0 M H₂O₂ at pH 7 to 11.

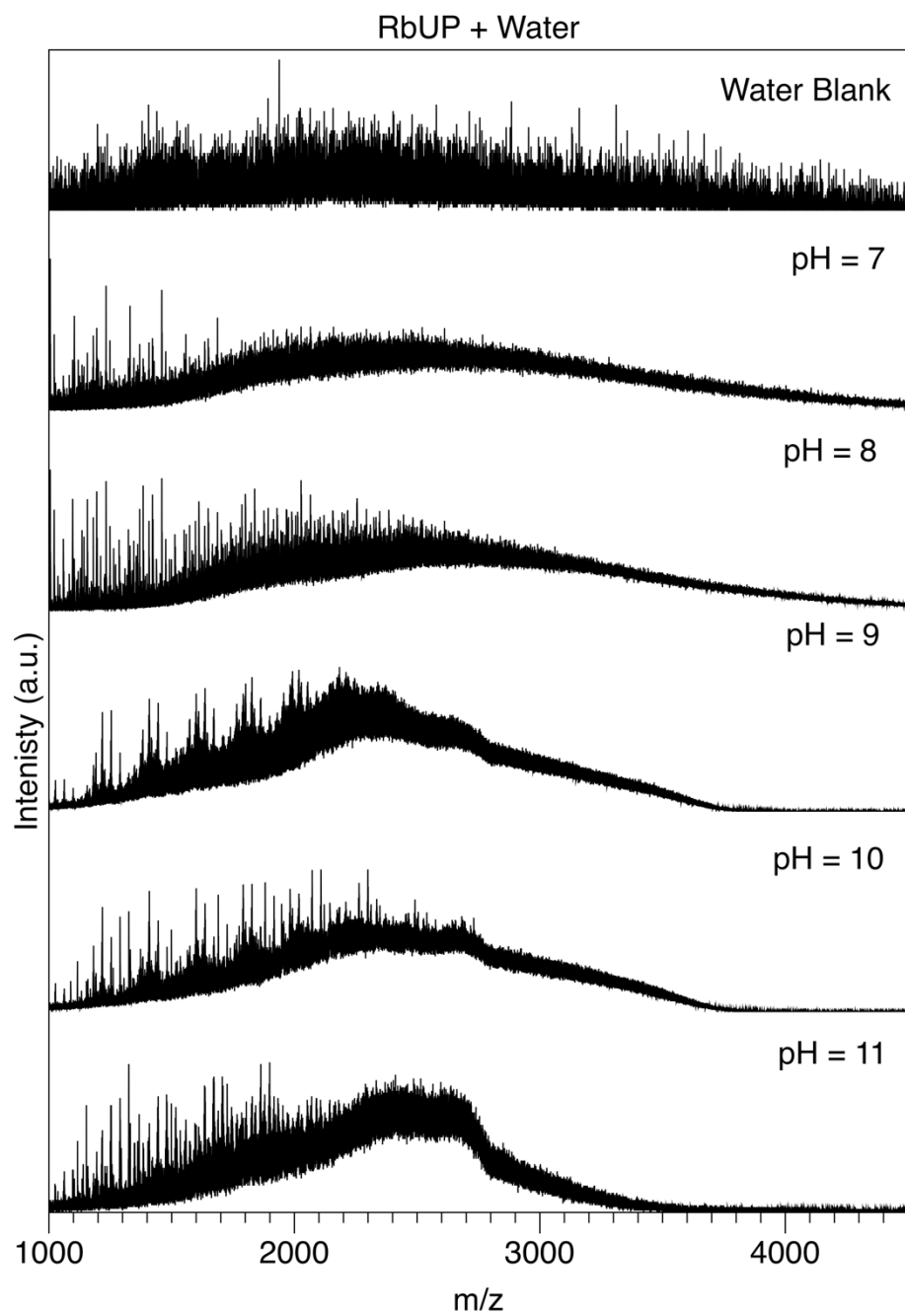


Figure S28. ESI-MS data from solutions resulting from mixing RbUP with water at pH 7 to 11.

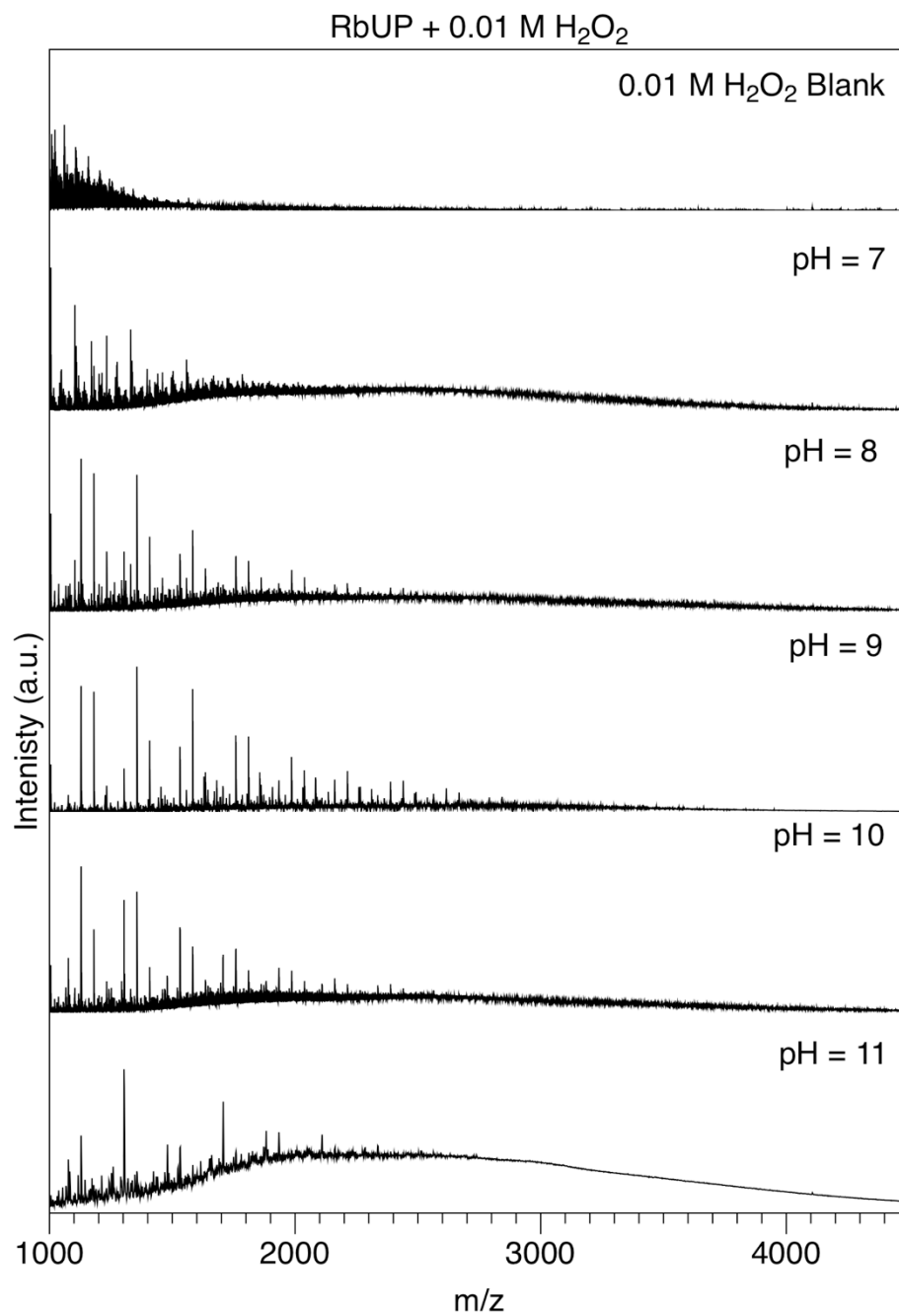


Figure S29. ESI-MS data from solutions resulting from mixing RbUP with 0.01 M H₂O₂ at pH 7 to 11.

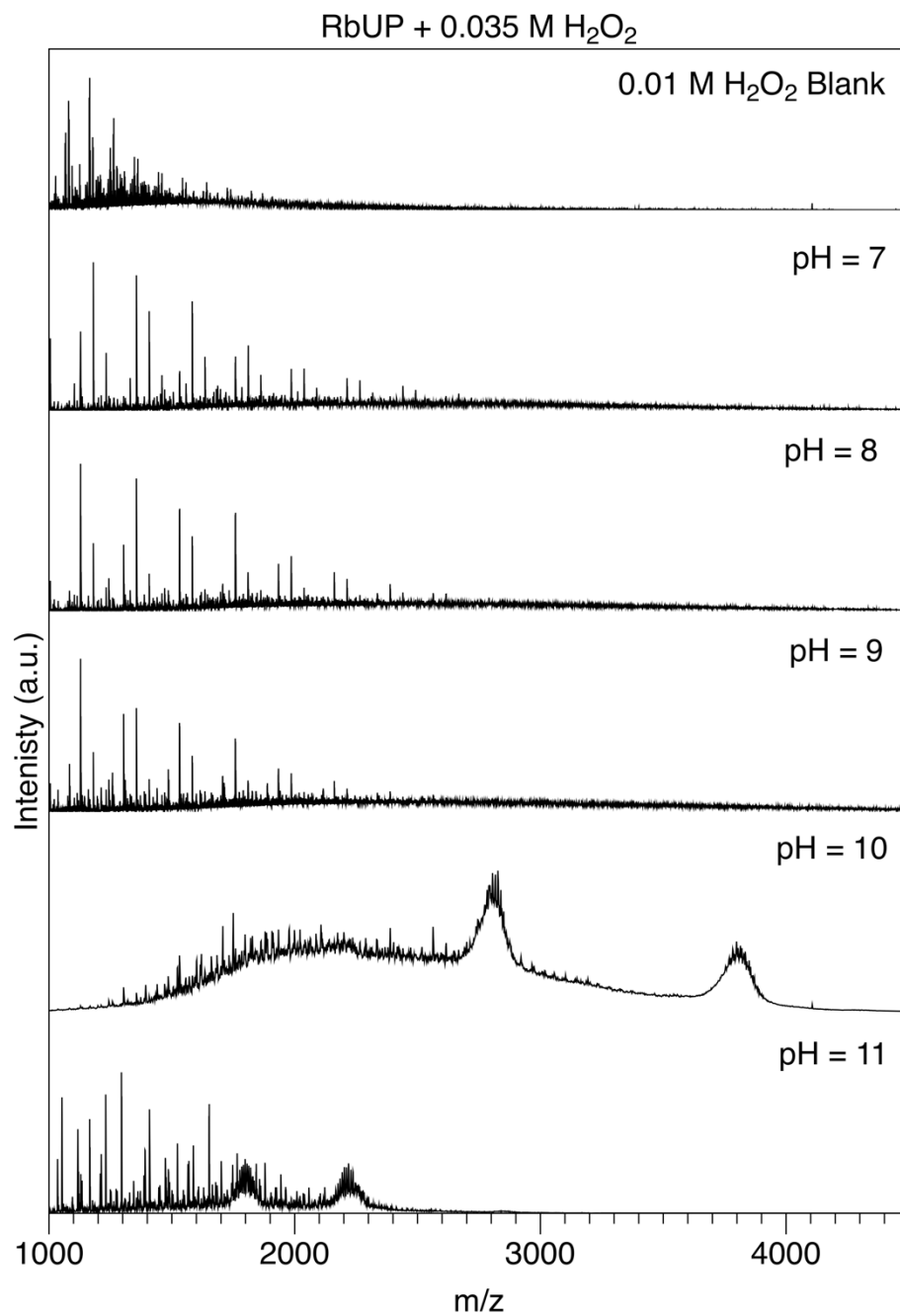


Figure S30. ESI-MS data from solutions resulting from mixing RbUP with 0.035 M H₂O₂ at pH 7 to 11.

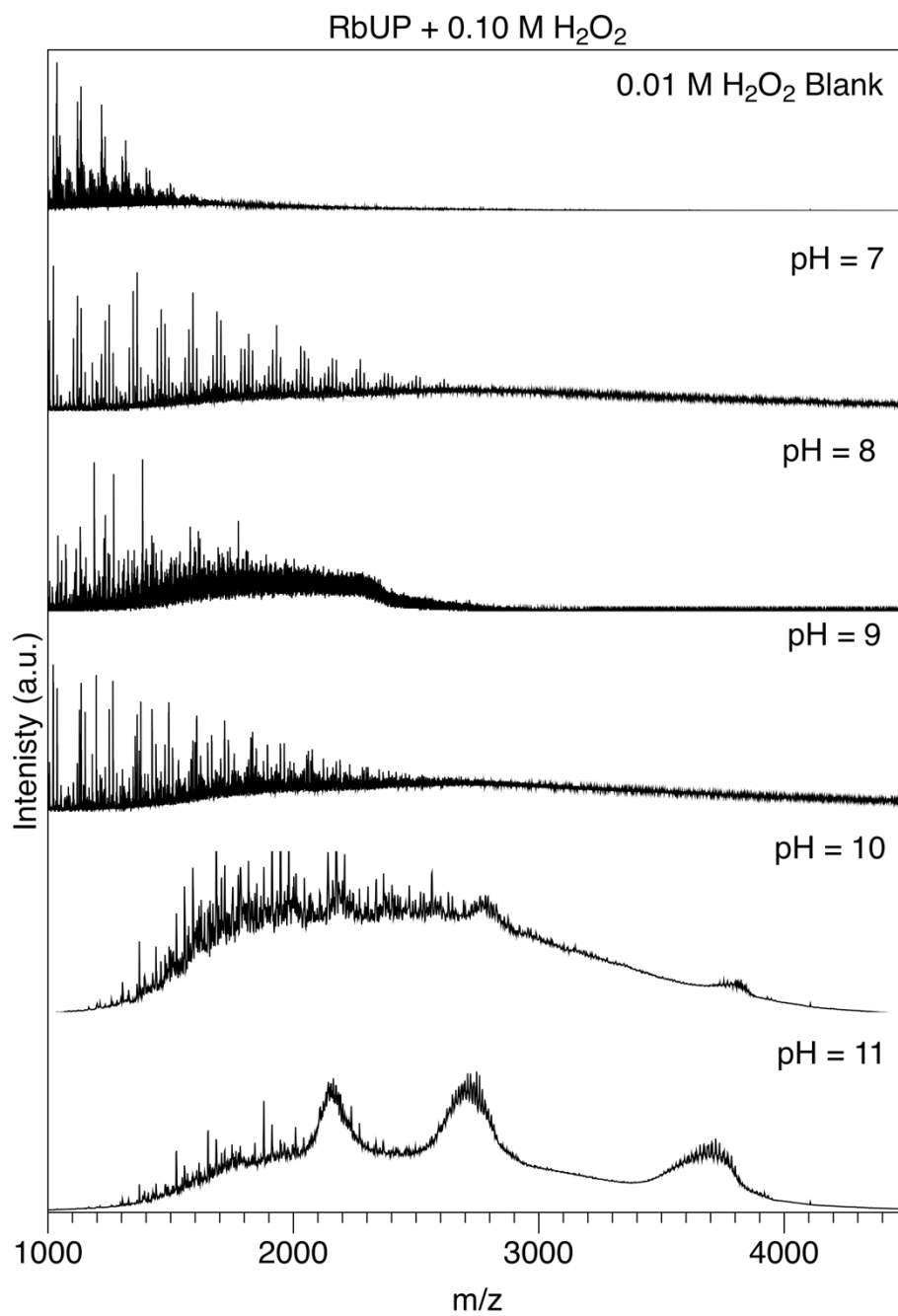


Figure S31. ESI-MS data from solutions resulting from mixing RbUP with 0.10 M H₂O₂ at pH 7 to 11.

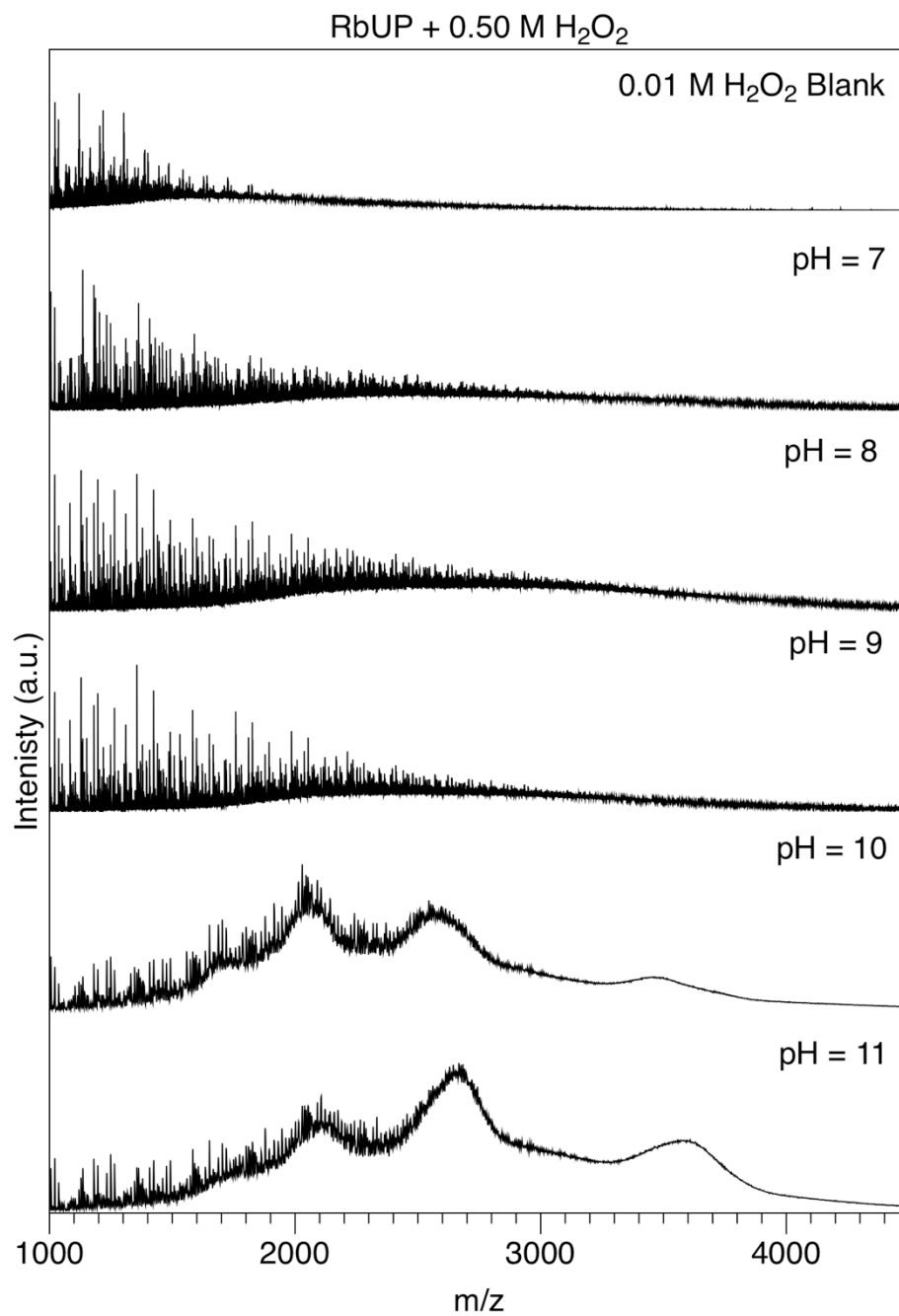


Figure S32. ESI-MS data from solutions resulting from mixing RbUP with 0.50 M H₂O₂ at pH 7 to 11.

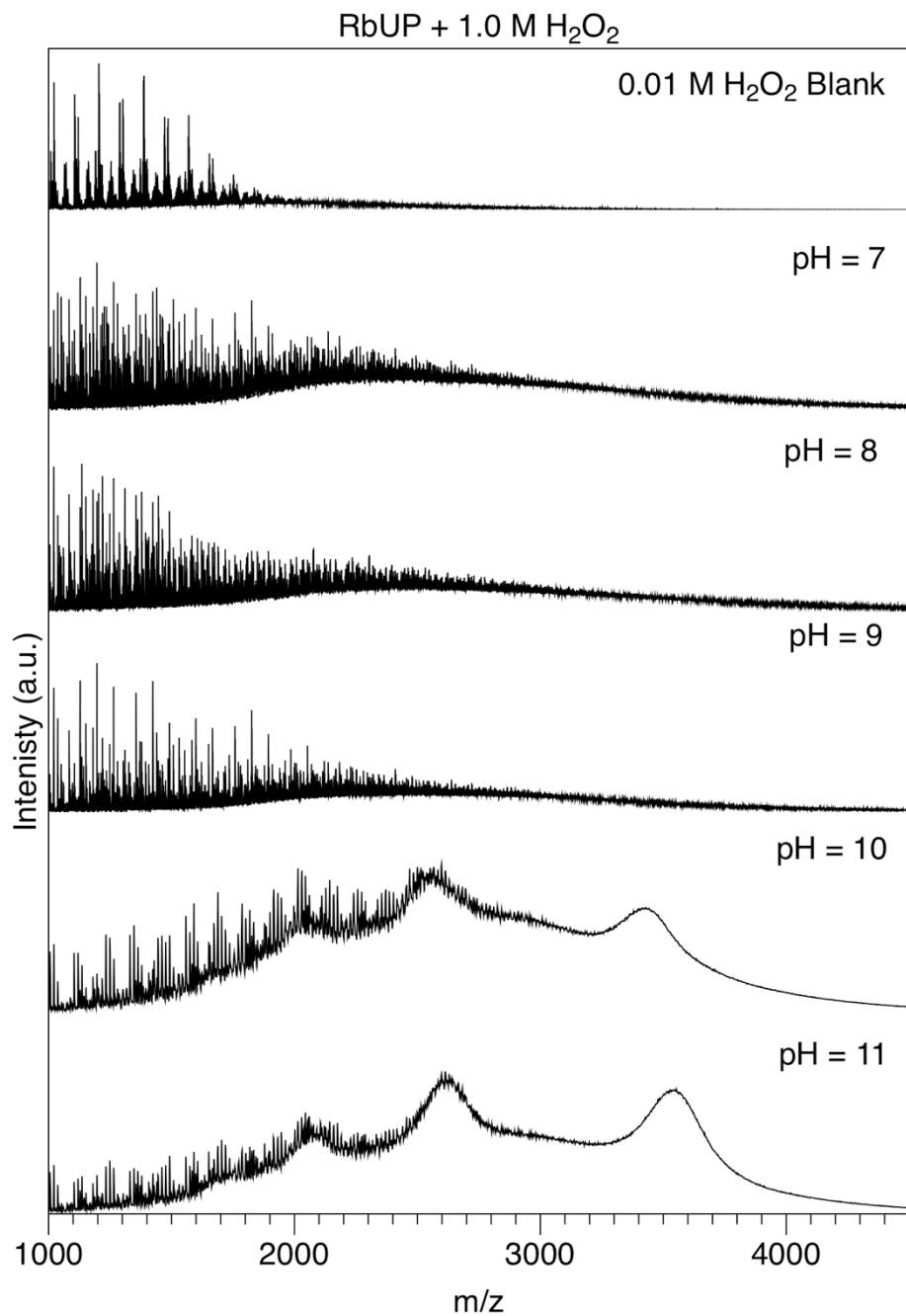


Figure S33. ESI-MS data from solutions resulting from mixing RbUP with 1.0 M H₂O₂ at pH 7 to 11.

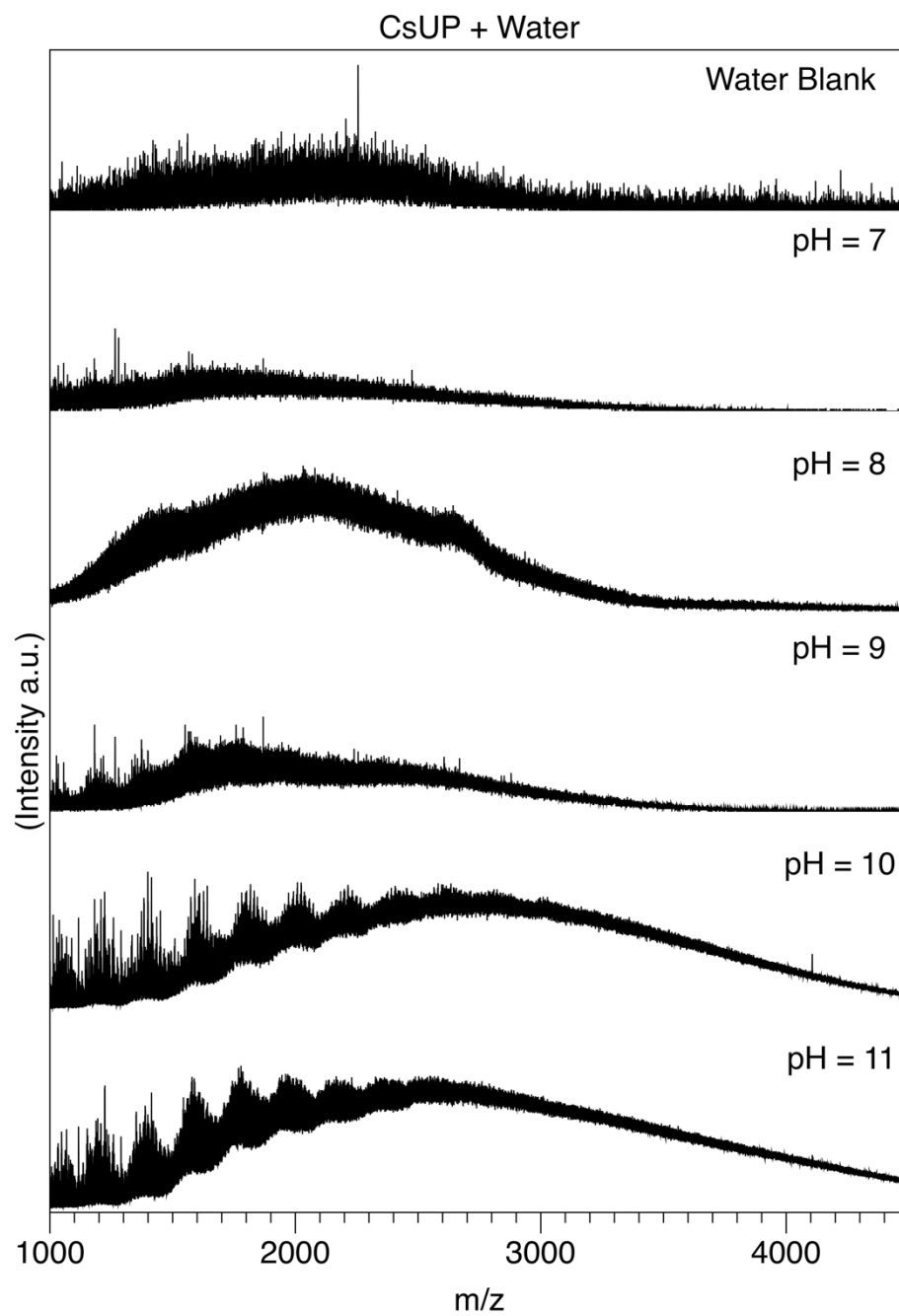


Figure S34. ESI-MS data from solutions resulting from mixing CsUP with water at pH 7 to 11

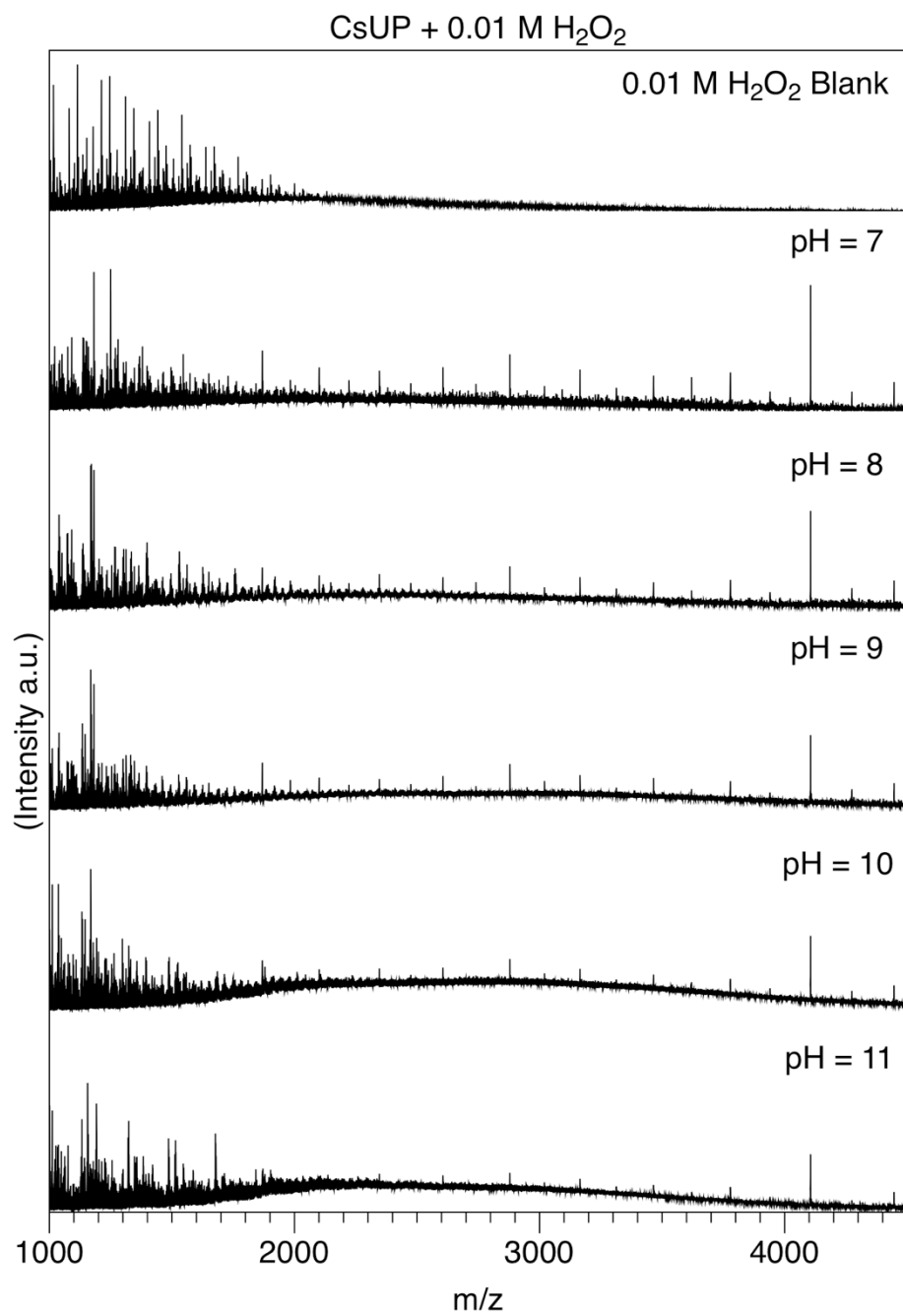


Figure S35. ESI-MS data from solutions resulting from mixing CsUP with 0.01 M H₂O₂ at pH 7 to 11.

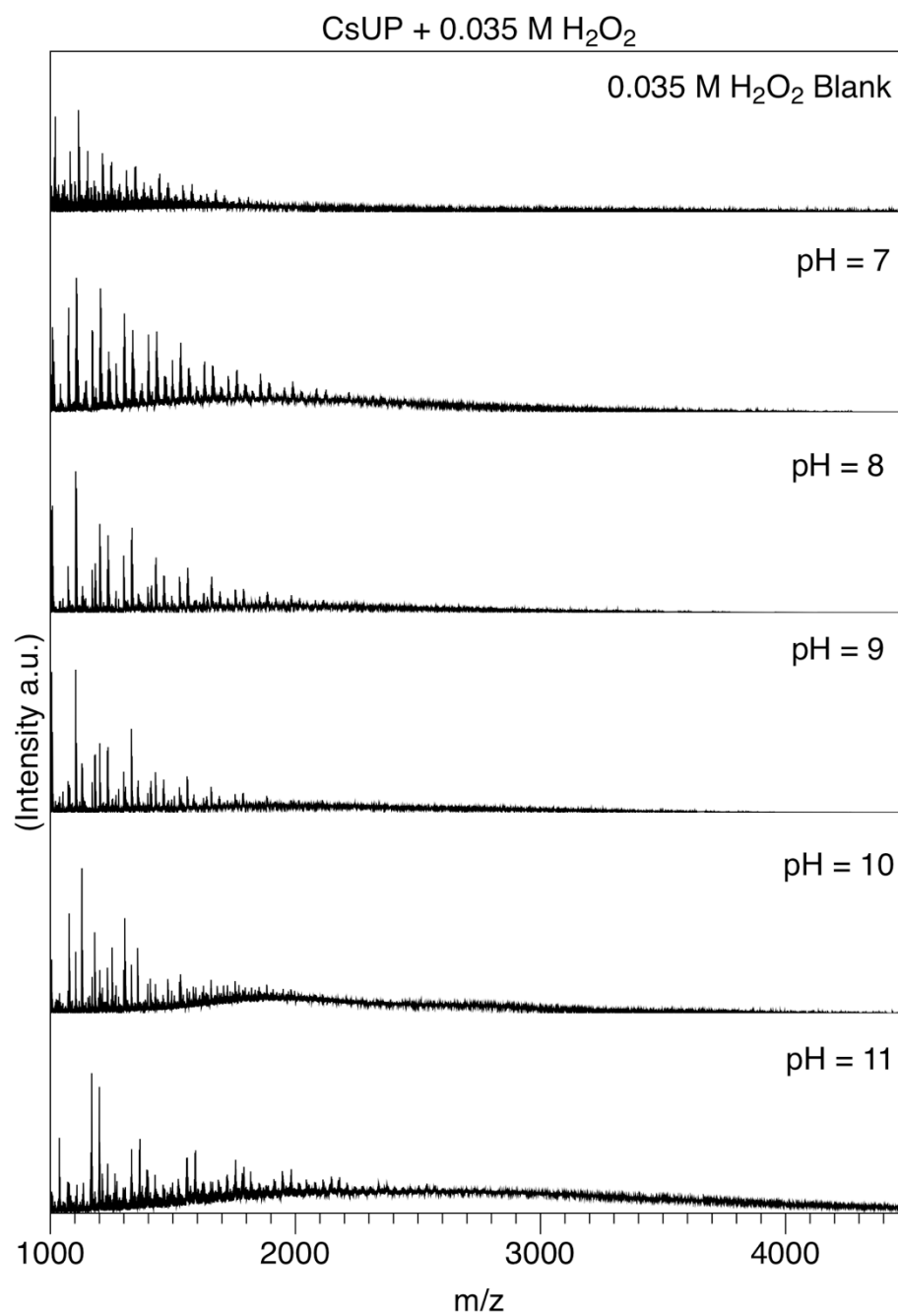


Figure S36. ESI-MS data from solutions resulting from mixing CsUP with 0.035 M H₂O₂ at pH 7 to 11.

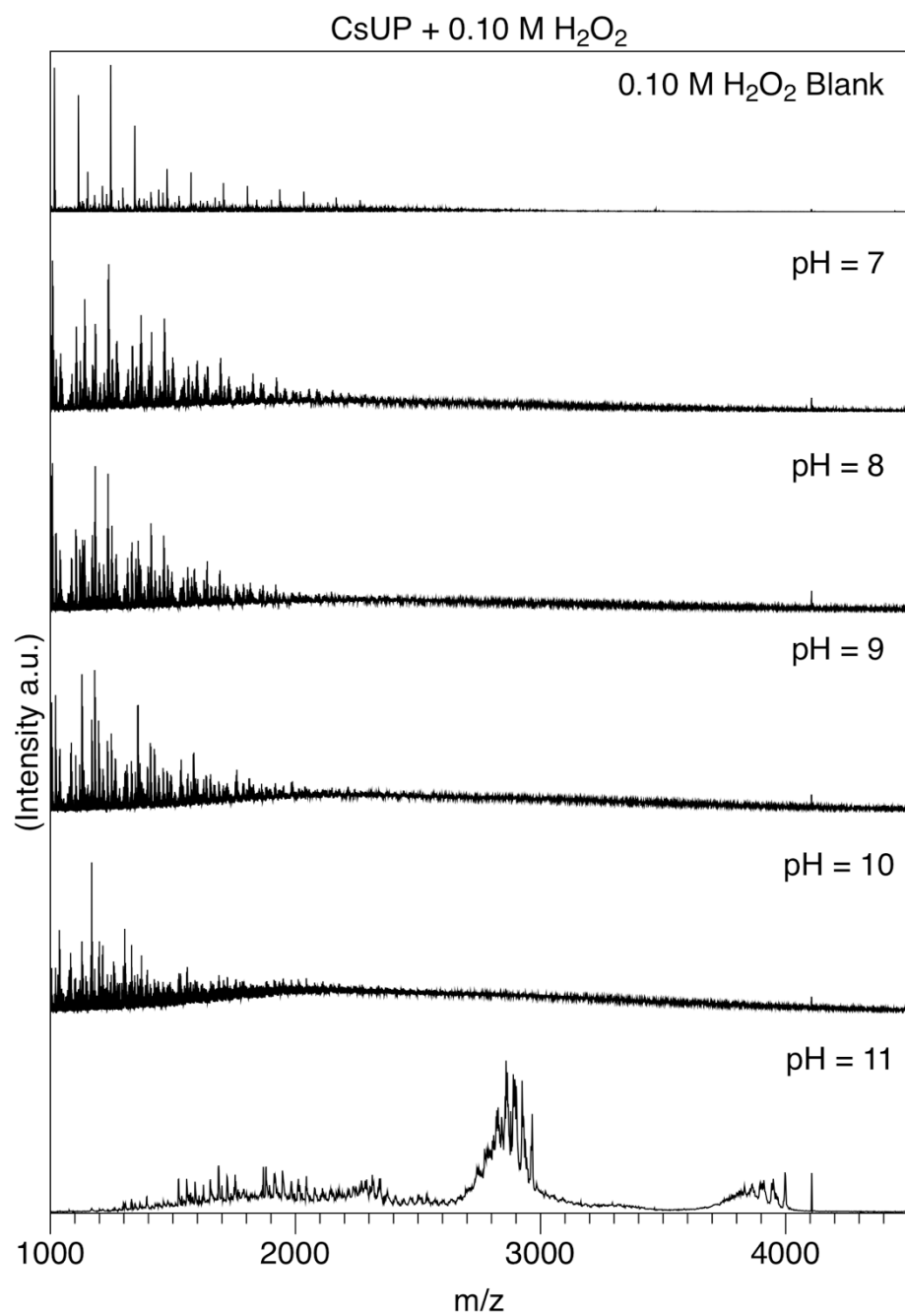


Figure S37. ESI-MS data from solutions resulting from mixing CsUP with 0.10 M H₂O₂ at pH 7 to 11.

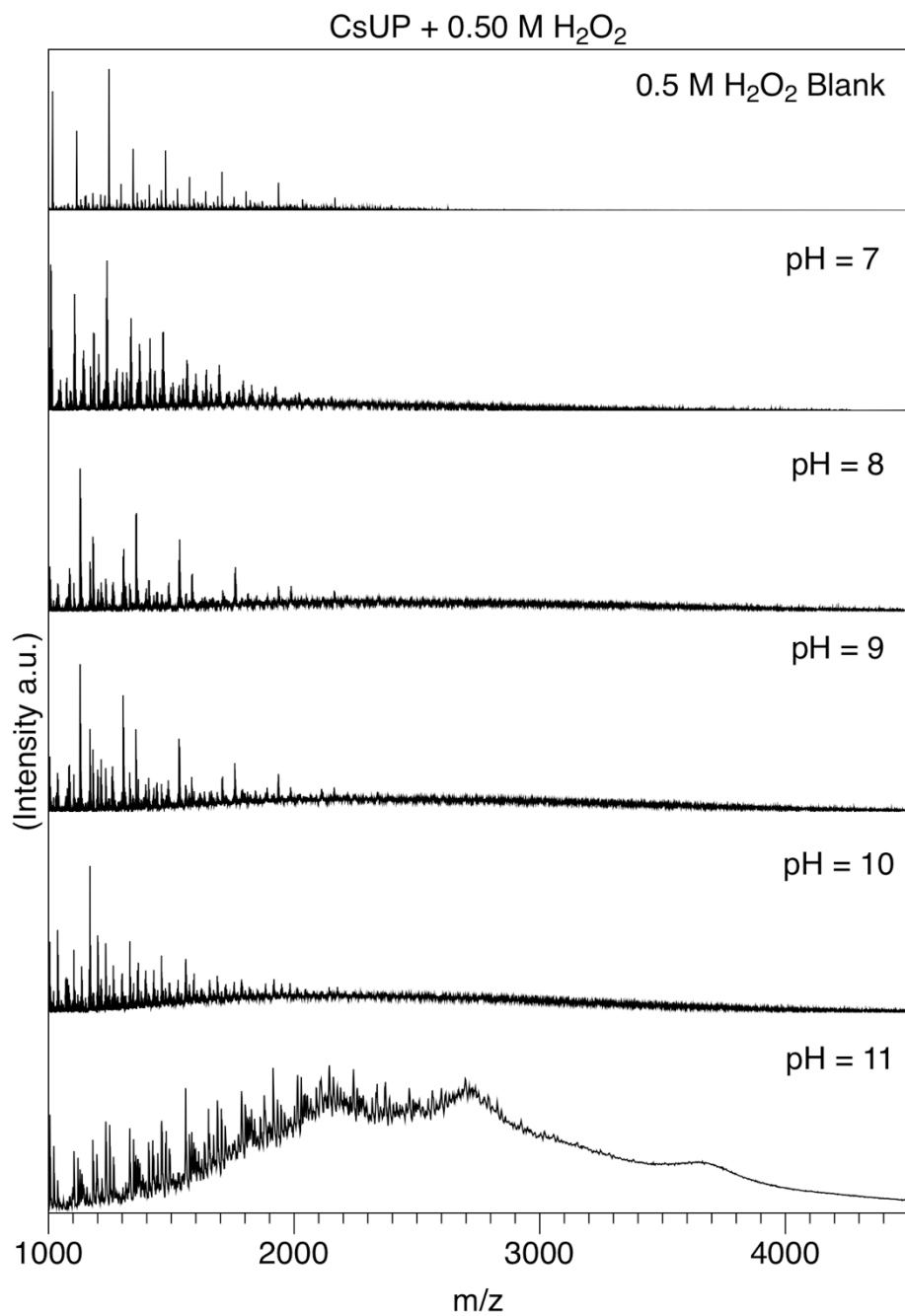


Figure S38. ESI-MS data from solutions resulting from mixing CsUP with 0.50 M H₂O₂ at pH 7 to 11.

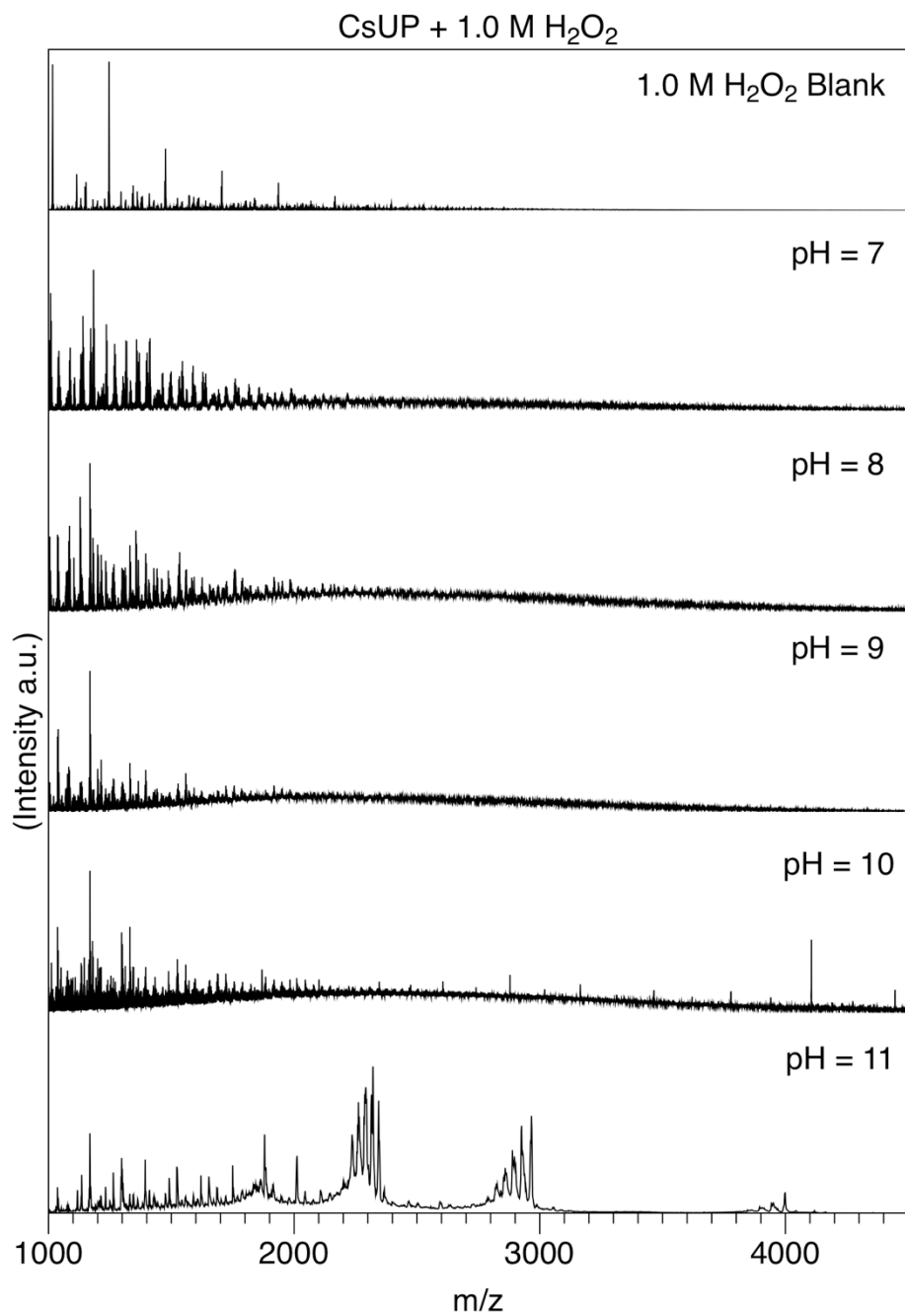


Figure S39. ESI-MS data from solutions resulting from mixing CsUP with 1.0 M H₂O₂ at pH 7 to 11.

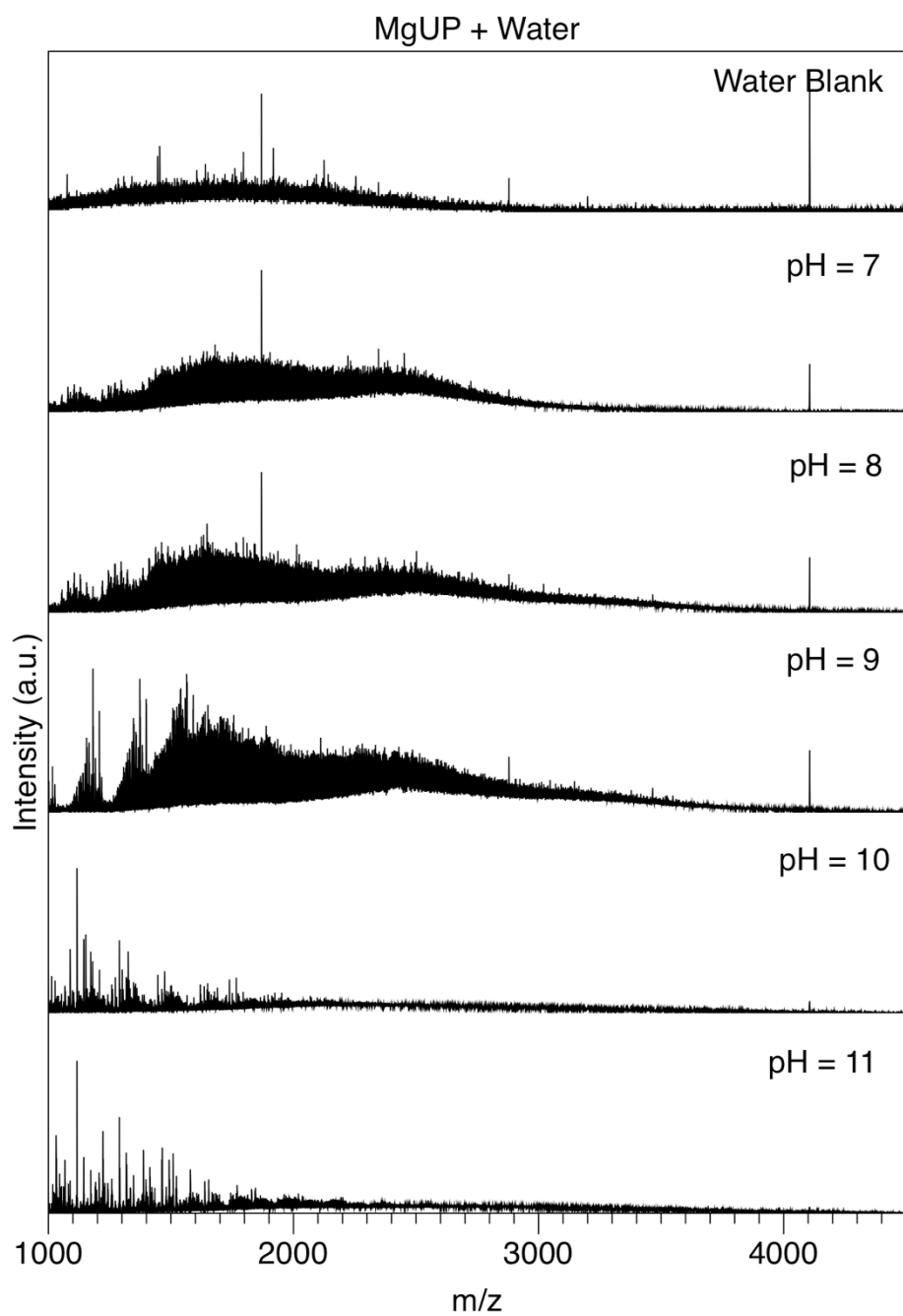


Figure S40. ESI-MS data from solutions resulting from mixing MgUP with water at pH 7 to 11.

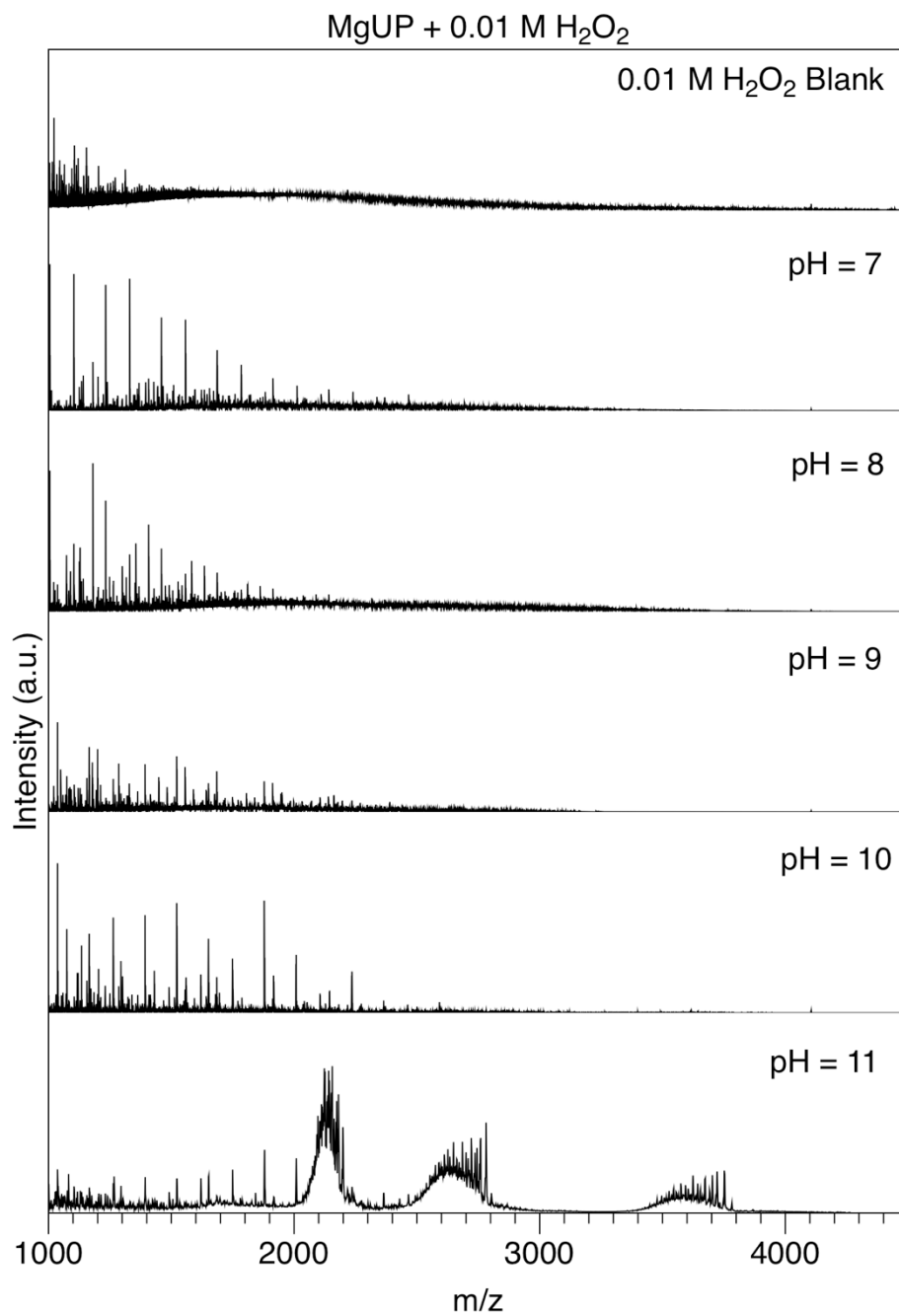


Figure S41. ESI-MS data from solutions resulting from mixing MgUP with 0.01 M H₂O₂ at pH 7 to 11.

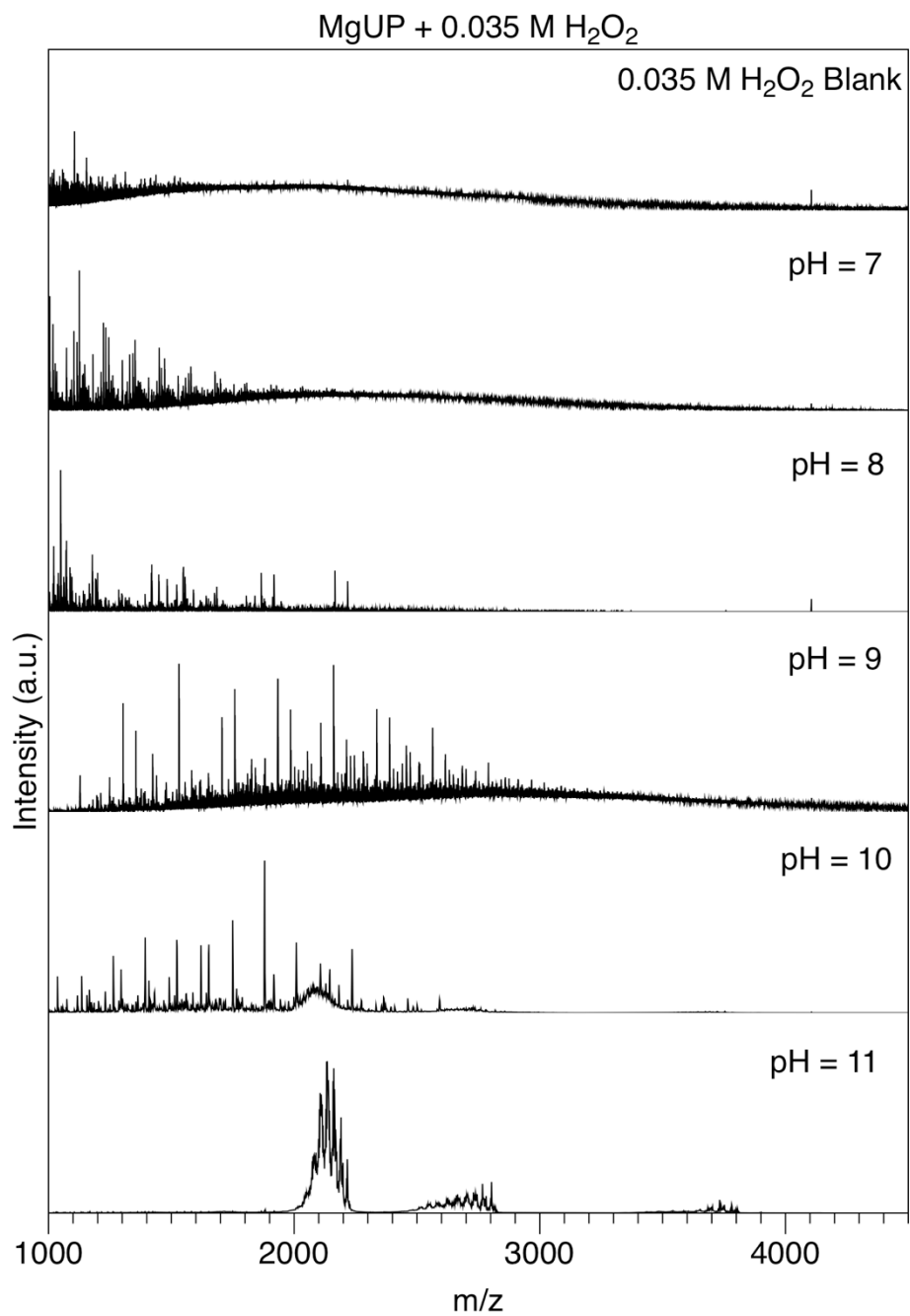


Figure S42. ESI-MS data from solutions resulting from mixing MgUP with 0.035 M H₂O₂ at pH 7 to 11.

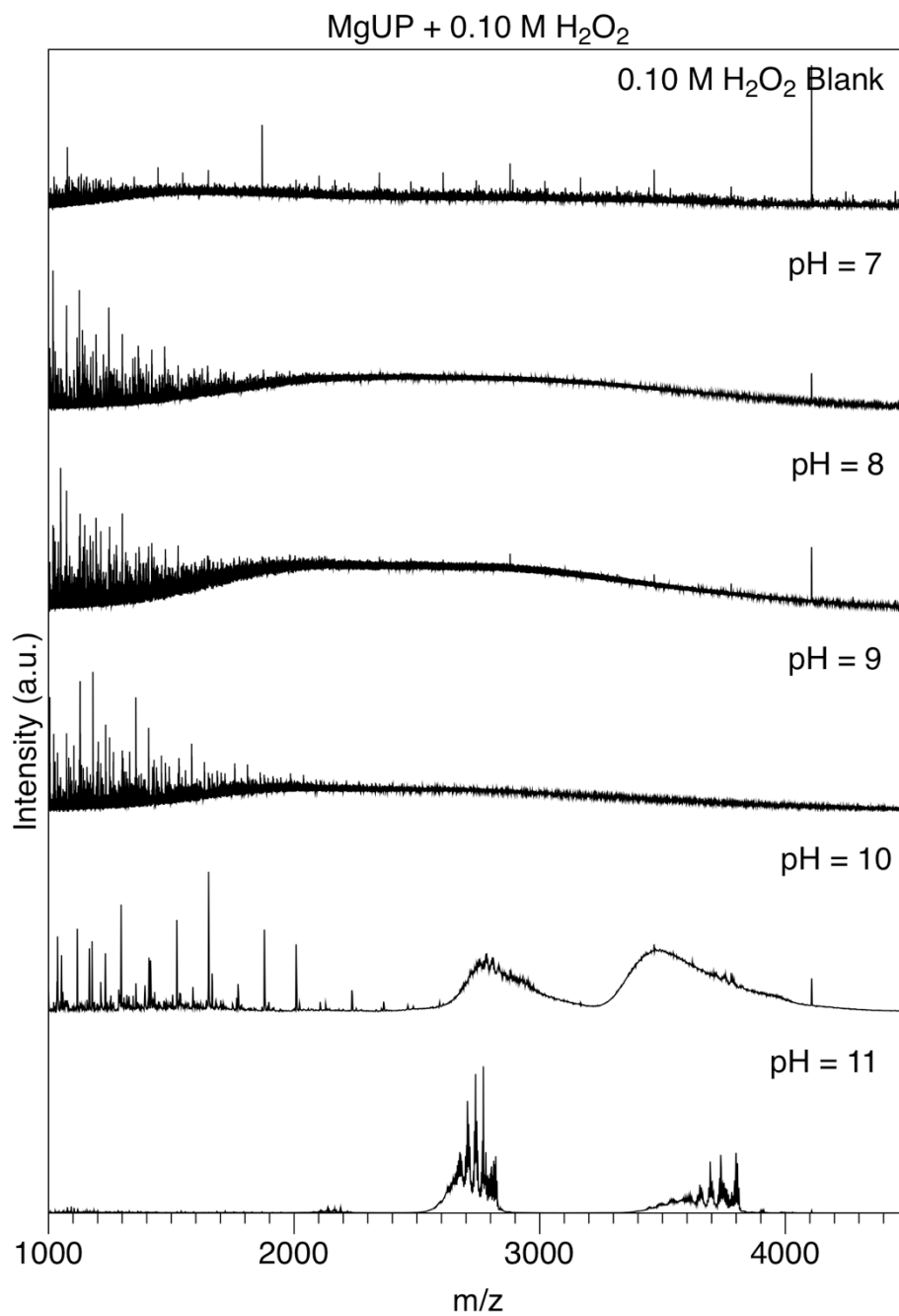


Figure S43. ESI-MS data from solutions resulting from mixing MgUP with 0.10 M H₂O₂ at pH 7 to 11.

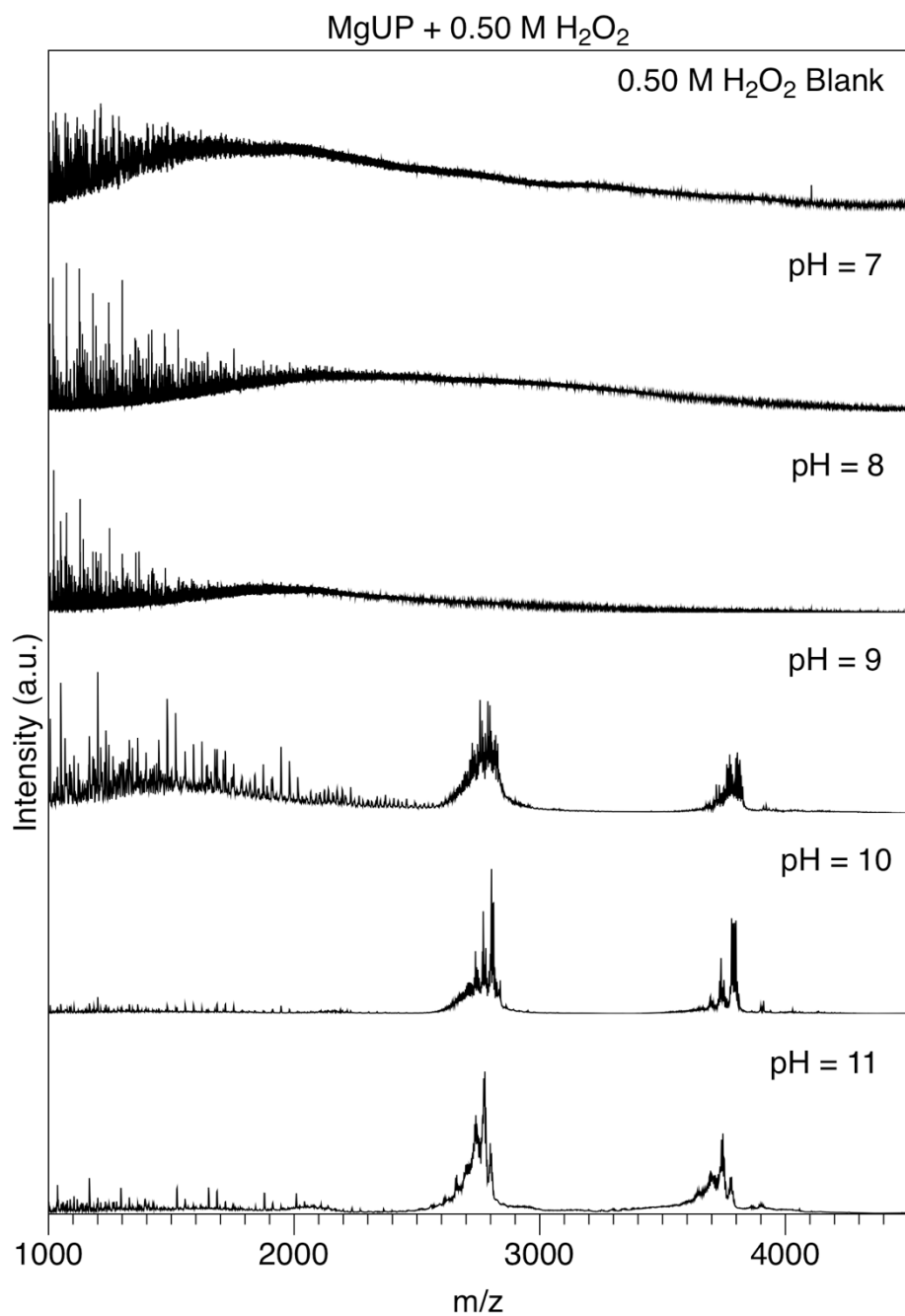


Figure S44. ESI-MS data from solutions resulting from mixing MgUP with 0.50 M H₂O₂ at pH 7 to 11.

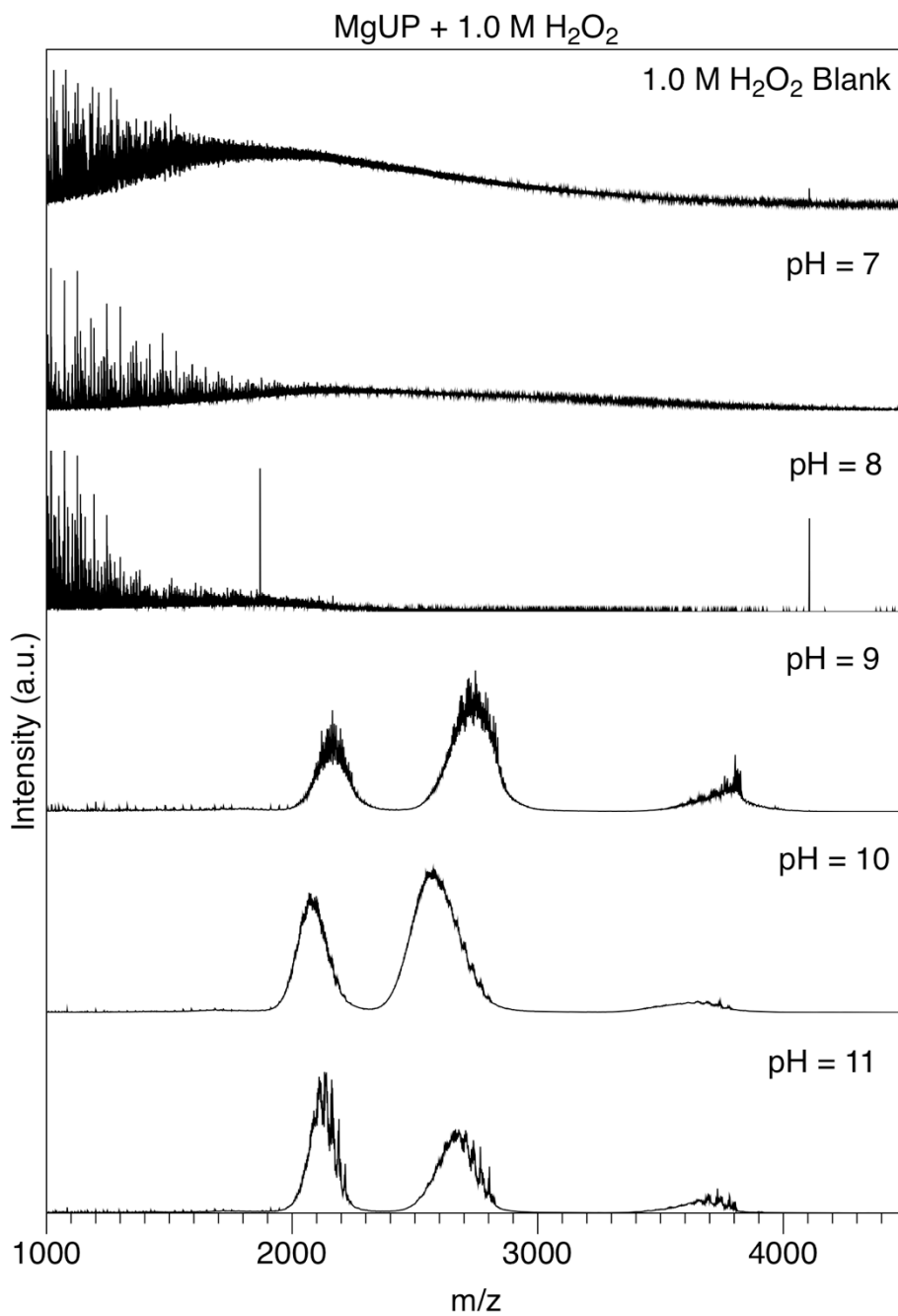


Figure S45. ESI-MS data from solutions resulting from mixing MgUP with 1.0 M H₂O₂ at pH 7 to 11.

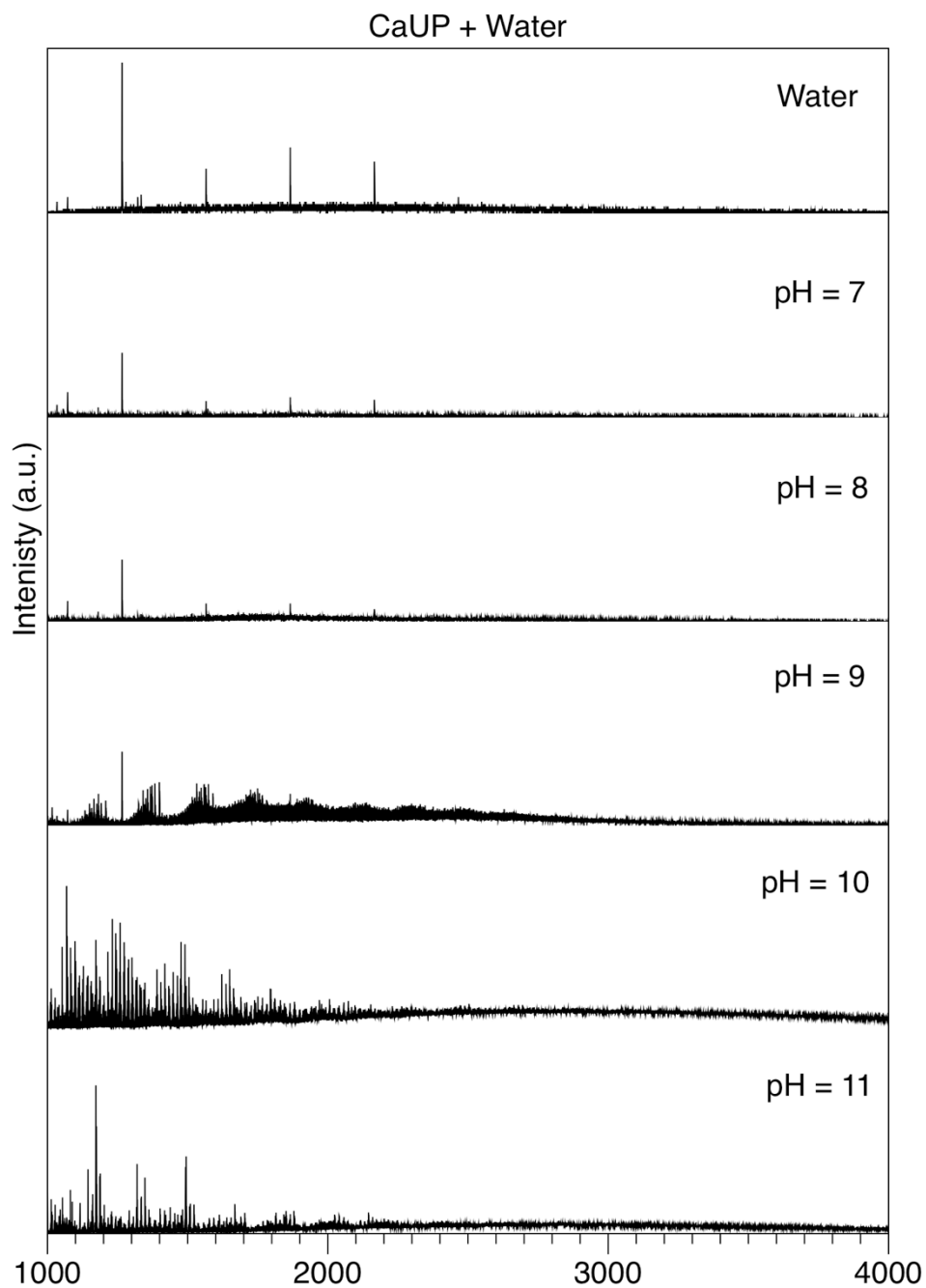


Figure S46. ESI-MS data from solutions resulting from mixing CaUP with water at pH 7 to 11.

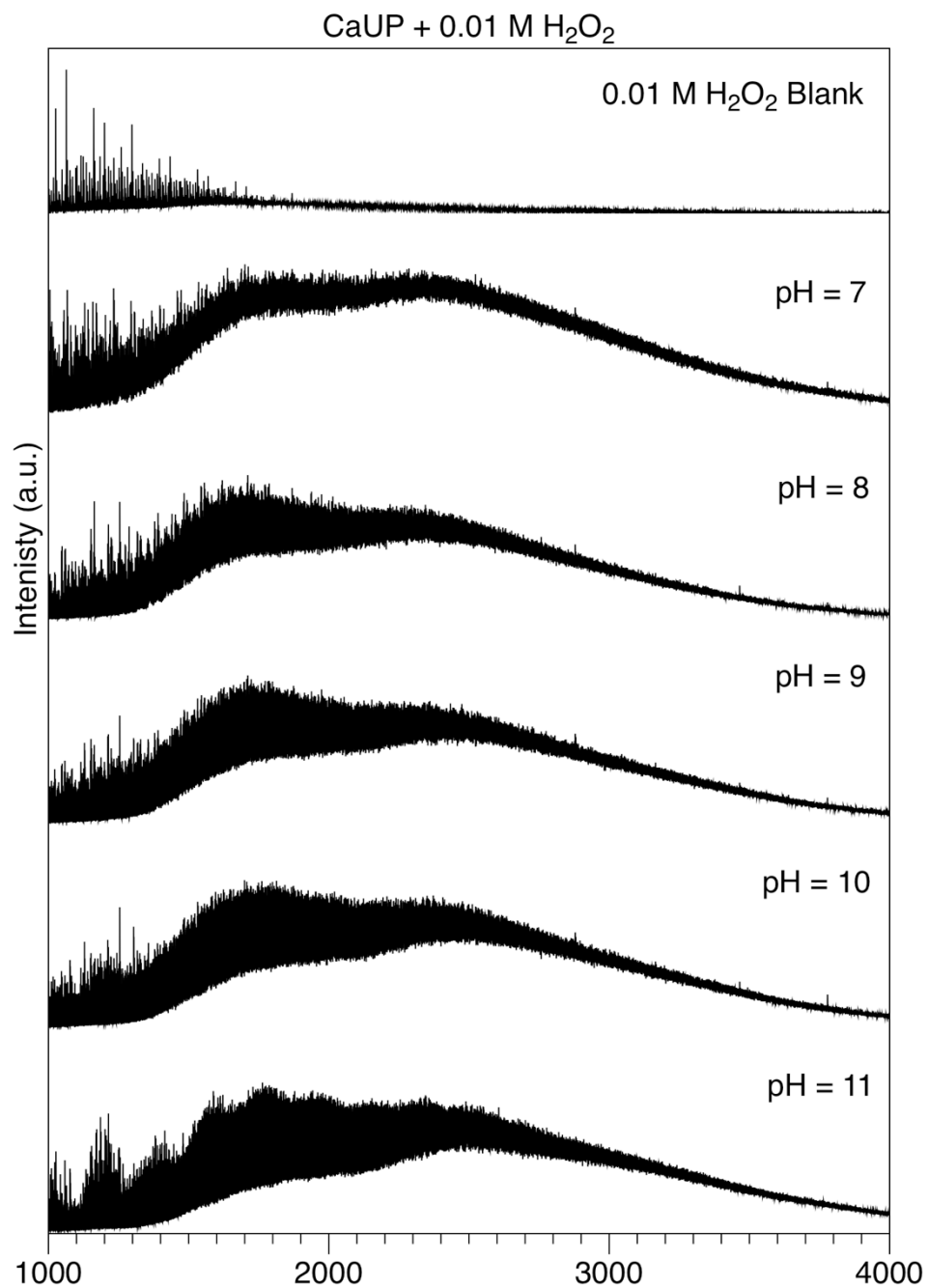


Figure S47. ESI-MS data from solutions resulting from mixing CaUP with 0.01 M H₂O₂ at pH 7 to 11.

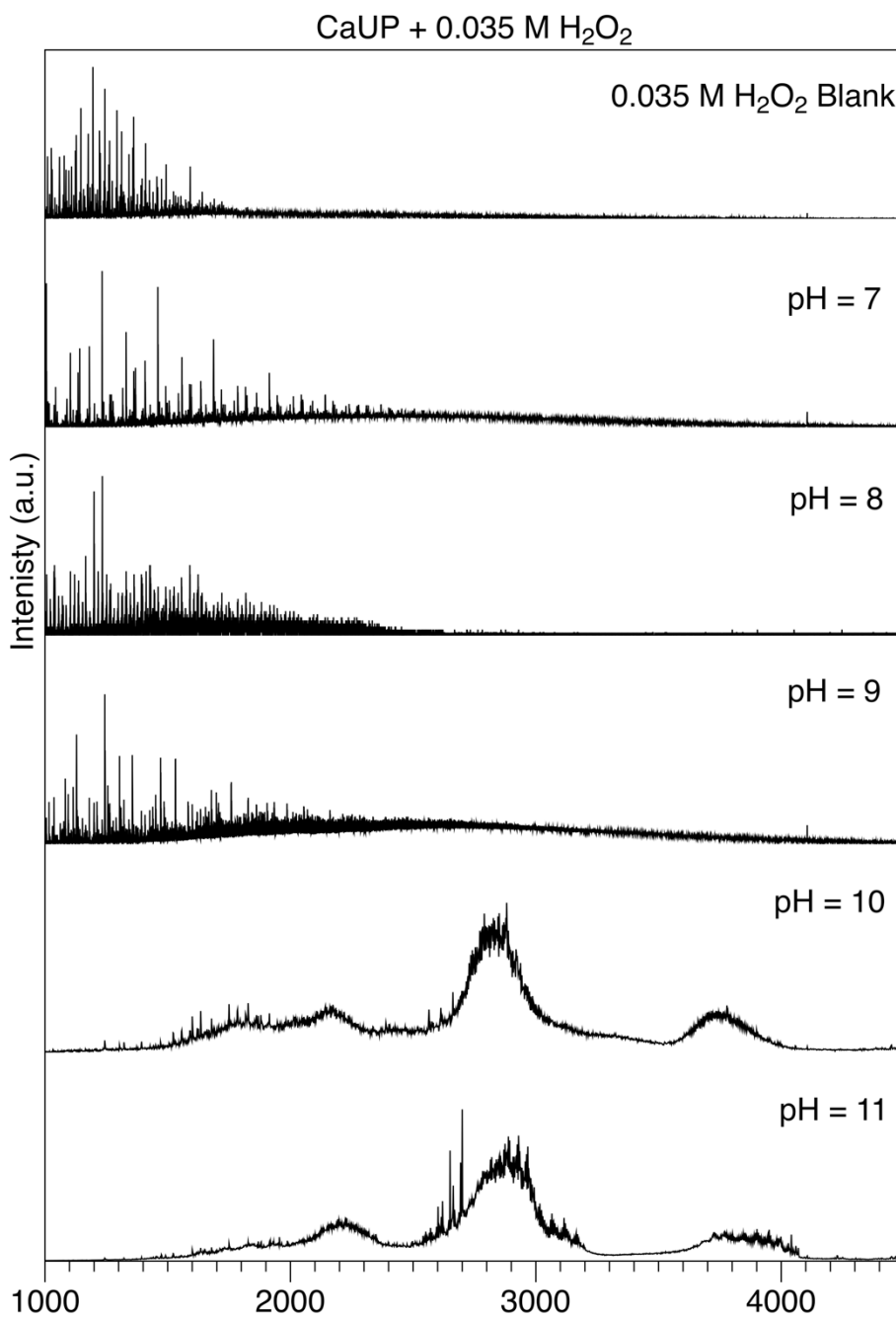


Figure S48. ESI-MS data from solutions resulting from mixing CaUP with 0.035 M H₂O₂ at pH 7 to 11.

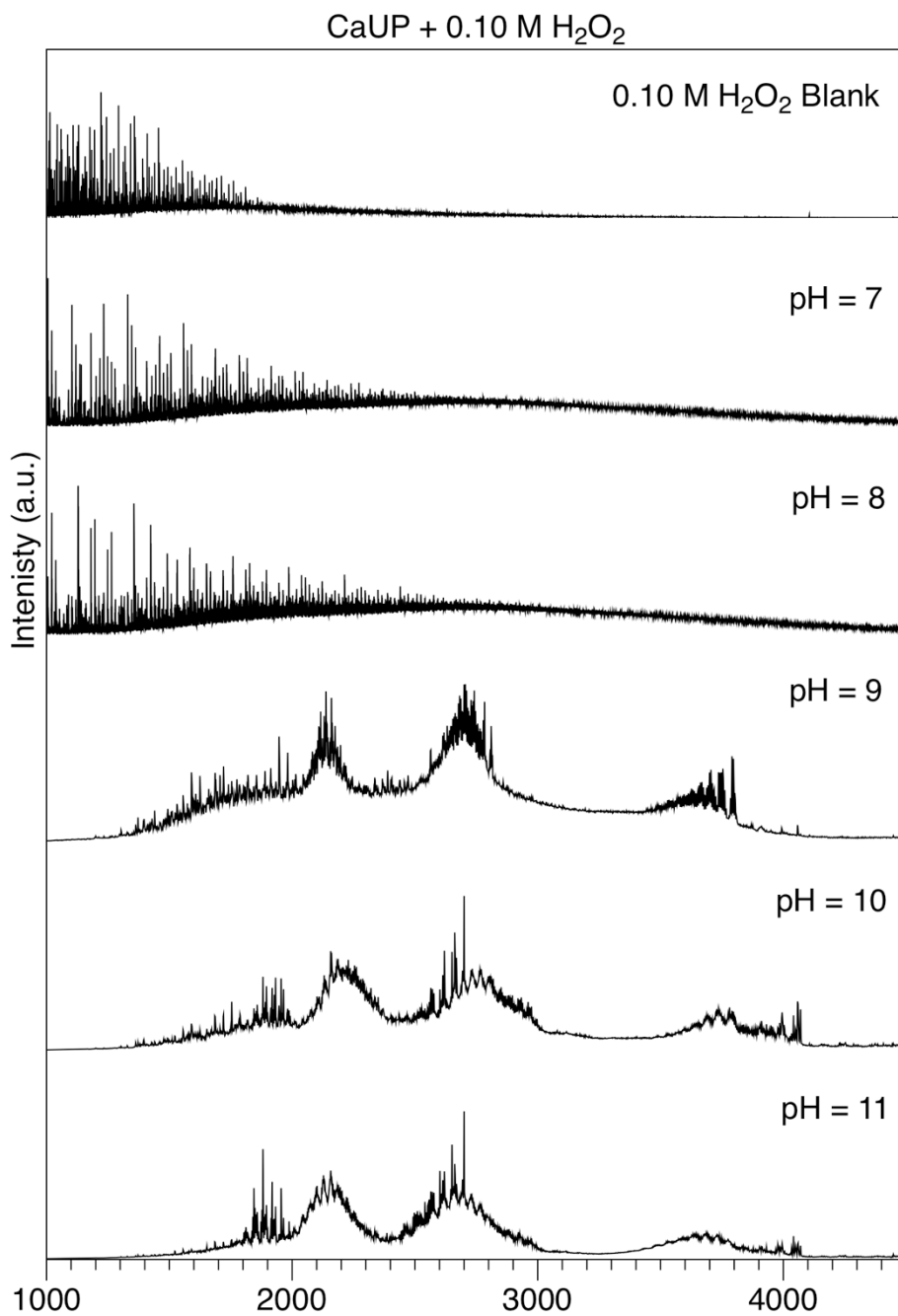


Figure S49. ESI-MS data from solutions resulting from mixing CaUP with 0.10 M H₂O₂ at pH 7 to 11.

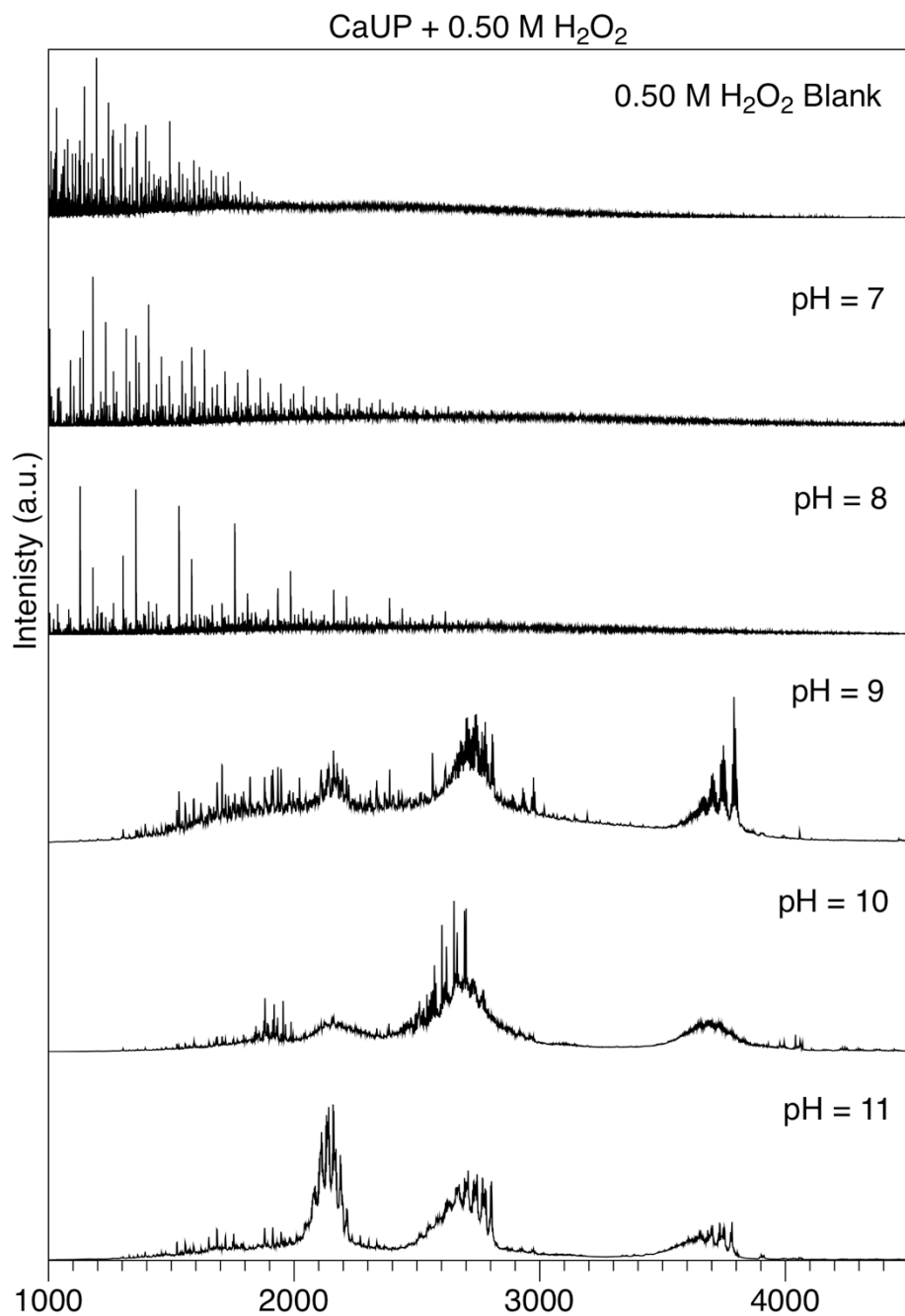


Figure S50. ESI-MS data from solutions resulting from mixing CaUP with 0.50 M H₂O₂ at pH 7 to 11.

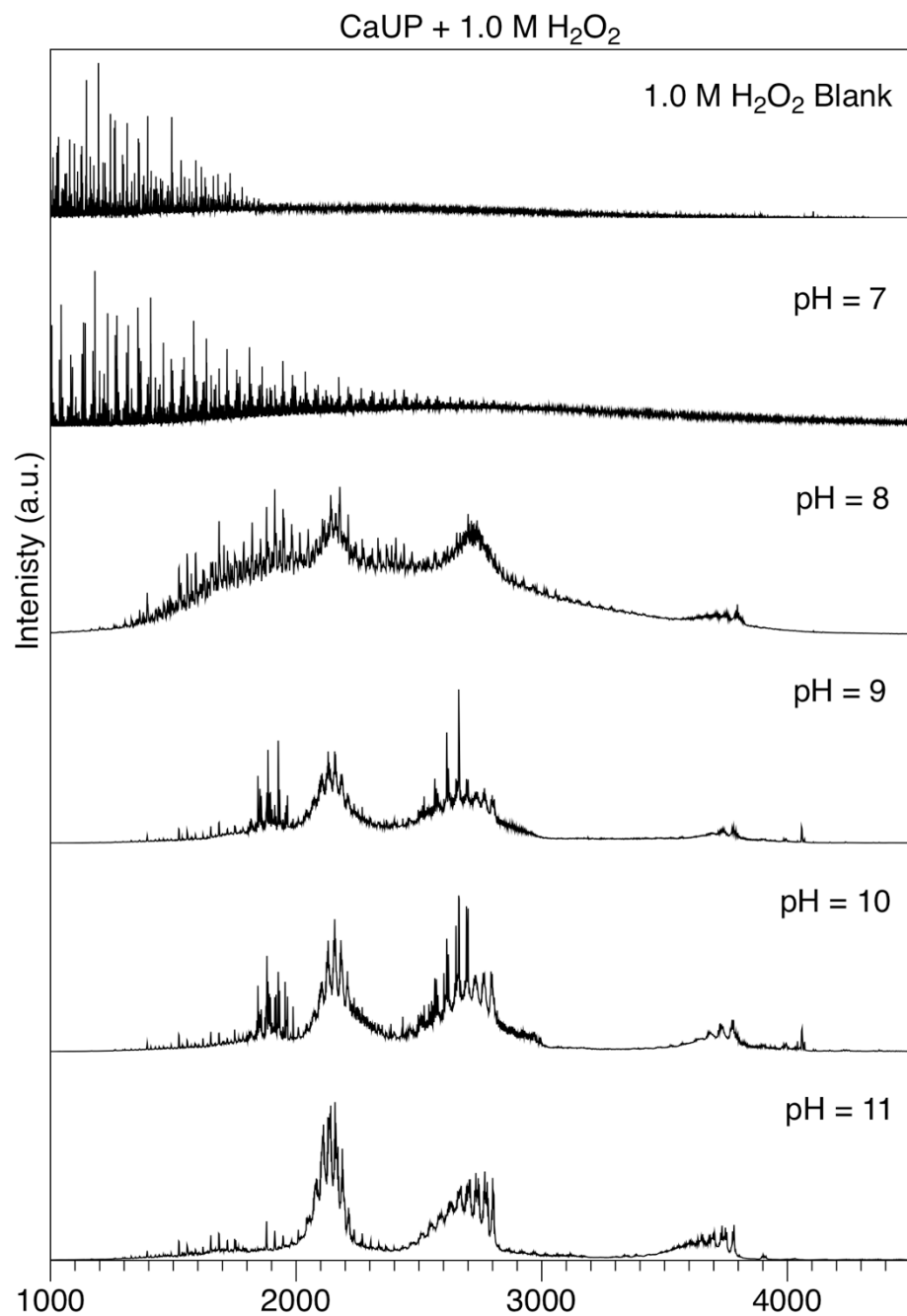


Figure S51. ESI-MS data from solutions resulting from mixing CaUP with 1.0 M H₂O₂ at pH 7 to 11.

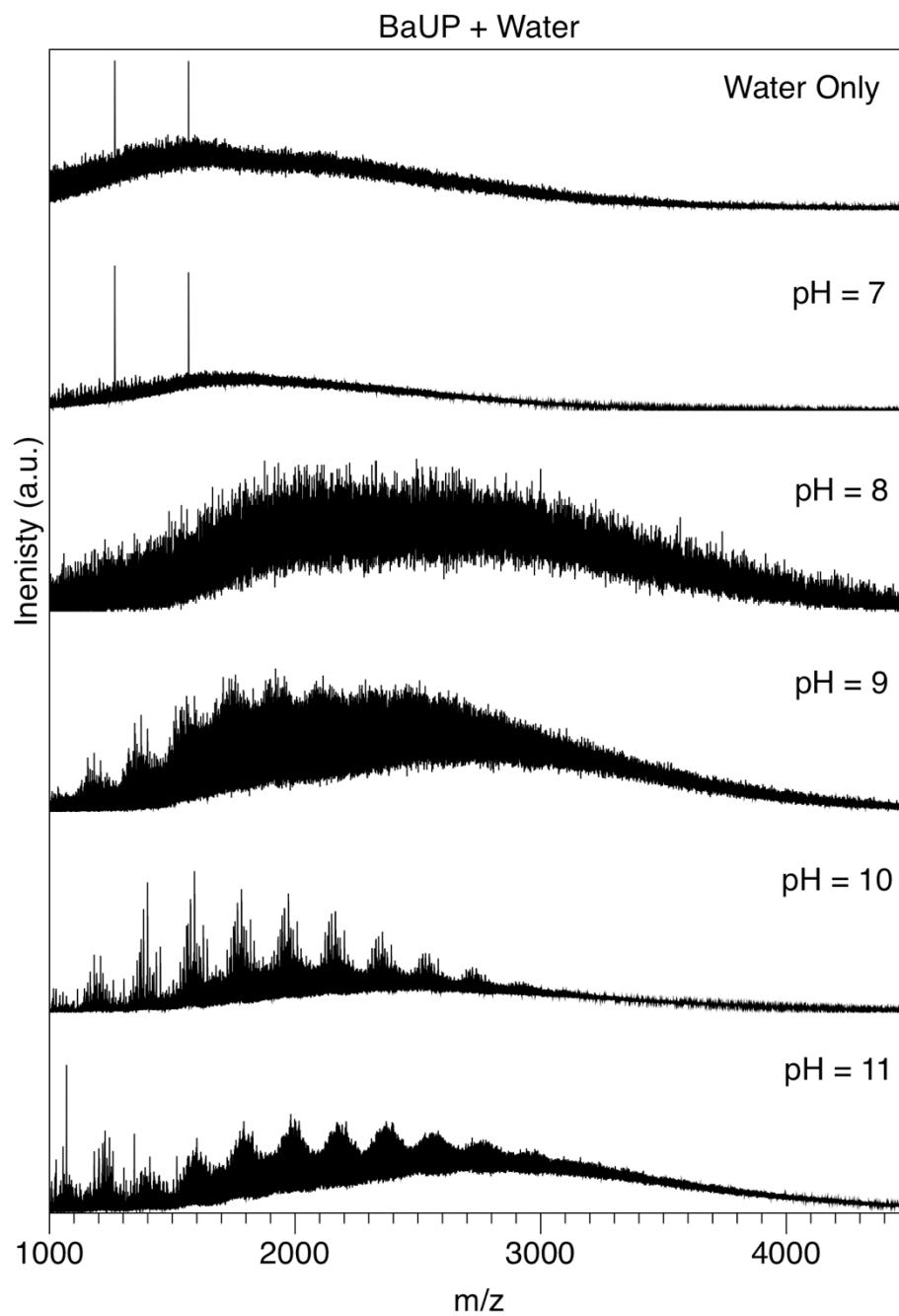


Figure S52. ESI-MS data from solutions resulting from mixing BaUP with water at pH 7 to 11.

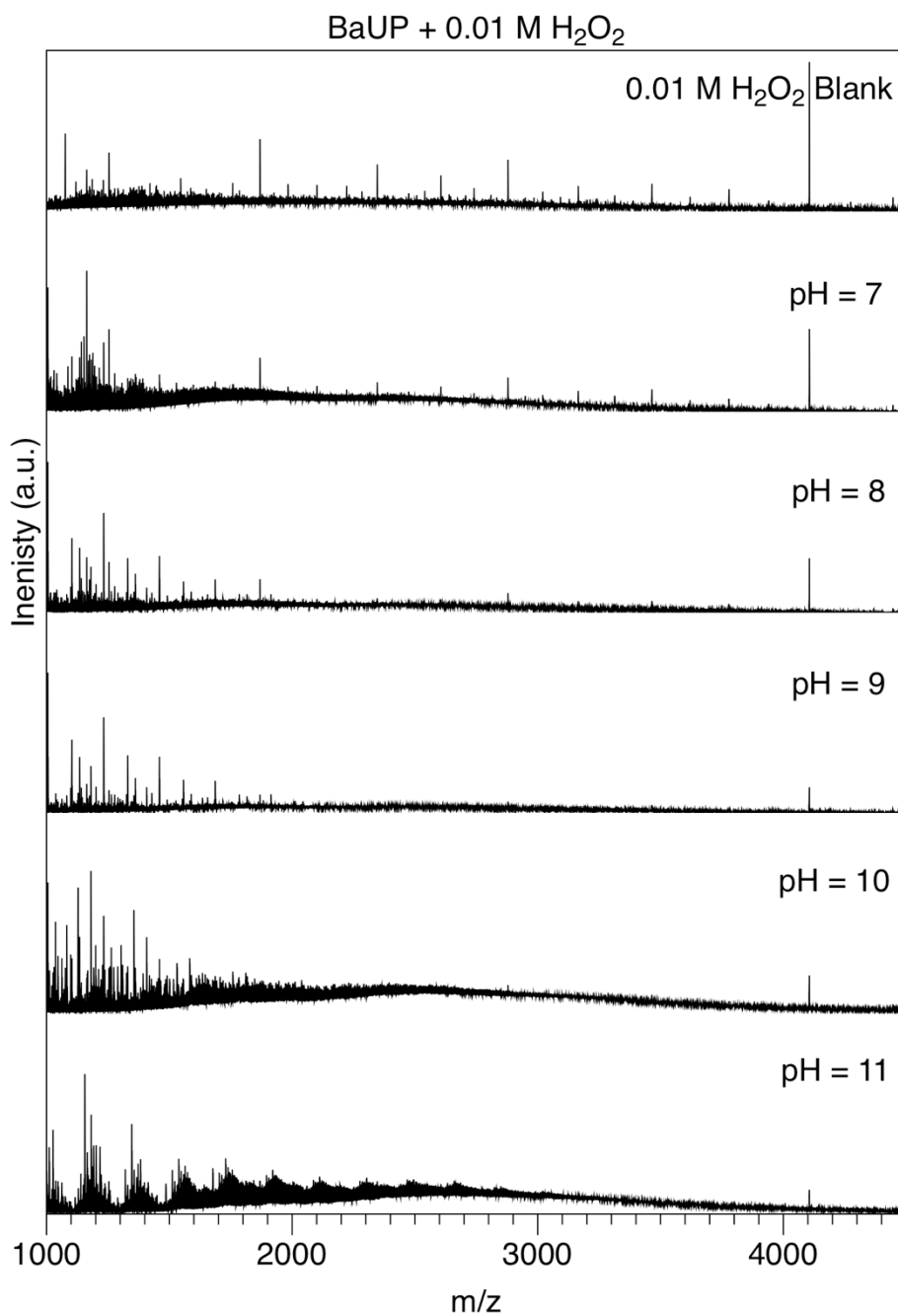


Figure S53. ESI-MS data from solutions resulting from mixing BaUP with 0.01 M H₂O₂ at pH 7 to 11.

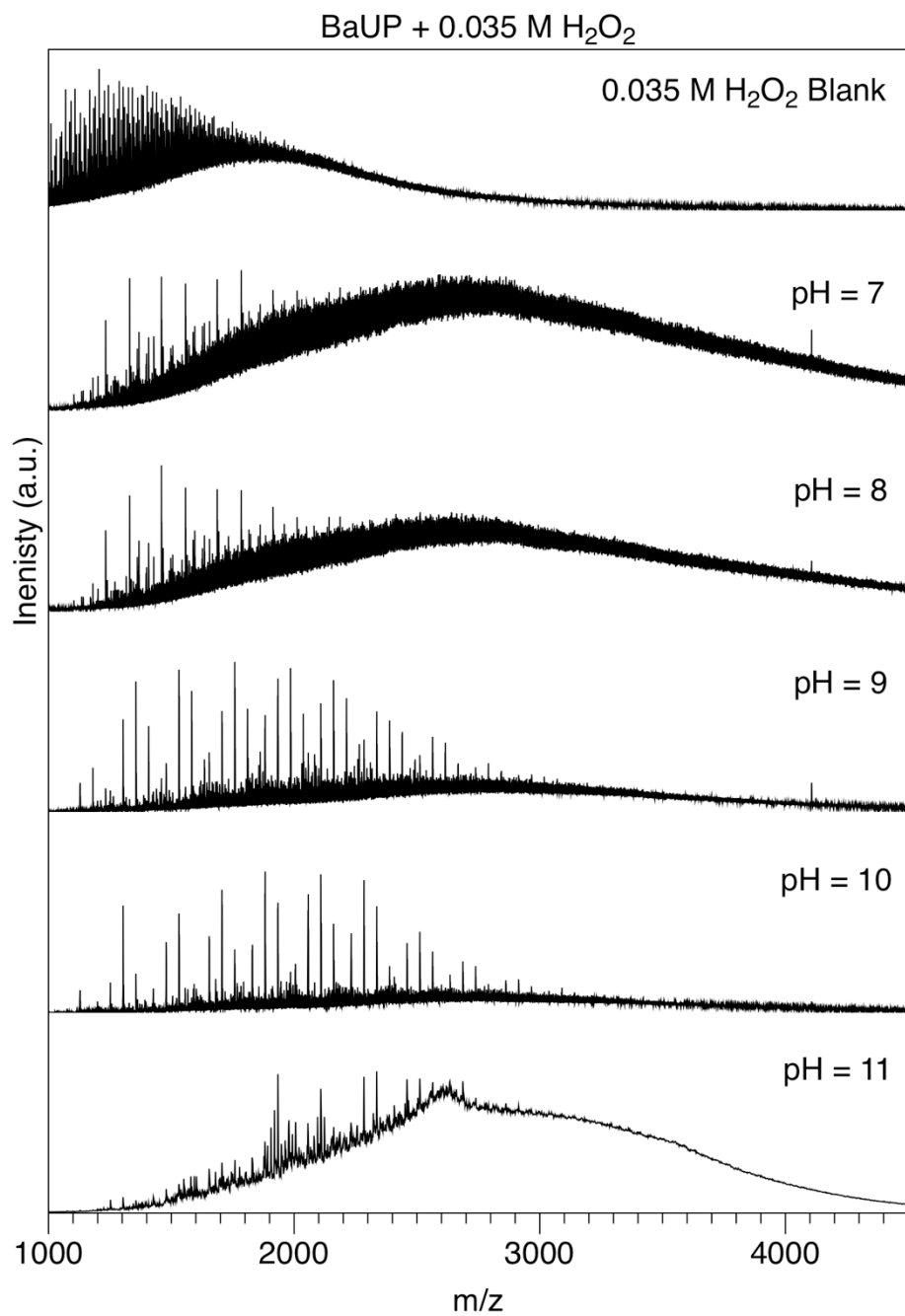


Figure S54. ESI-MS data from solutions resulting from mixing BaUP with 0.035 M H₂O₂ at pH 7 to 11.

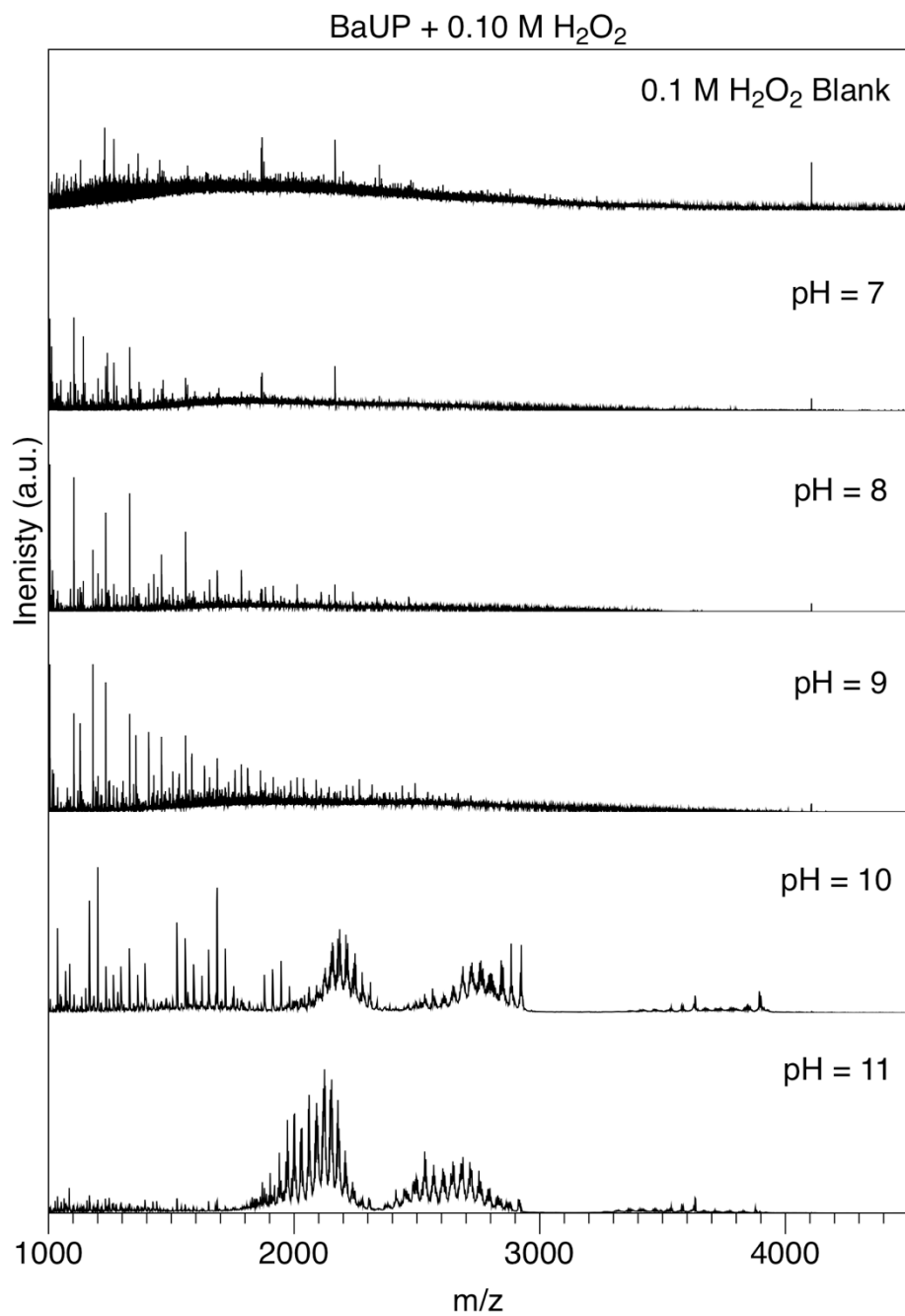


Figure S55. ESI-MS data from solutions resulting from mixing BaUP with 0.10 M H₂O₂ at pH 7 to 11.

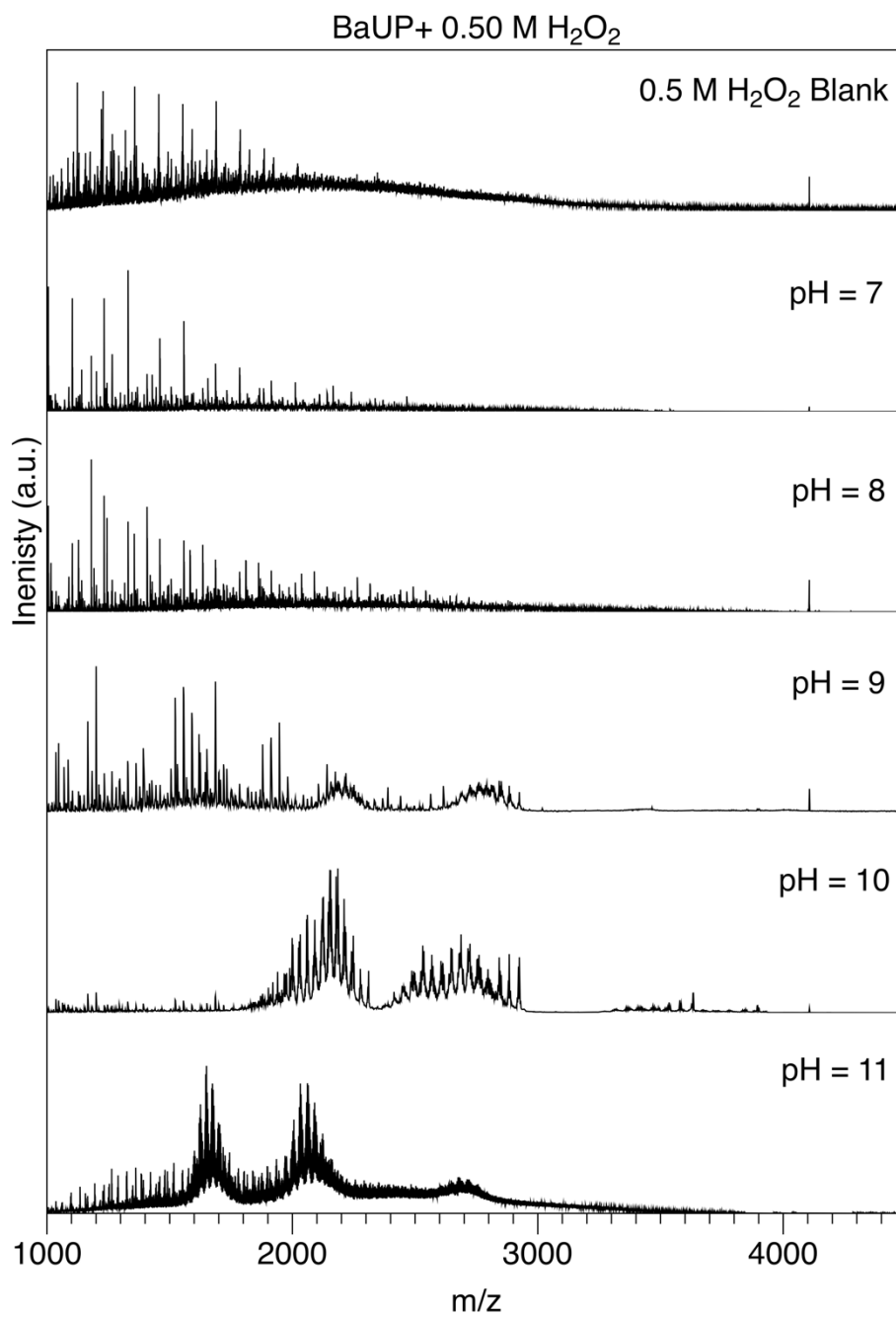


Figure S56. ESI-MS data from solutions resulting from mixing BaUP with 0.50 M H₂O₂ at pH 7 to 11.

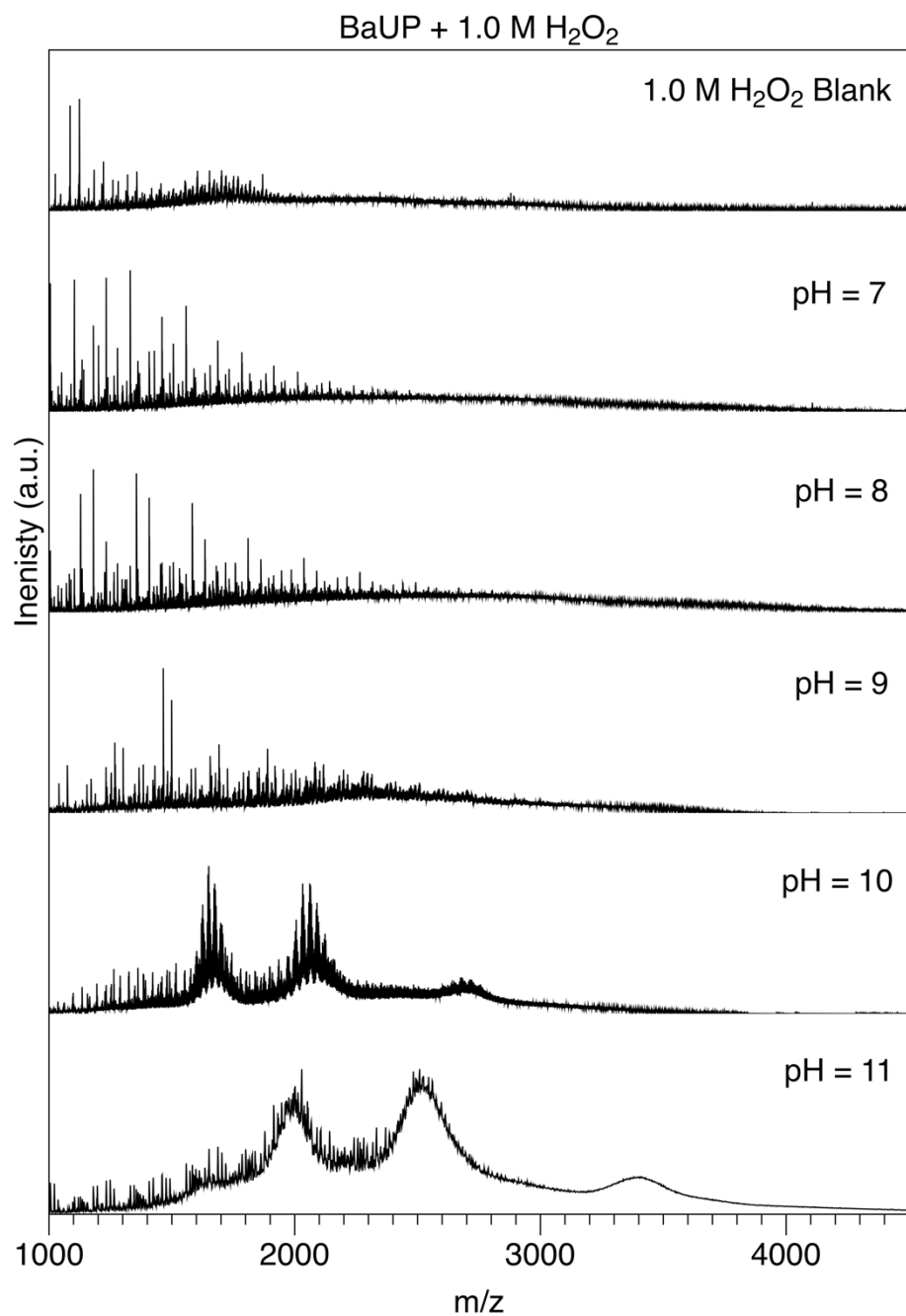


Figure S57. ESI-MS data from solutions resulting from mixing BaUP with 1.0 M H₂O₂ at pH 7 to 11.

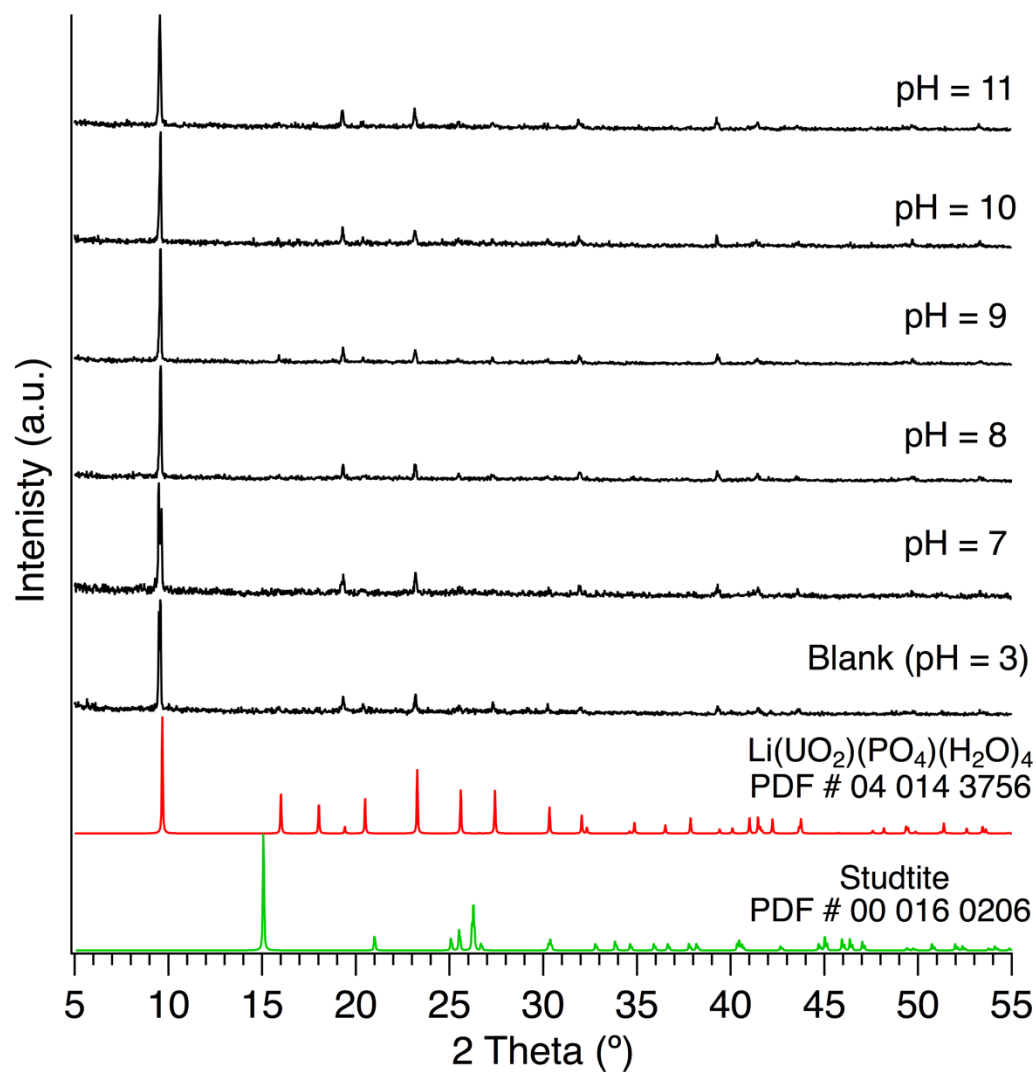


Figure S58. PXRD spectra from solids resulting from mixing LiUP with water at pH 7 to 11.

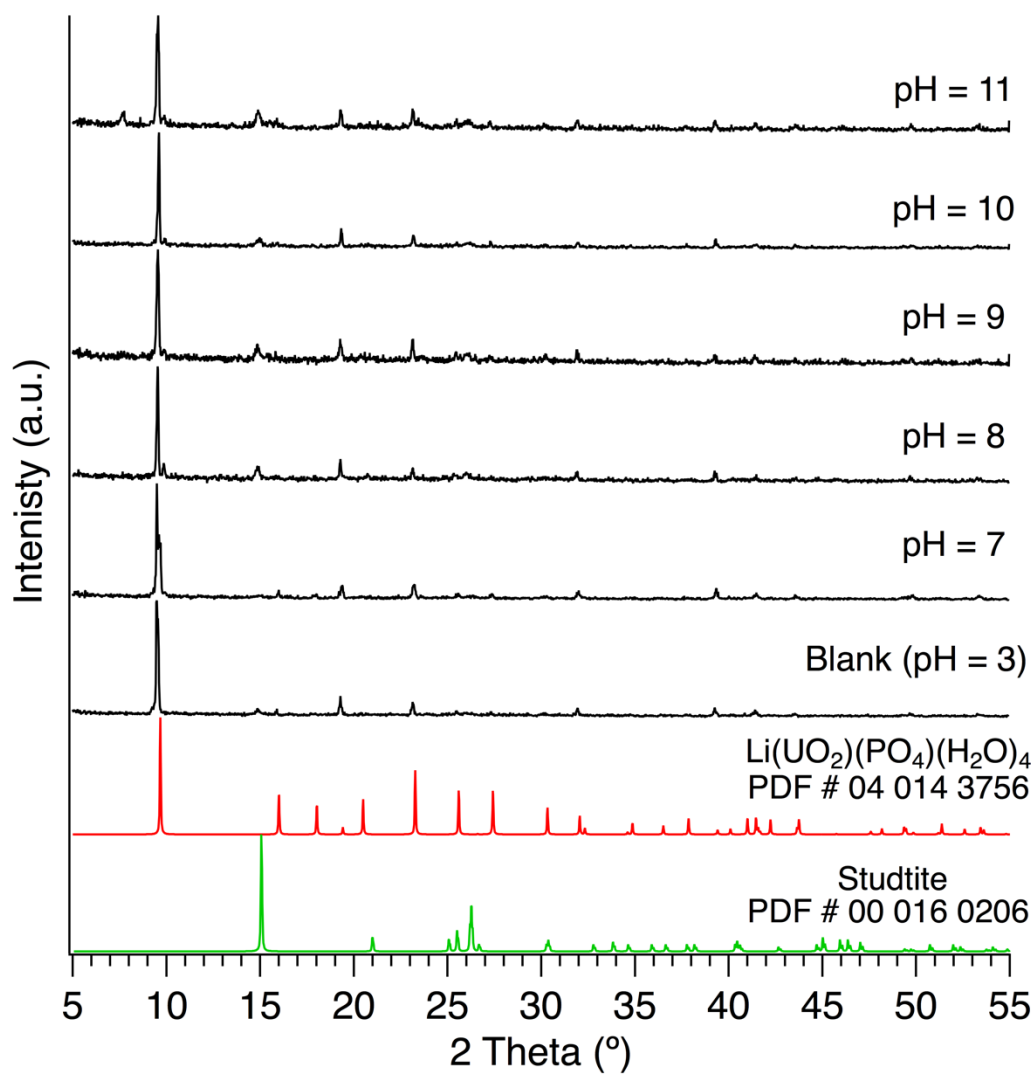


Figure S59. PXRD spectra from solids resulting from mixing LiUP with 0.01M H₂O₂ at pH 7 to 11.

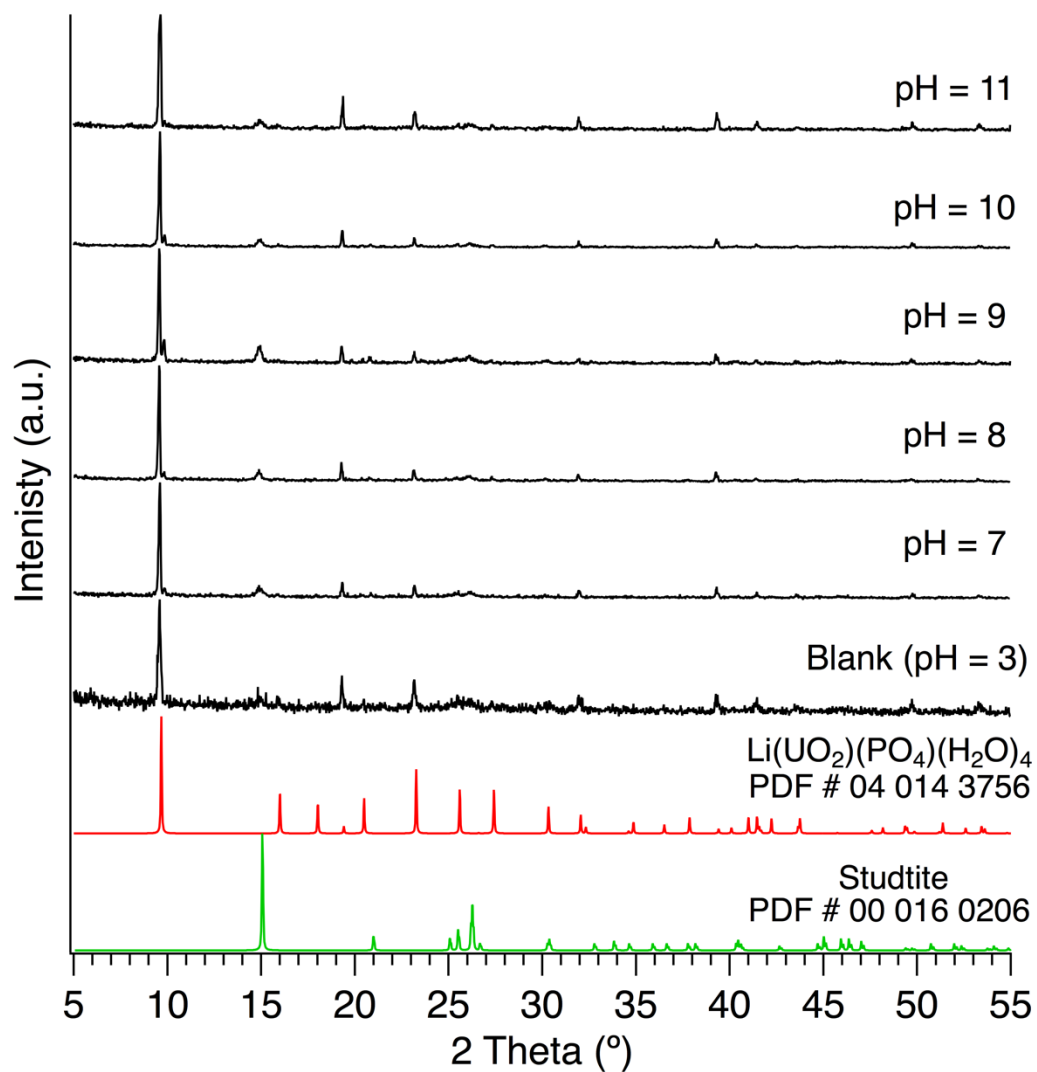


Figure S60. PXRD spectra from solids resulting from mixing LiUP with 0.035 M H_2O_2 at pH 7 to 11.

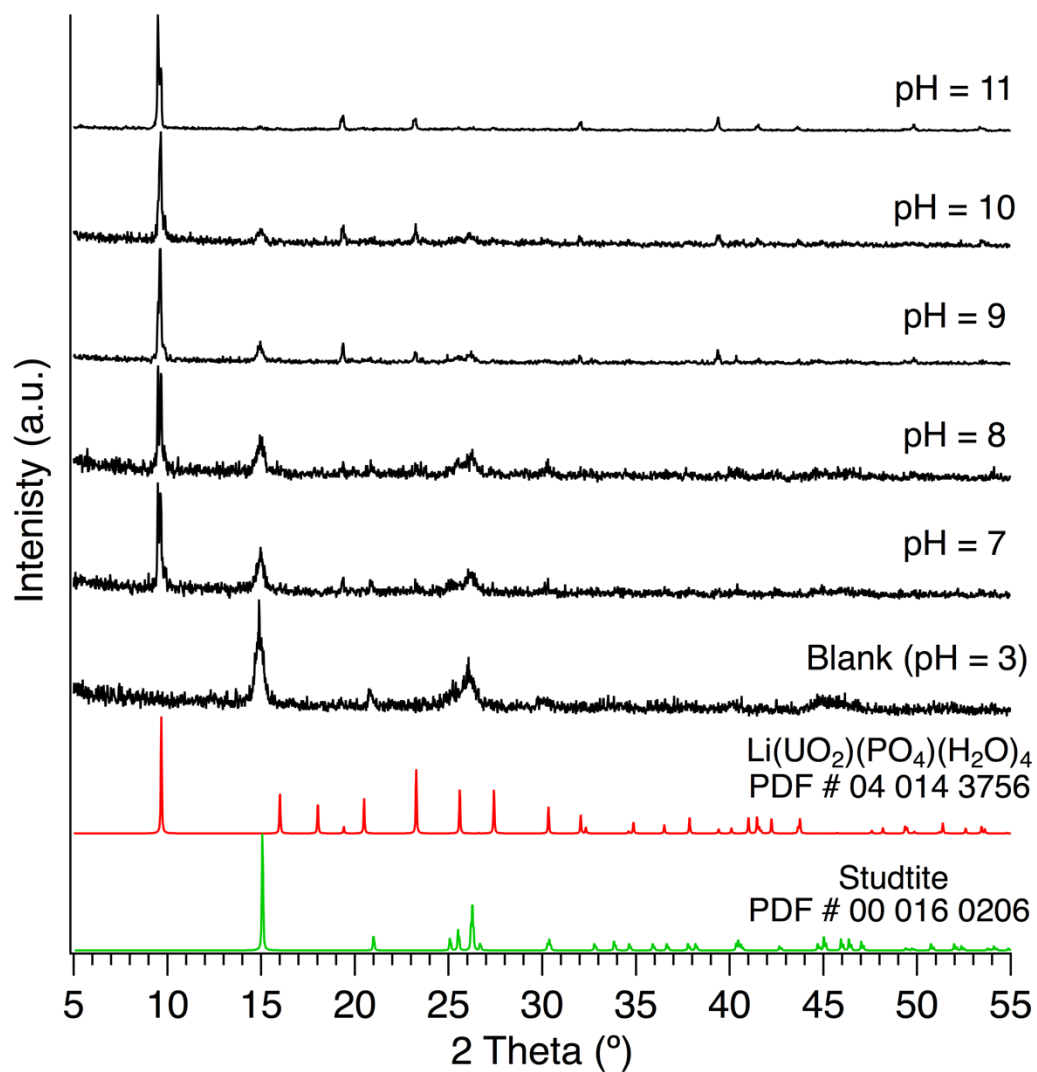


Figure S61. PXRD spectra from solids resulting from mixing LiUP with 0.10 M H_2O_2 at pH 7 to 11.

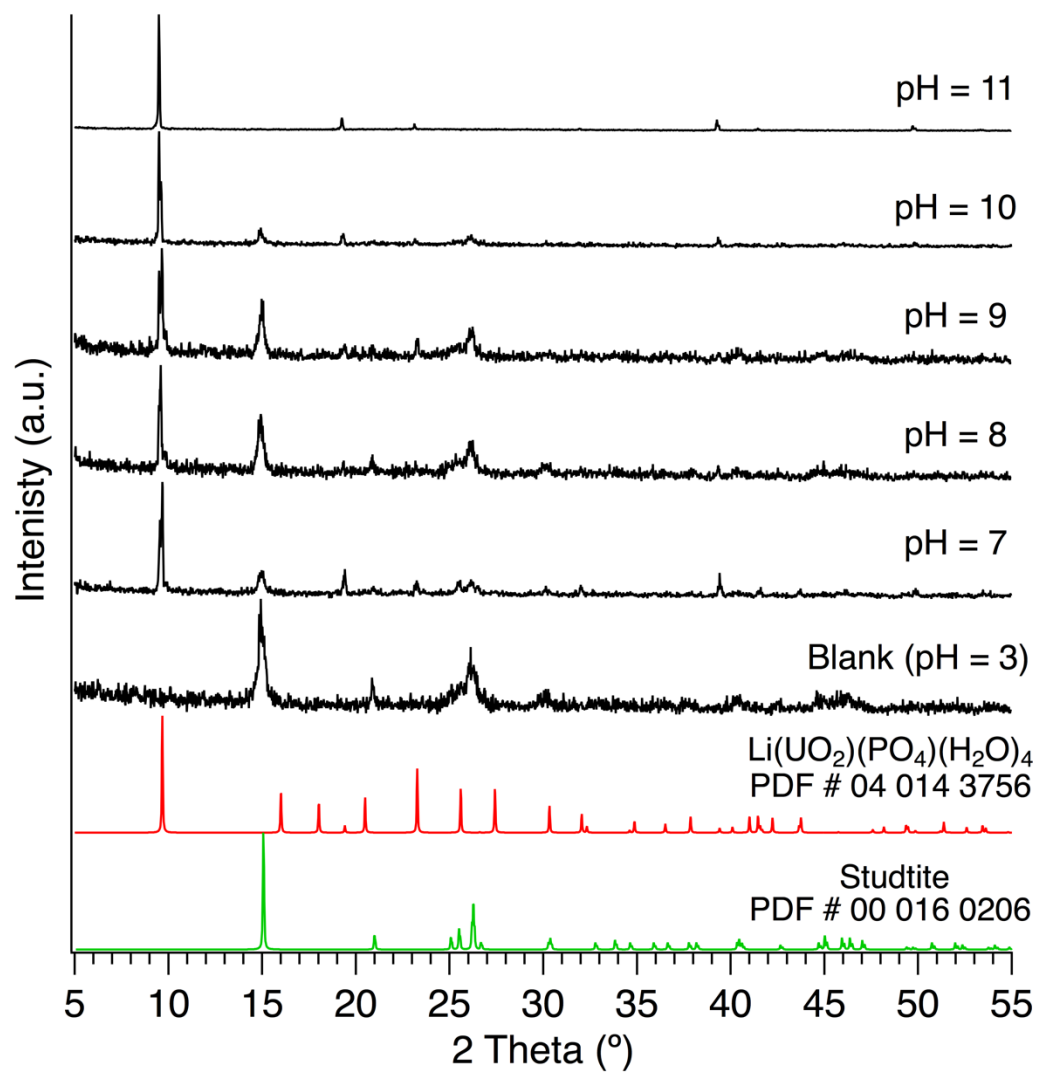


Figure S62. PXRD spectra from solids resulting from mixing LiUP with 0.50 M H₂O₂ at pH 7 to 11.

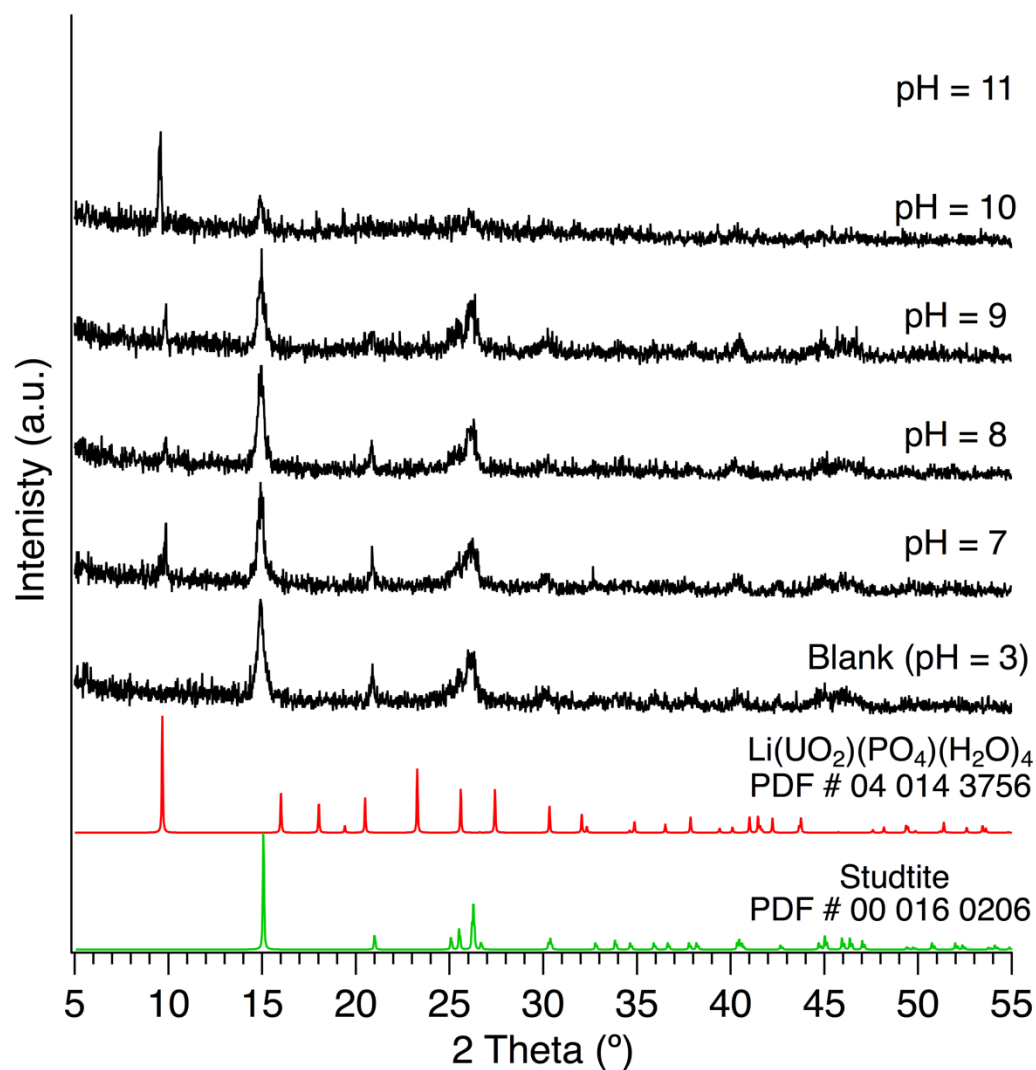


Figure S63. PXRD spectra from solids resulting from mixing LiUP with 1.0 M H₂O₂ at pH 7 to 11.

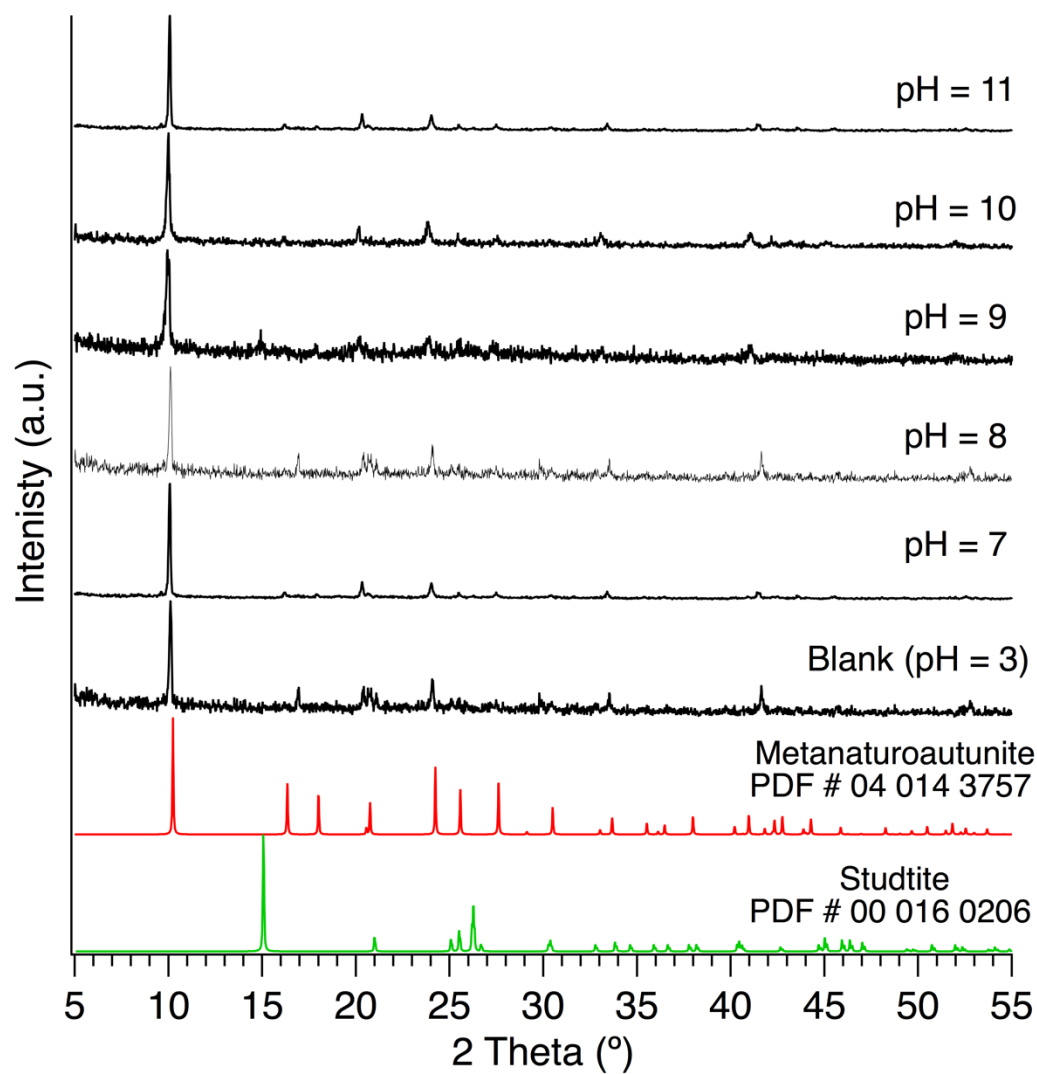


Figure S64. PXRD spectra from solids resulting from mixing NaUP with water at pH 7 to 11

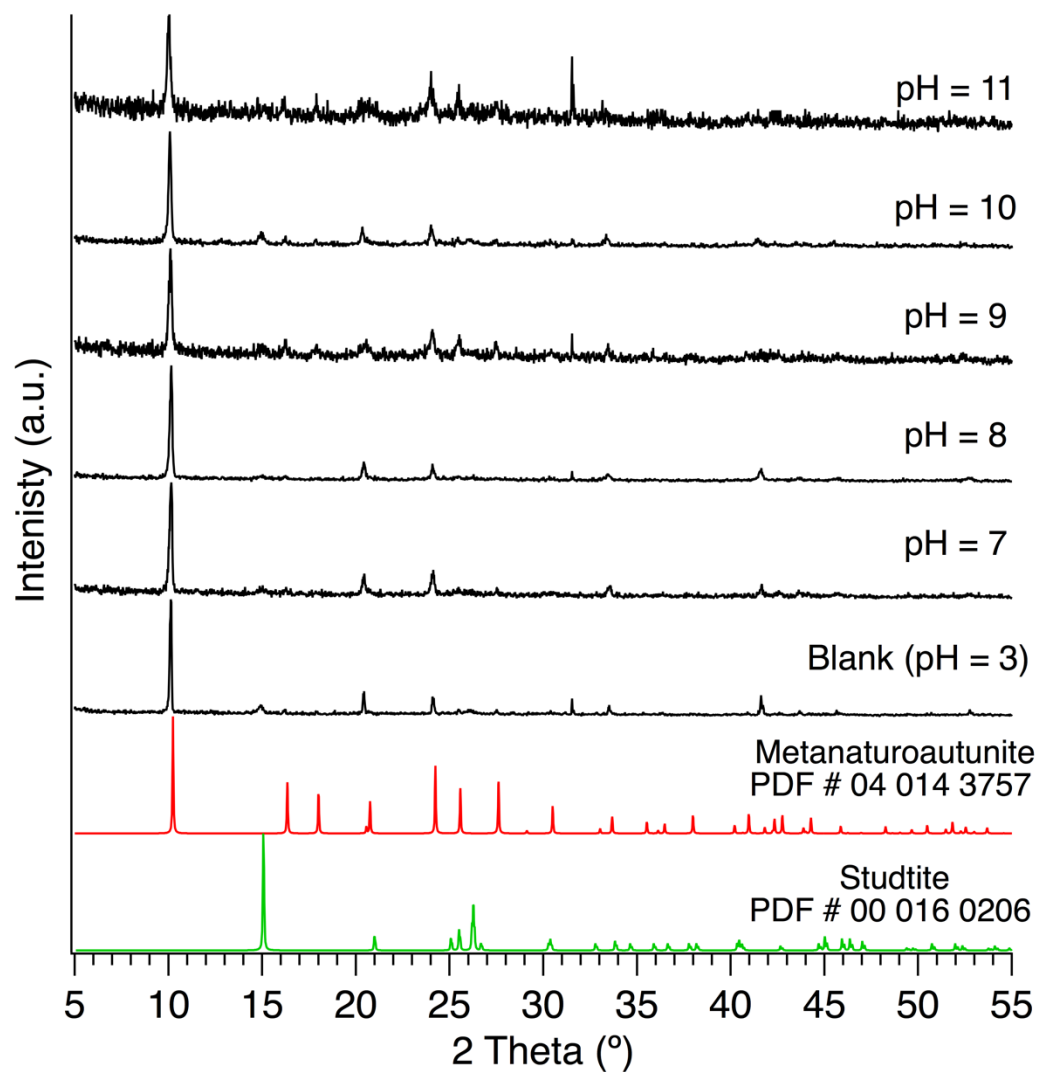


Figure S65. PXRD spectra from solids resulting from mixing NaUP with 0.01M H₂O₂ at pH 7 to 11.

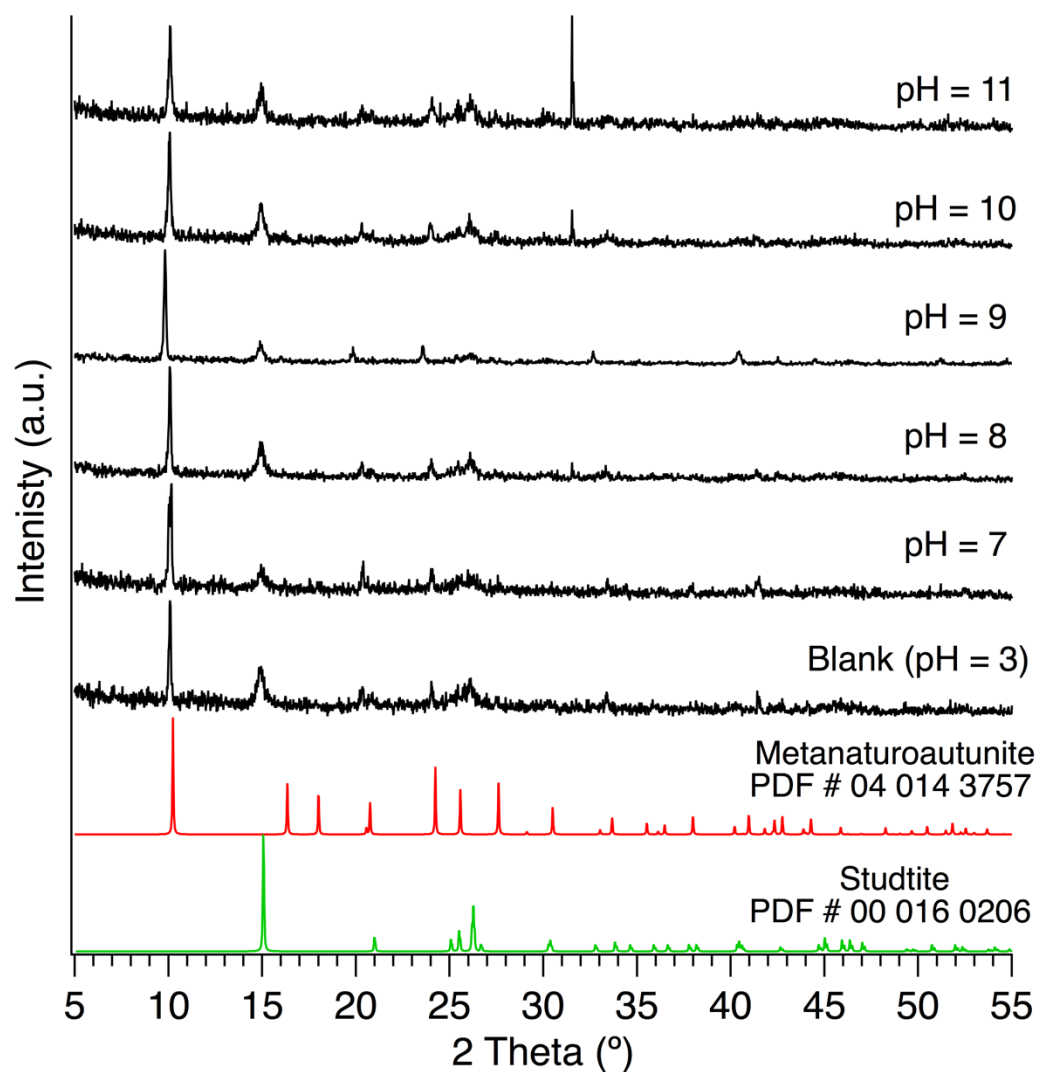


Figure S66. PXRD spectra from solids resulting from mixing NaUP with 0.035 M H₂O₂ at pH 7 to 11.

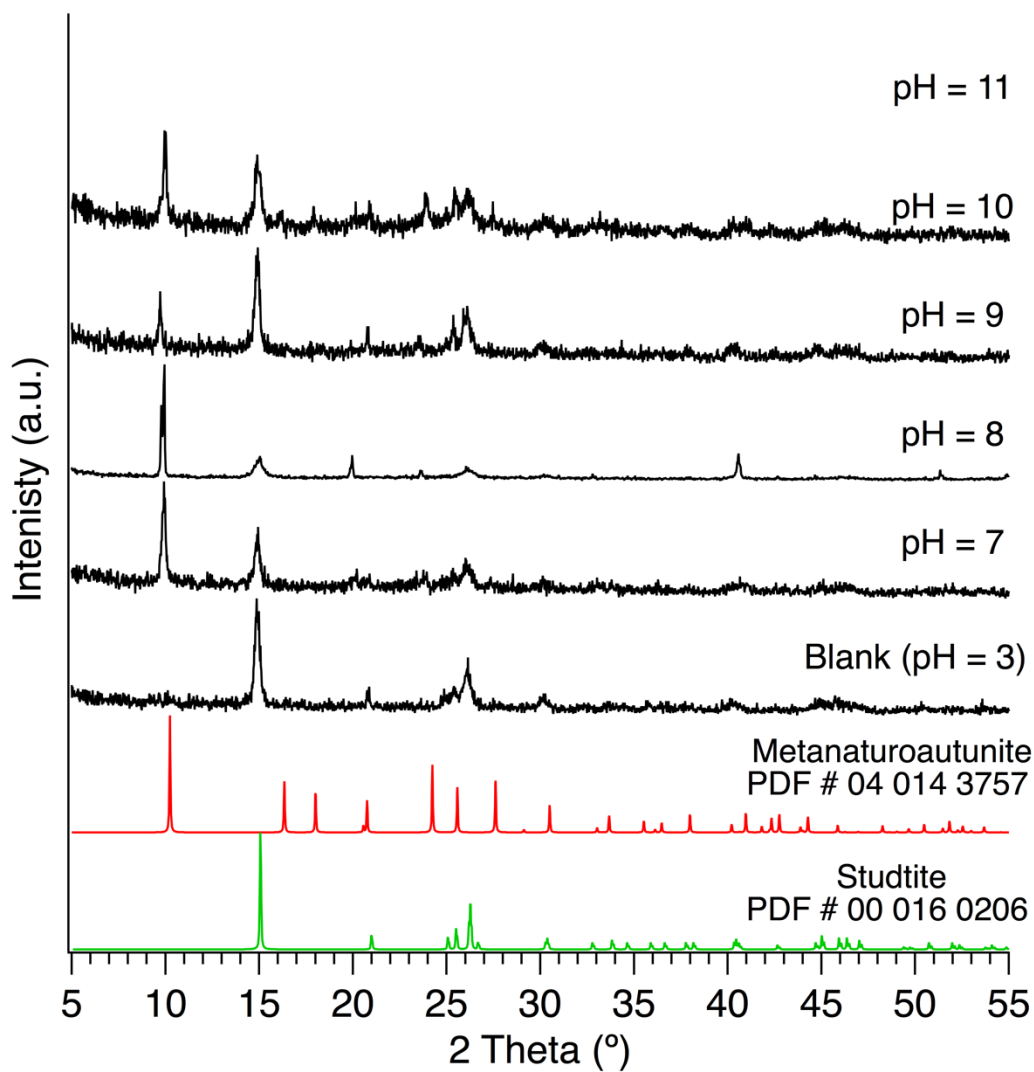


Figure S67. PXRD spectra from solids resulting from mixing NaUP with 0.10 M H₂O₂ at pH 7 to 11.

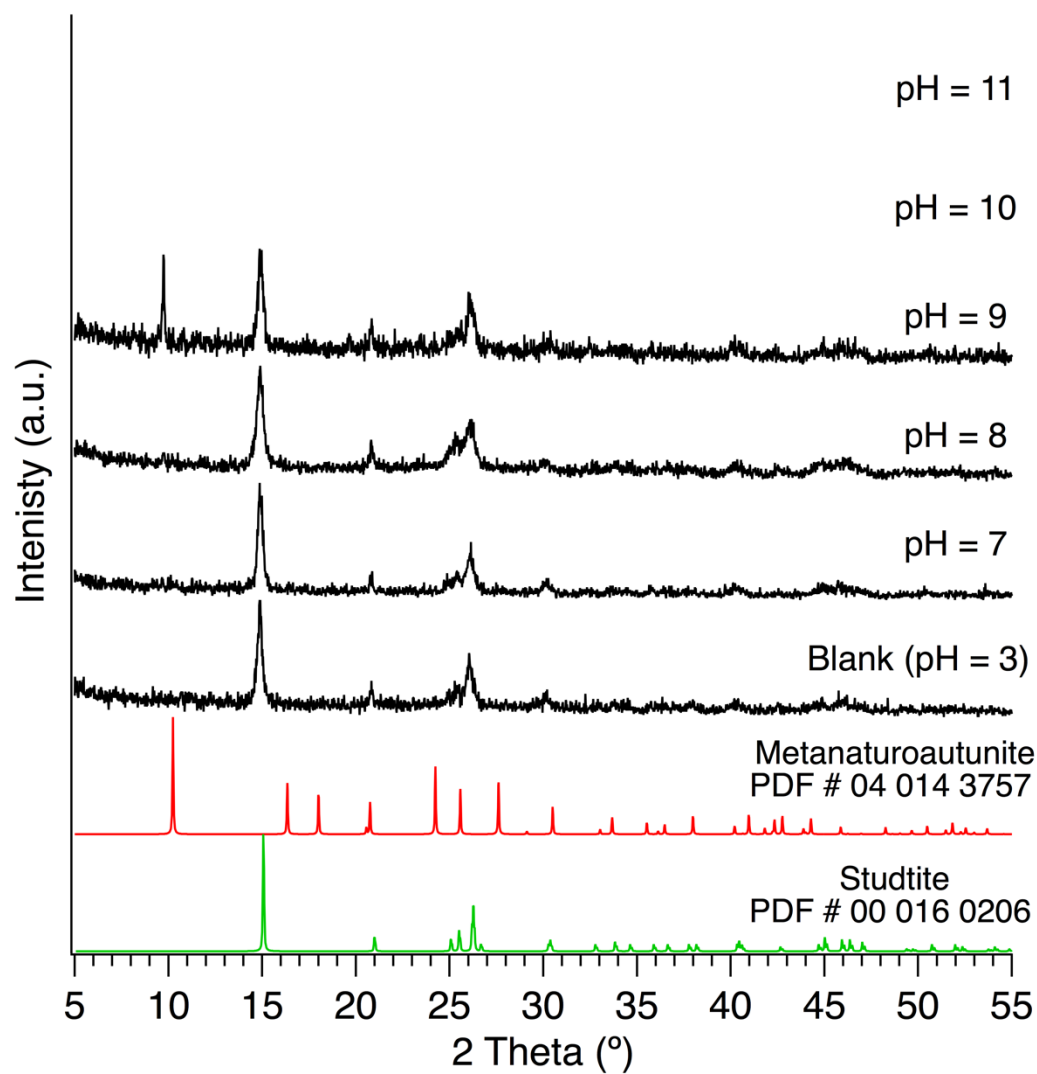


Figure S68. PXRD spectra from solids resulting from mixing NaUP with 0.50 M H₂O₂ at pH 7 to 11.

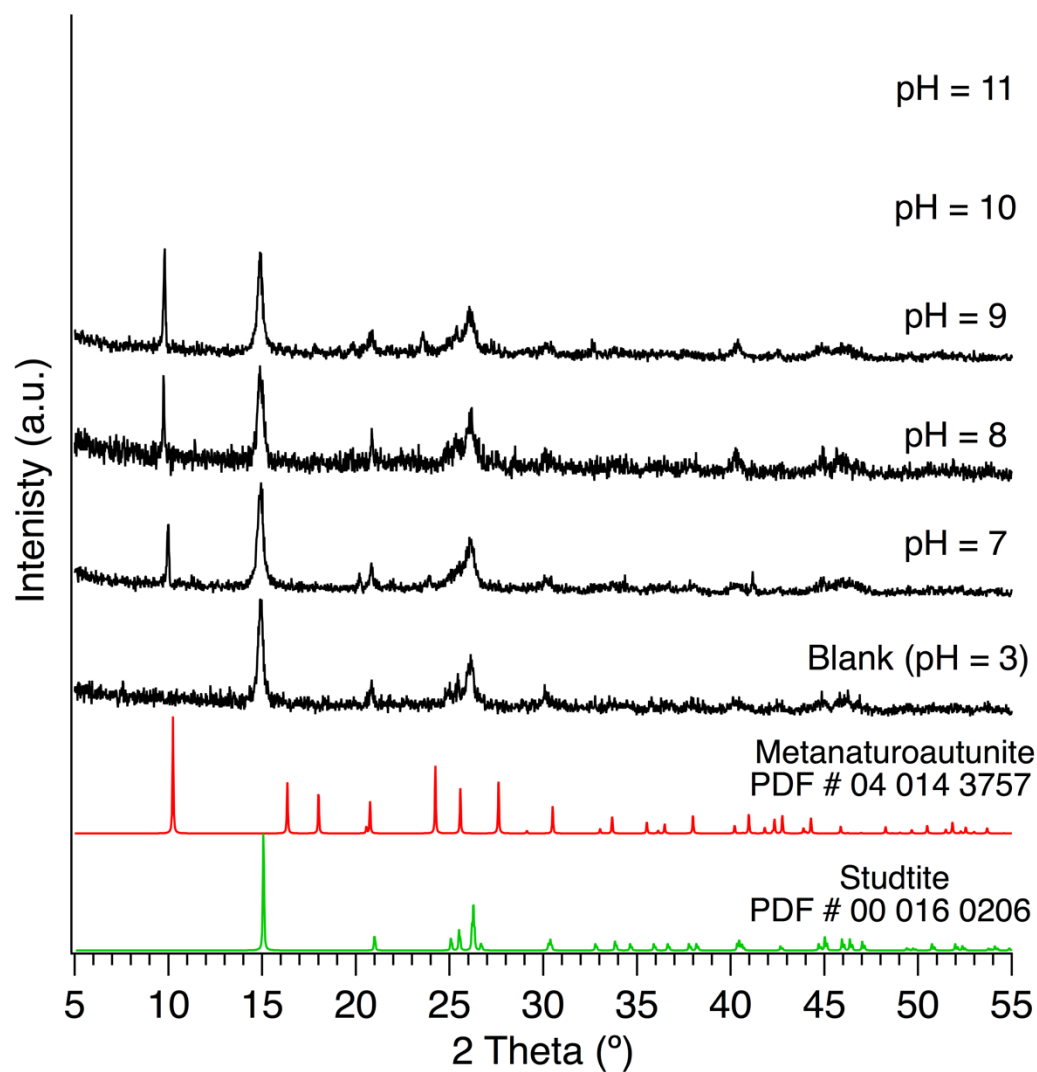


Figure S69. PXRD spectra from solids resulting from mixing NaUP with 1.0 M H₂O₂ at pH 7 to 11.

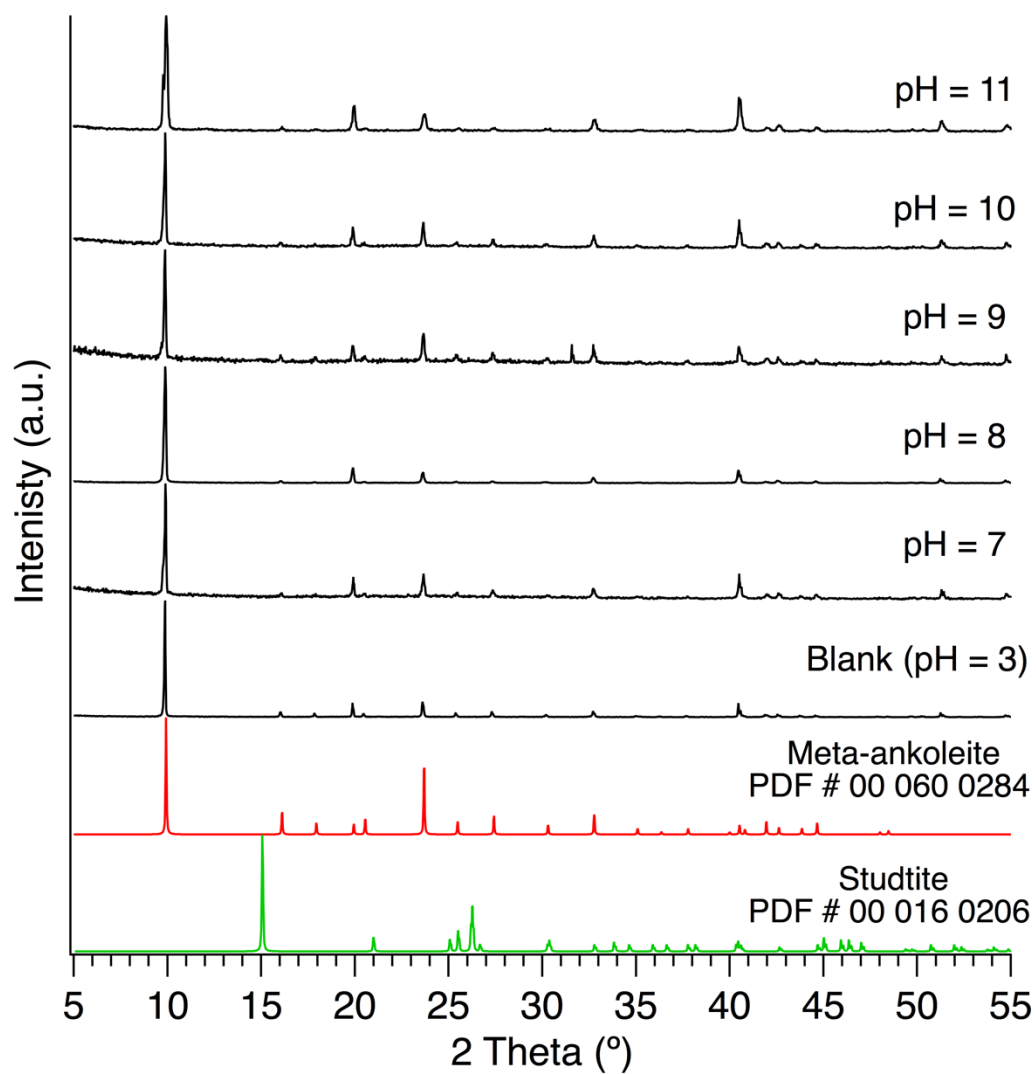


Figure S70. PXRD spectra from solids resulting from mixing KUP with water at pH 7 to 11.

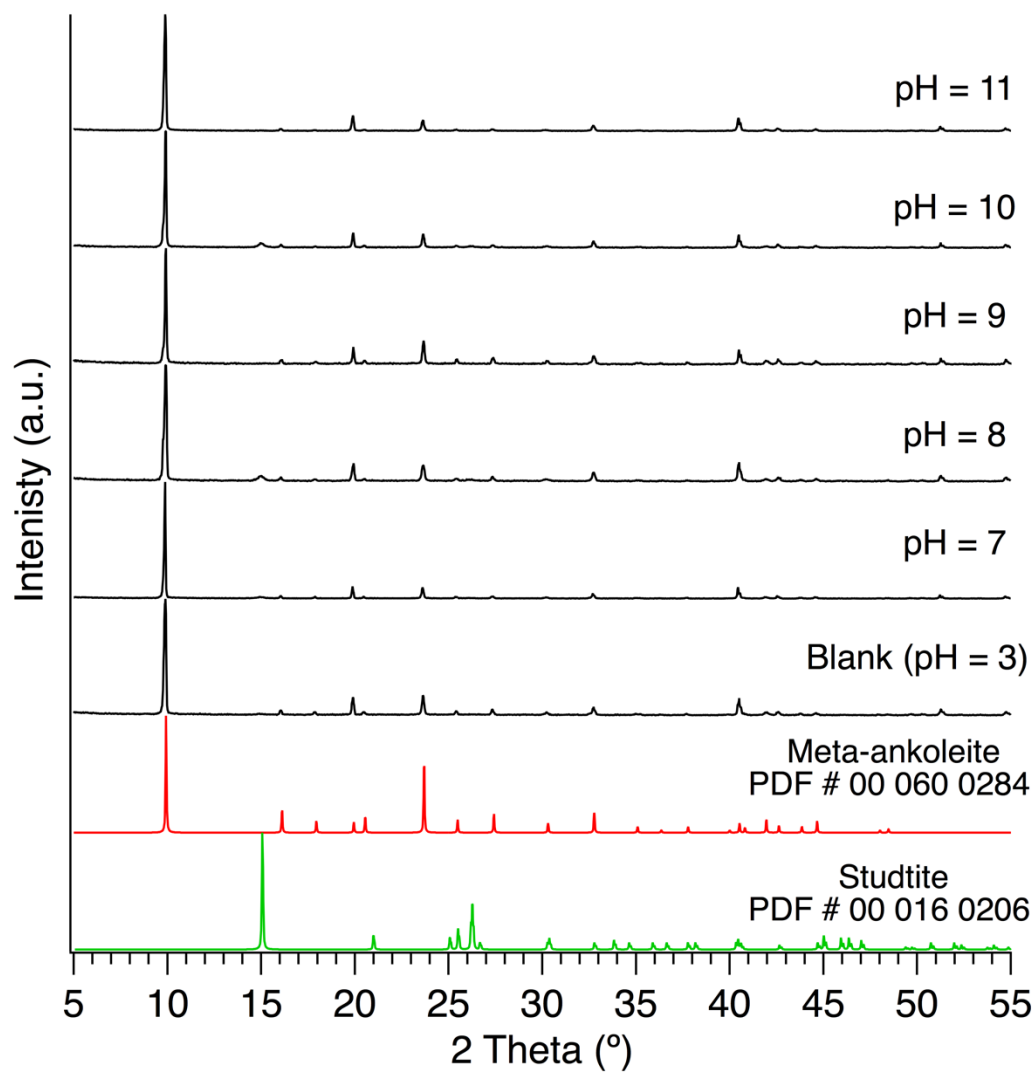


Figure S71. PXRD spectra from solids resulting from mixing KUP with 0.01 M H₂O₂ at pH 7 to 11.

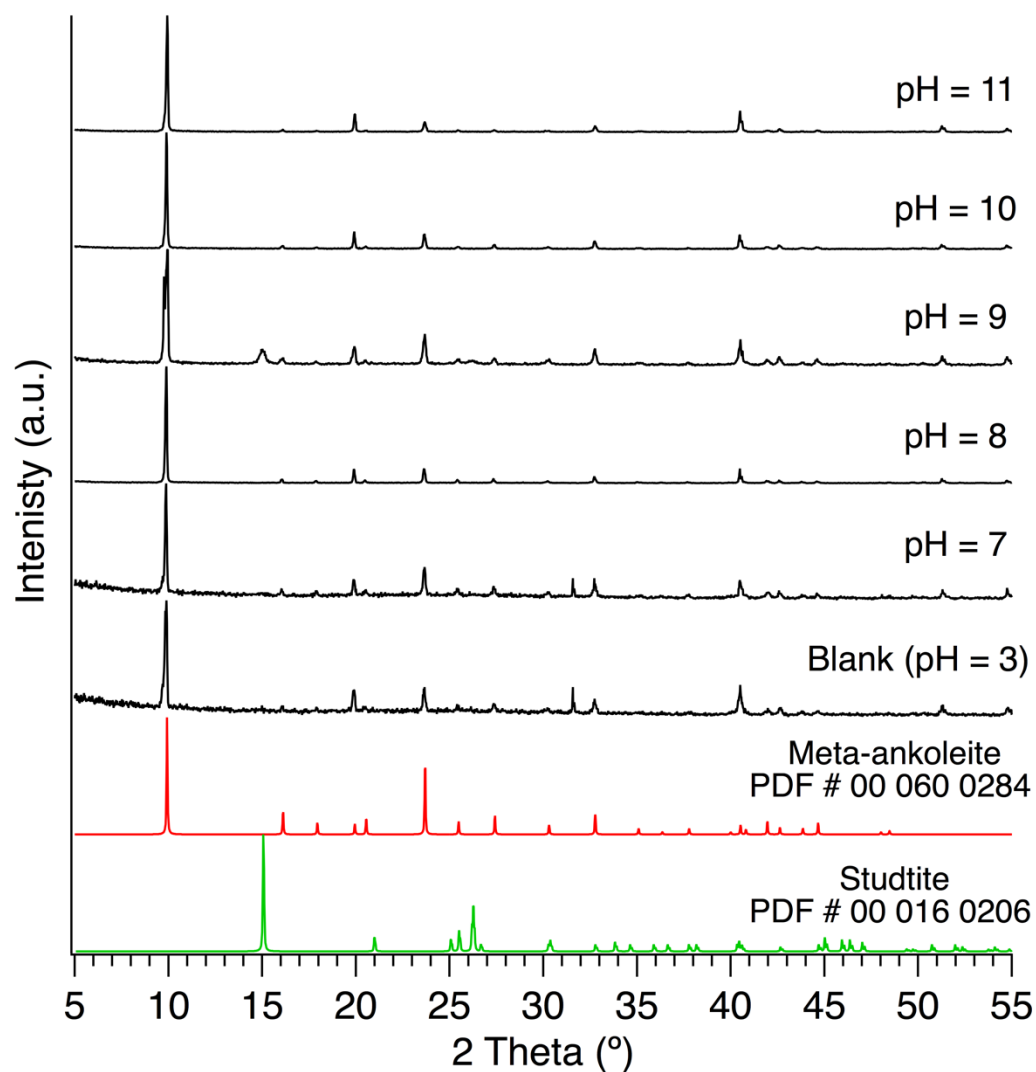


Figure S72. PXRD spectra from solids resulting from mixing KUP with 0.035 M H₂O₂ at pH 7 to 11.

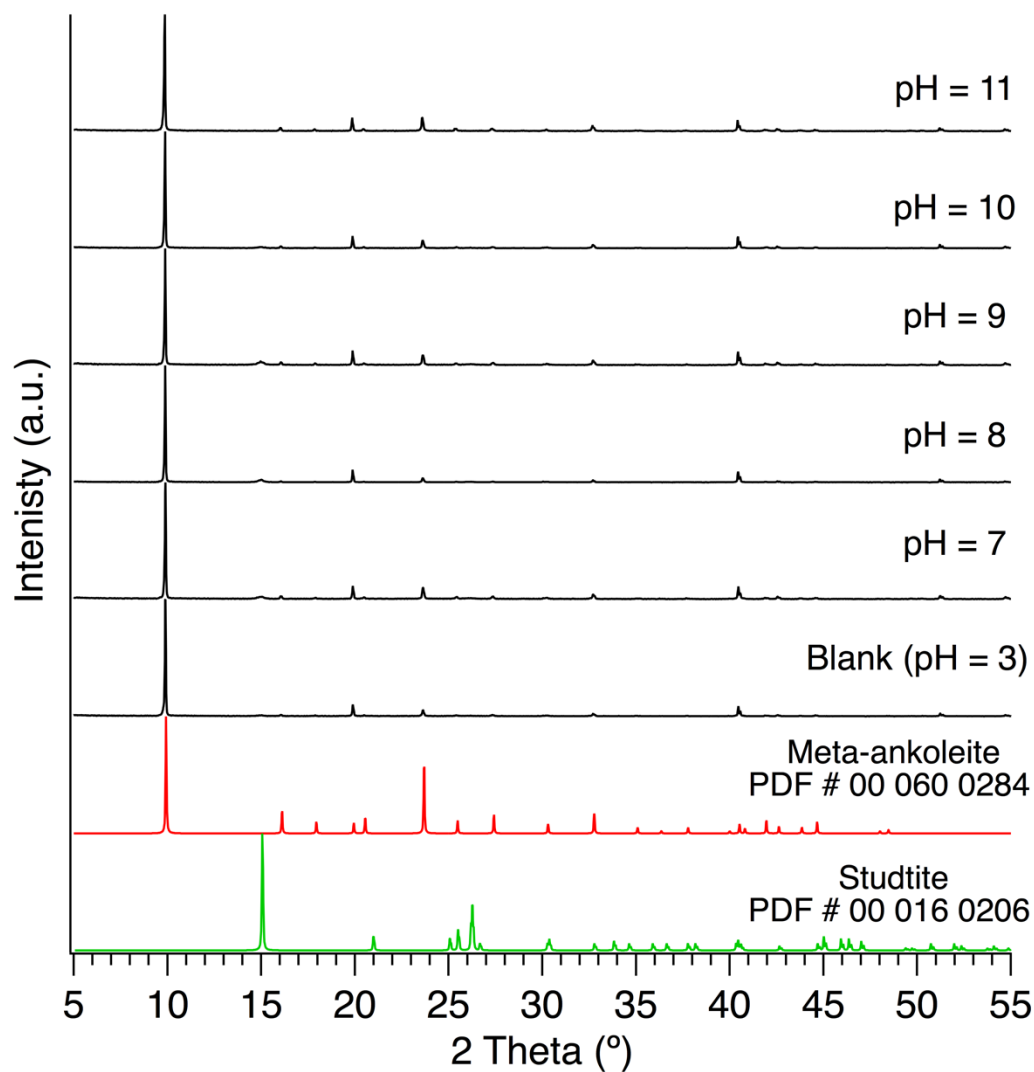


Figure S73. PXRD spectra from solids resulting from mixing KUP with 0.10 M H₂O₂ at pH 7 to 11.

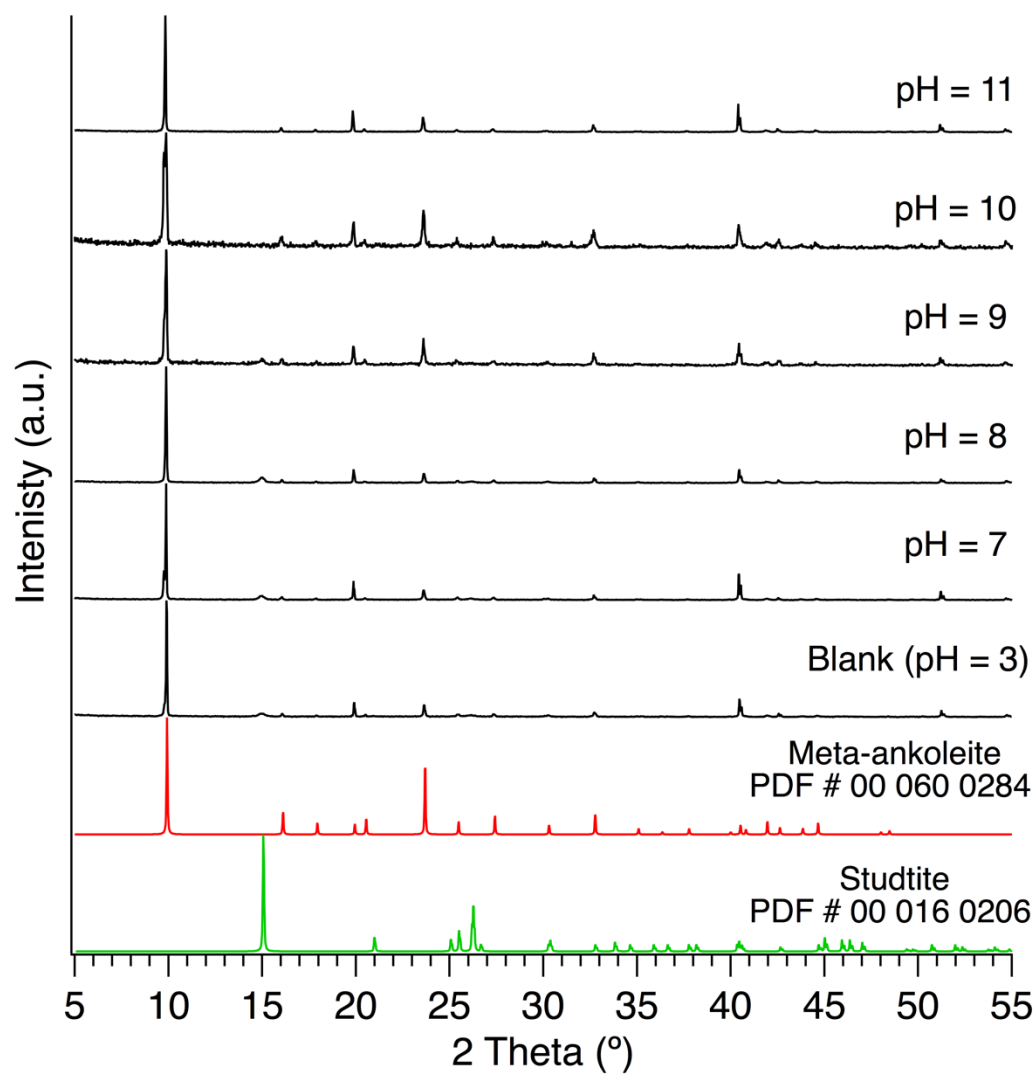


Figure S74. PXRD spectra from solids resulting from mixing KUP with 0.50 M H_2O_2 at pH 7 to 11.

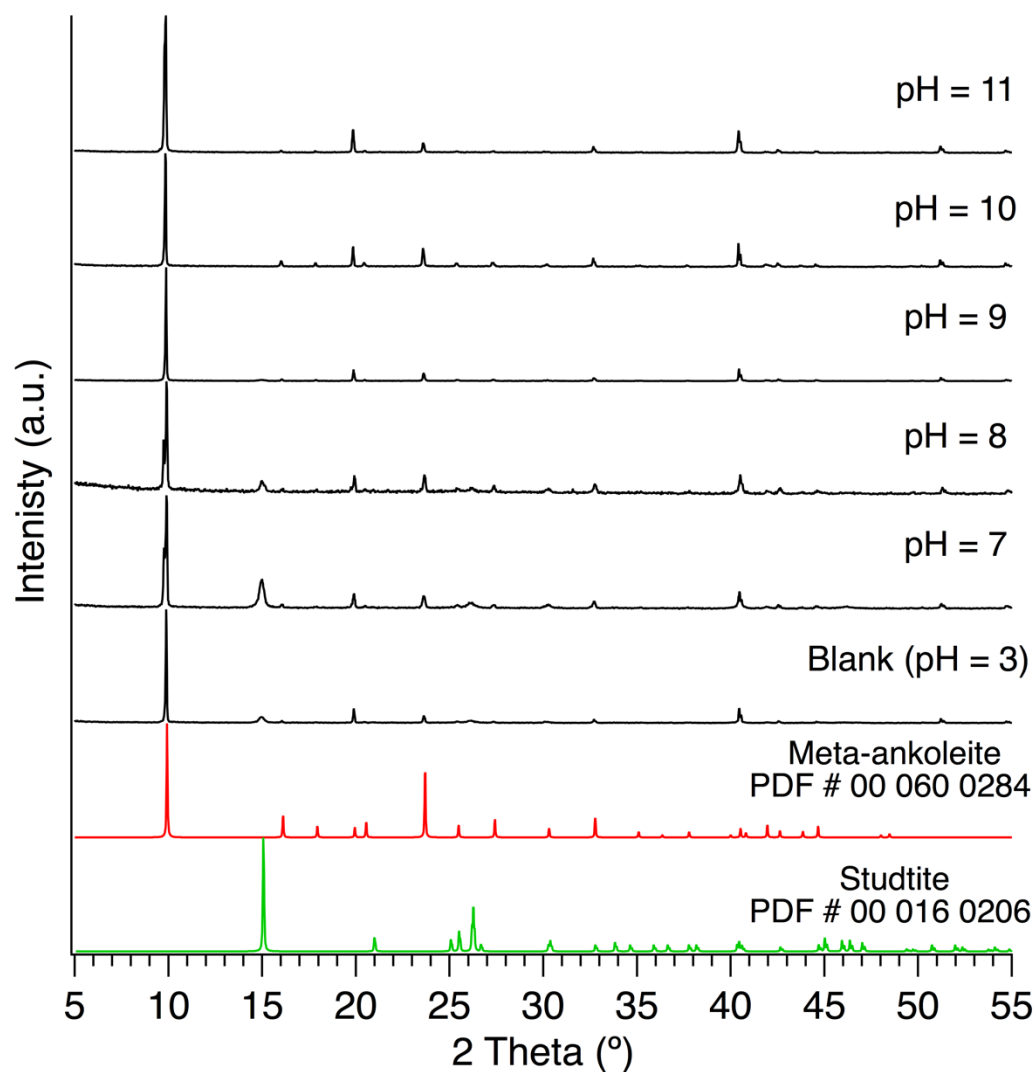


Figure S75. PXRD spectra from solids resulting from mixing KUP with 1.0 M H₂O₂ at pH 7 to 11.

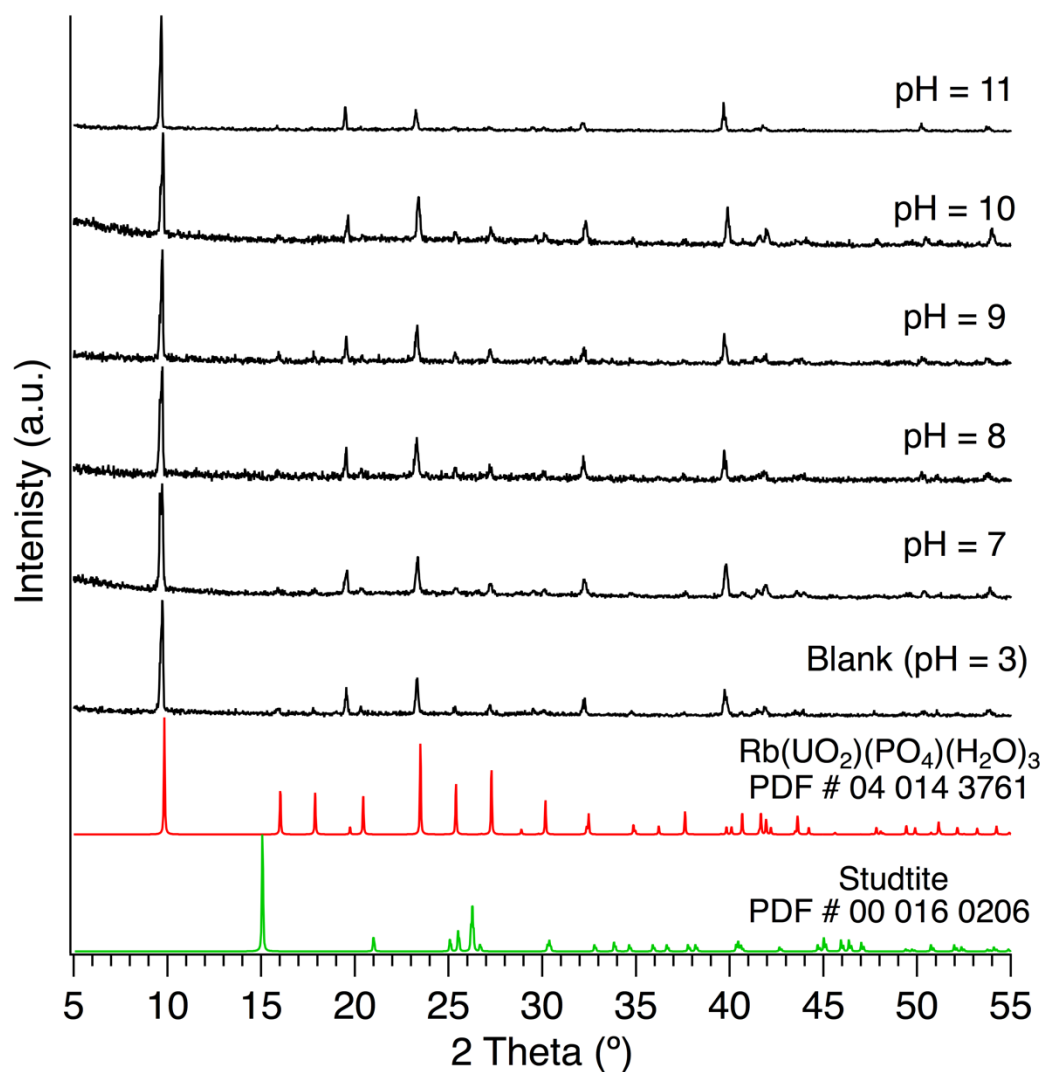


Figure S76. PXRD spectra from solids resulting from mixing RbUP with water at pH 7 to 11.

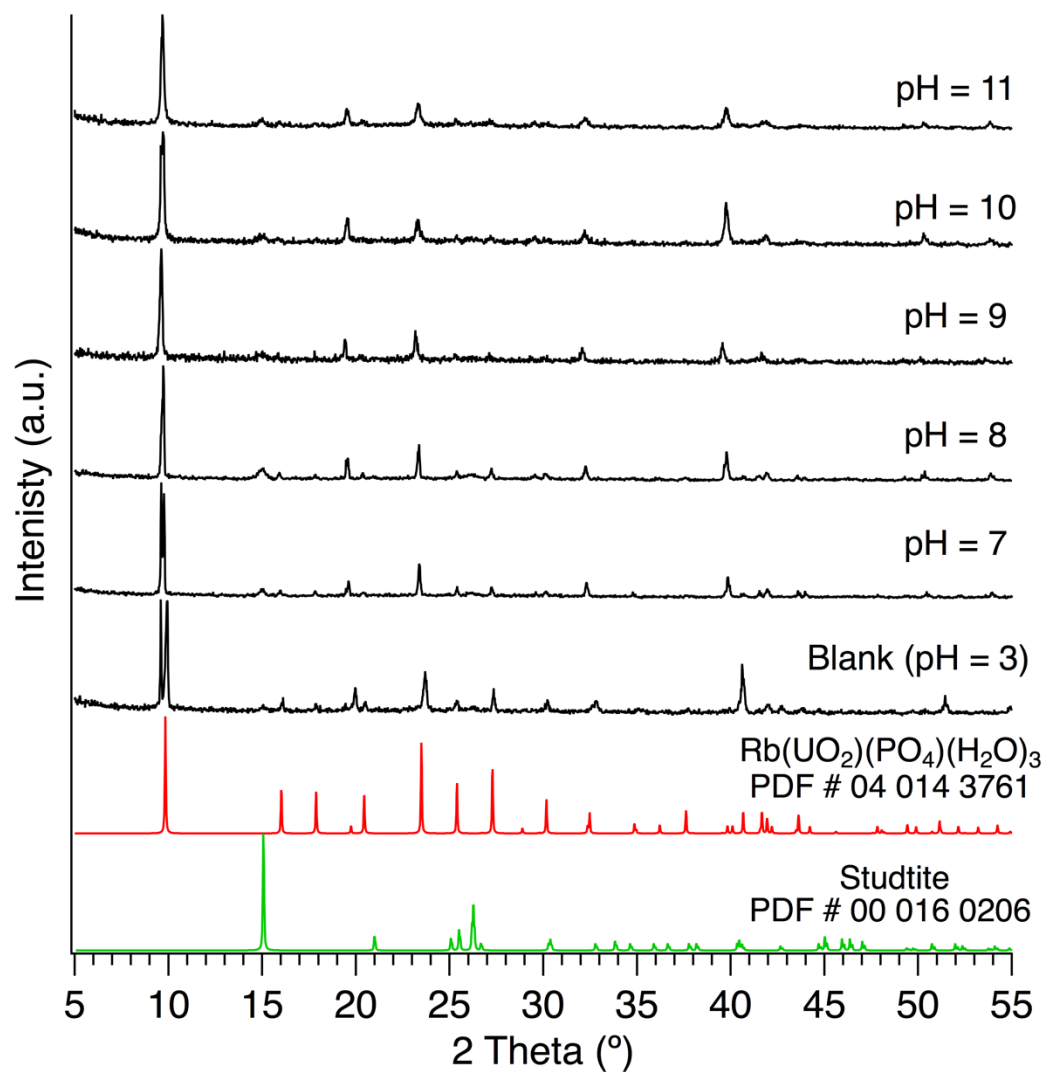


Figure S77. PXRD spectra from solids resulting from mixing RbUP with 0.01 M H_2O_2 at pH 7 to 11.

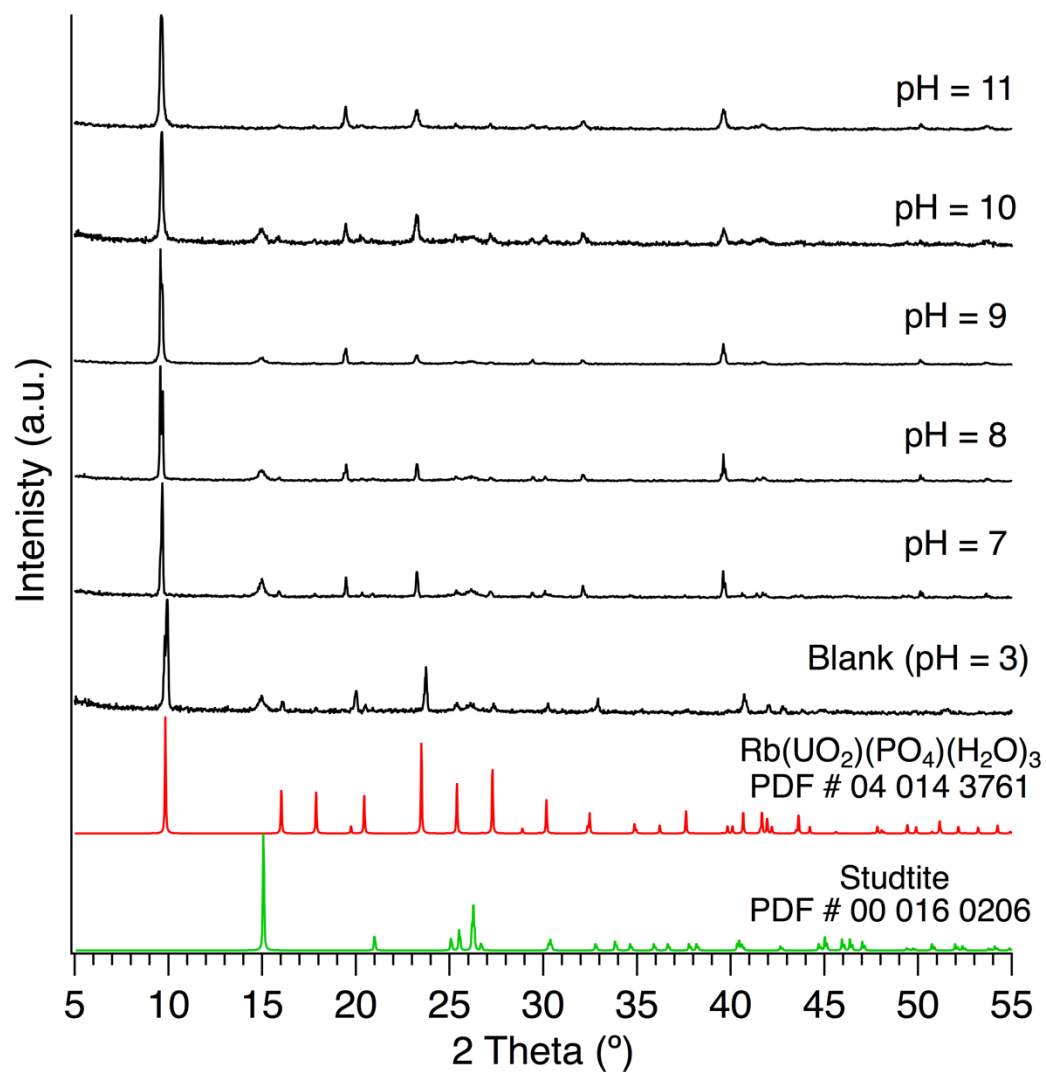


Figure S78. PXRD spectra from solids resulting from mixing RbUP with 0.035 M H₂O₂ at pH 7 to 11.

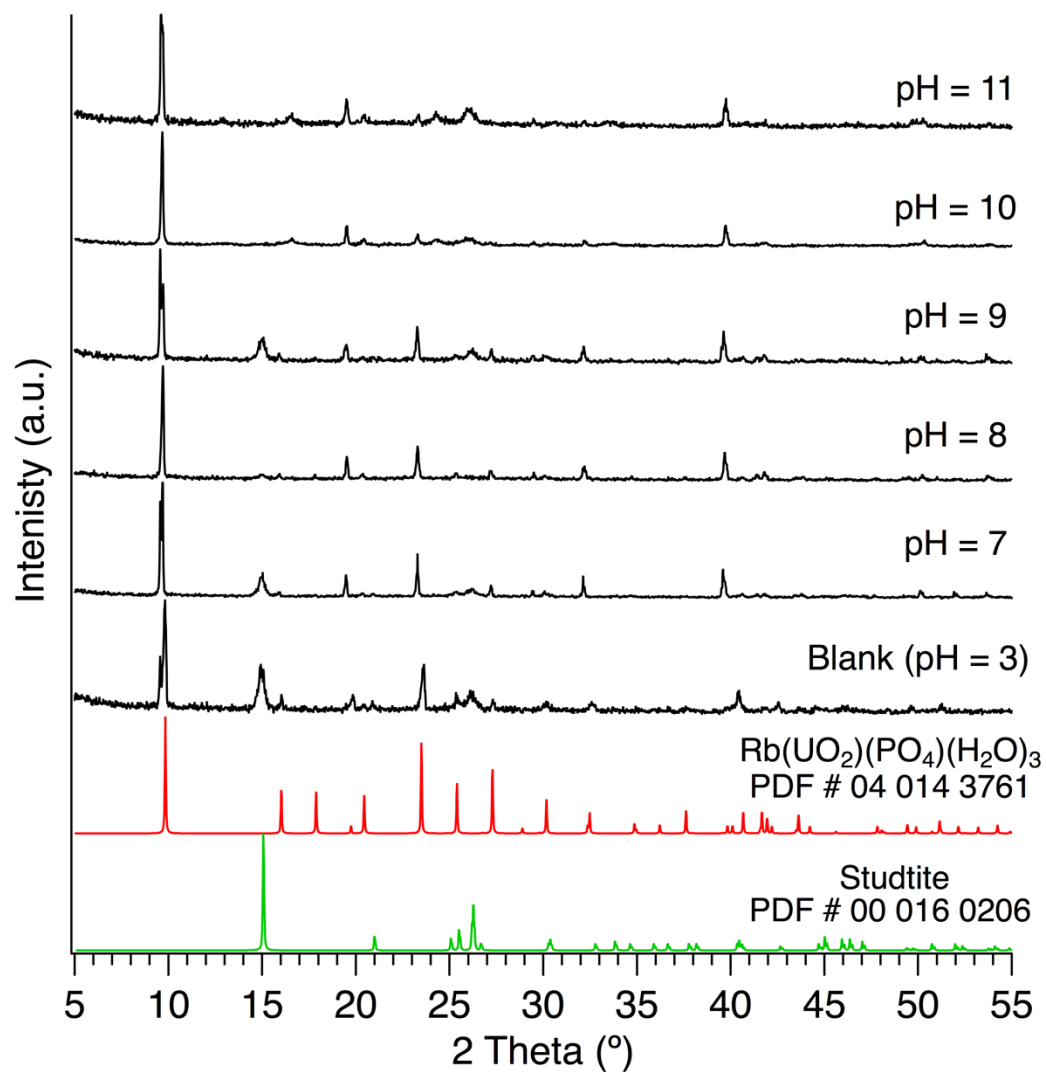


Figure S79. PXRD spectra from solids resulting from mixing RbUP with 0.10 M H₂O₂ at pH 7 to 11.

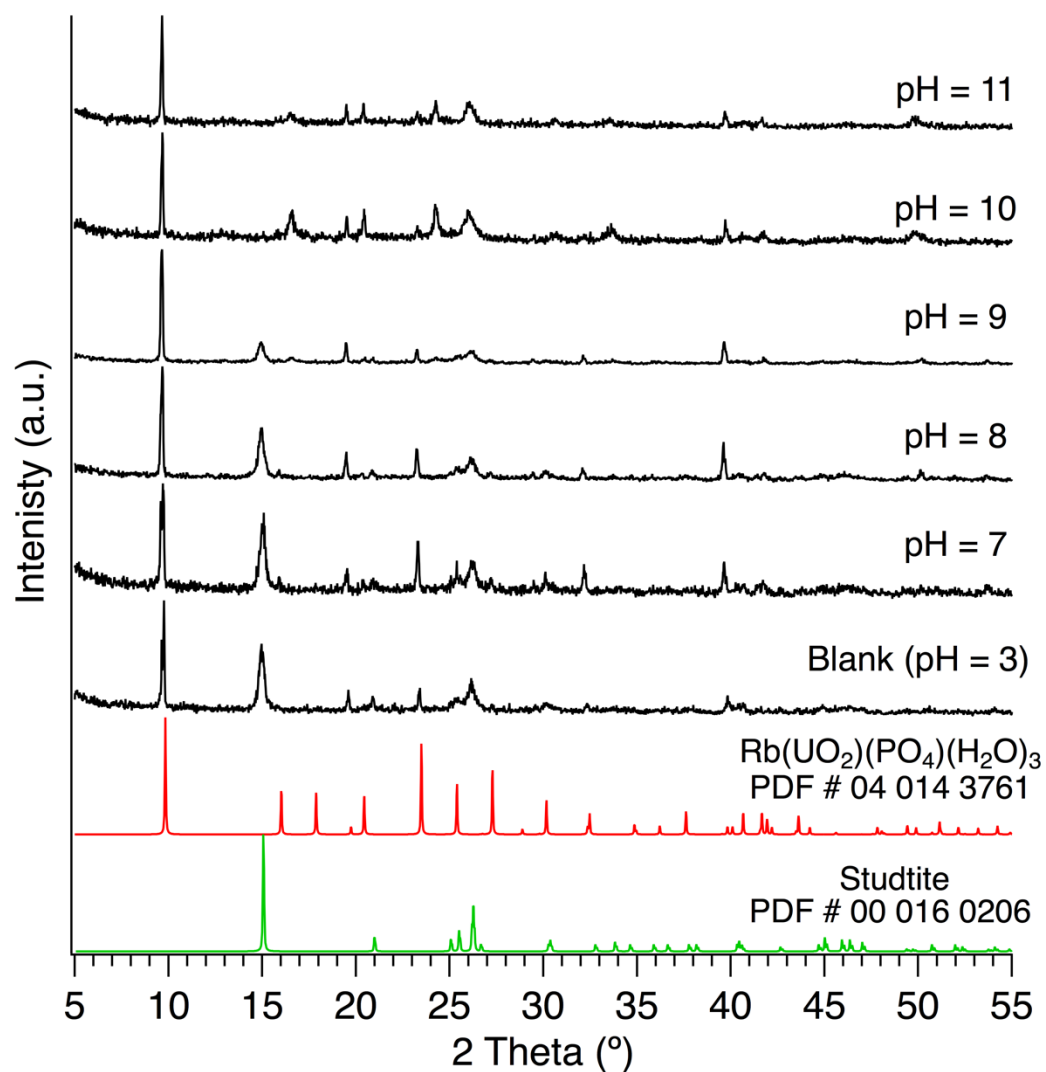


Figure S80. PXRD spectra from solids resulting from mixing RbUP with 0.50 M H_2O_2 at pH 7 to 11.

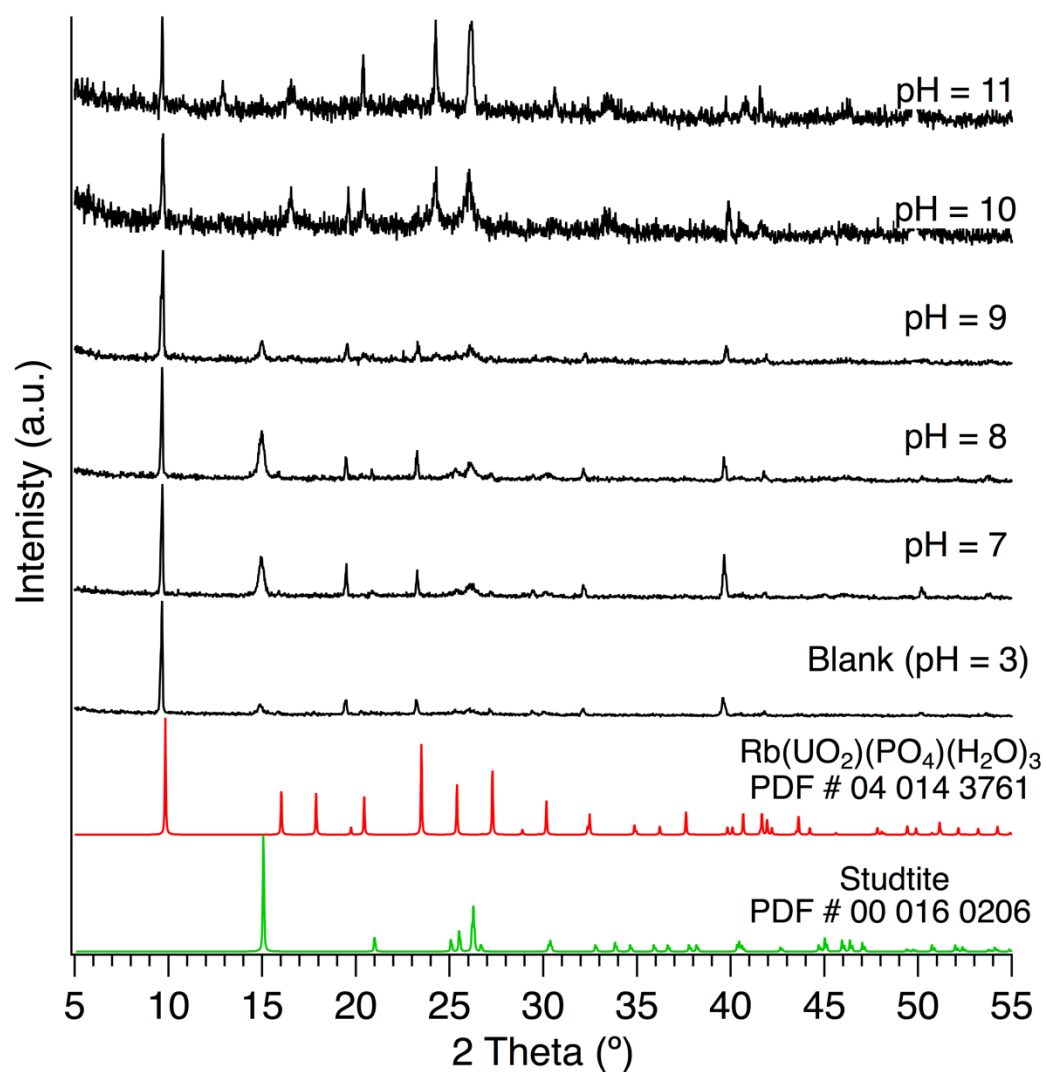


Figure S81. PXRD spectra from solids resulting from mixing RbUP with 1.0 M H₂O₂ at pH 7 to 11.

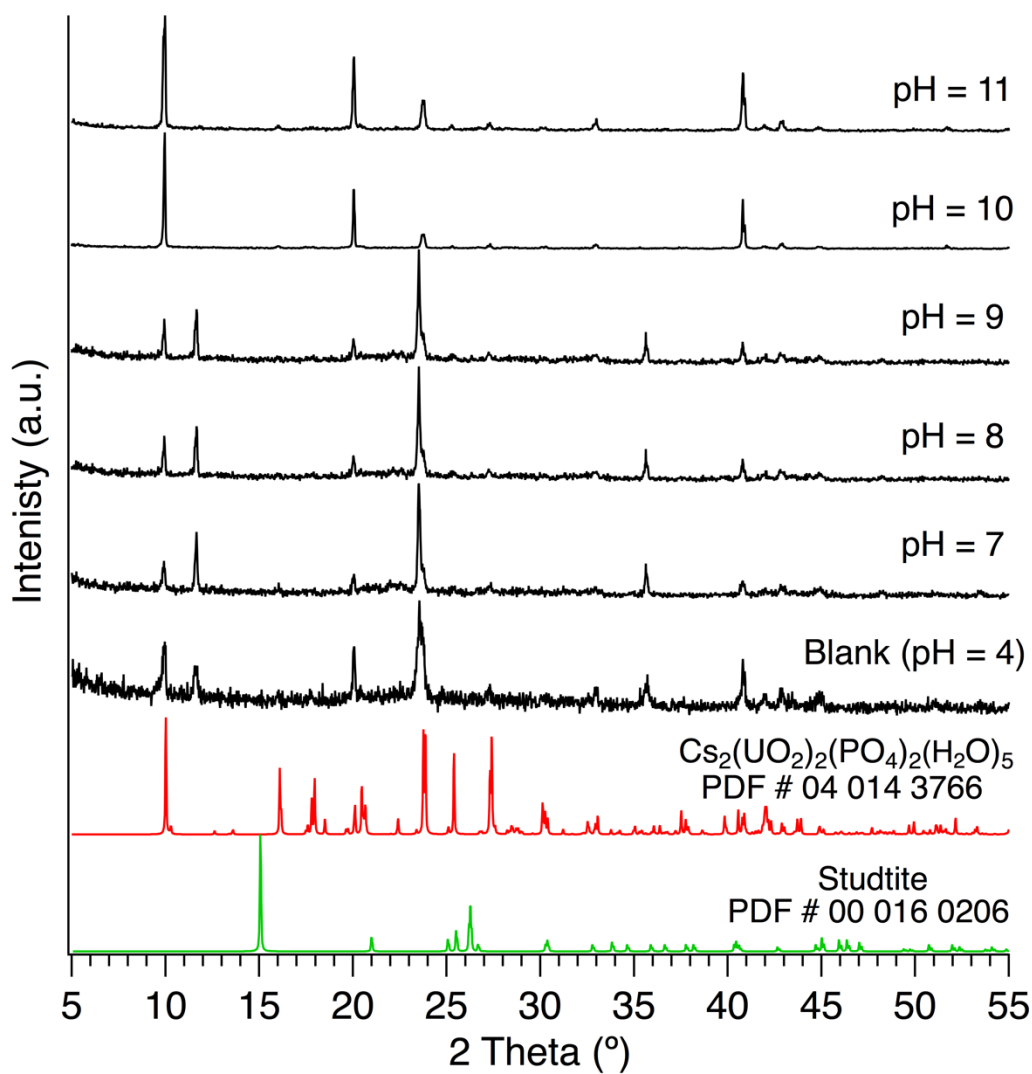


Figure S82. PXRD spectra from solids resulting from mixing CsUP with water at pH 7 to 11

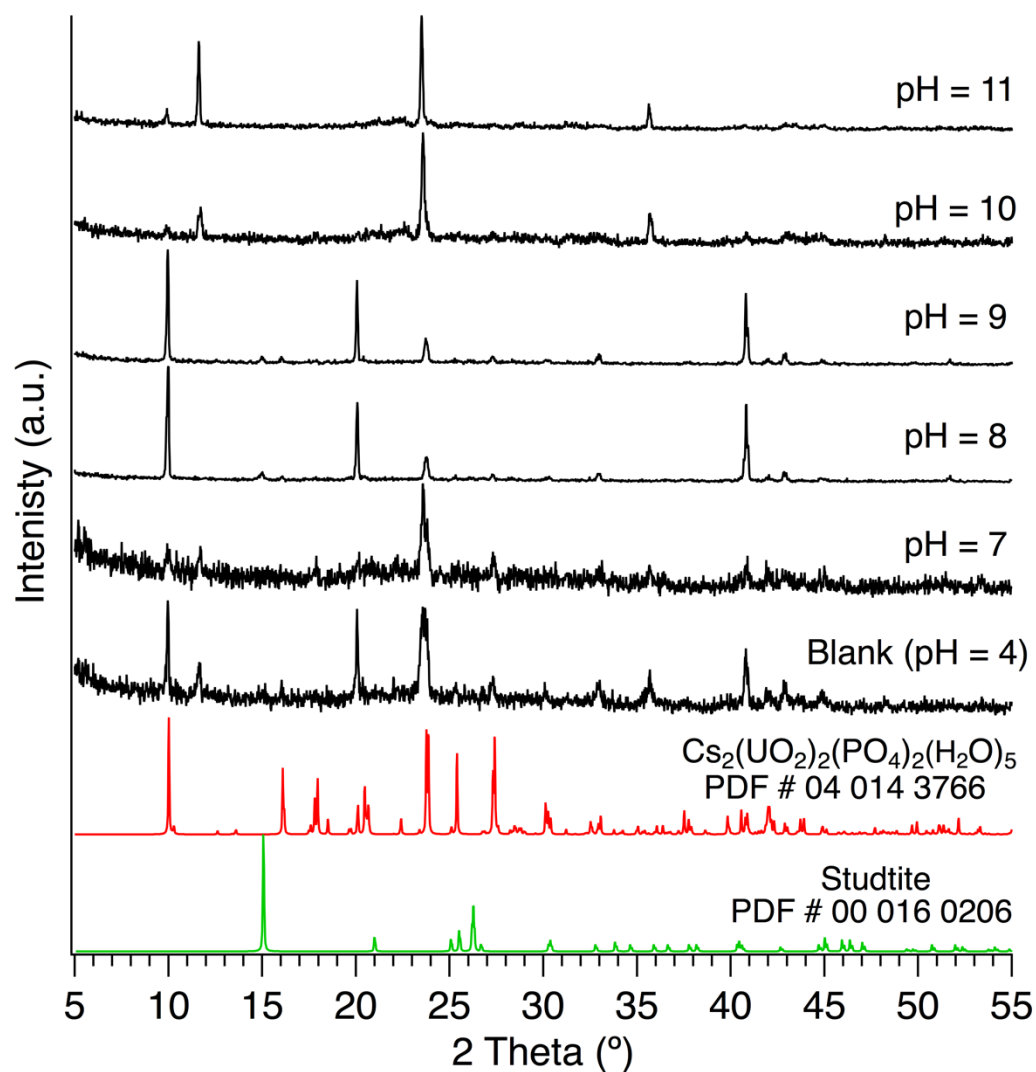


Figure S83. PXRD spectra from solids resulting from mixing CsUP with 0.01 M H_2O_2 at pH 7 to 11.

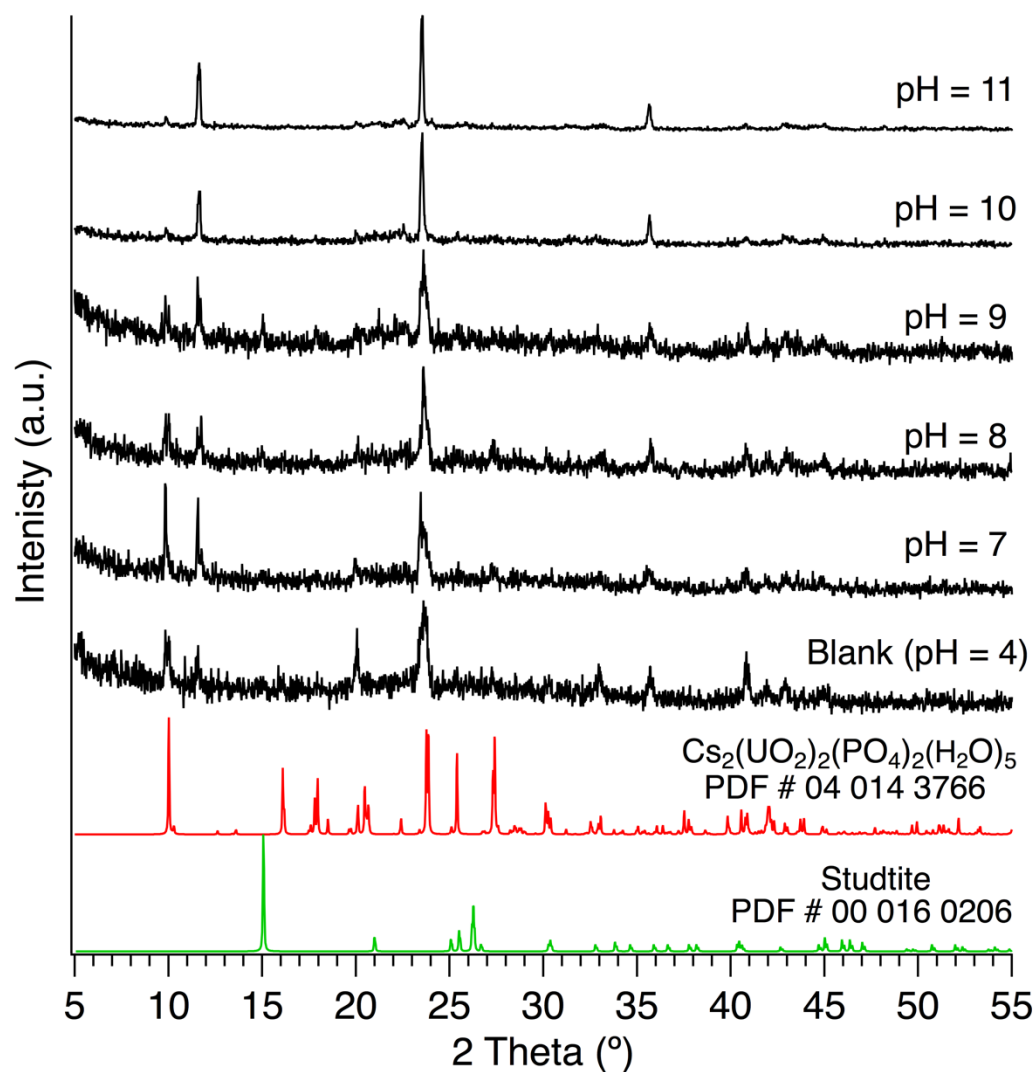


Figure S84. PXRD spectra from solids resulting from mixing CsUP with 0.035 M H_2O_2 at pH 7 to 11.

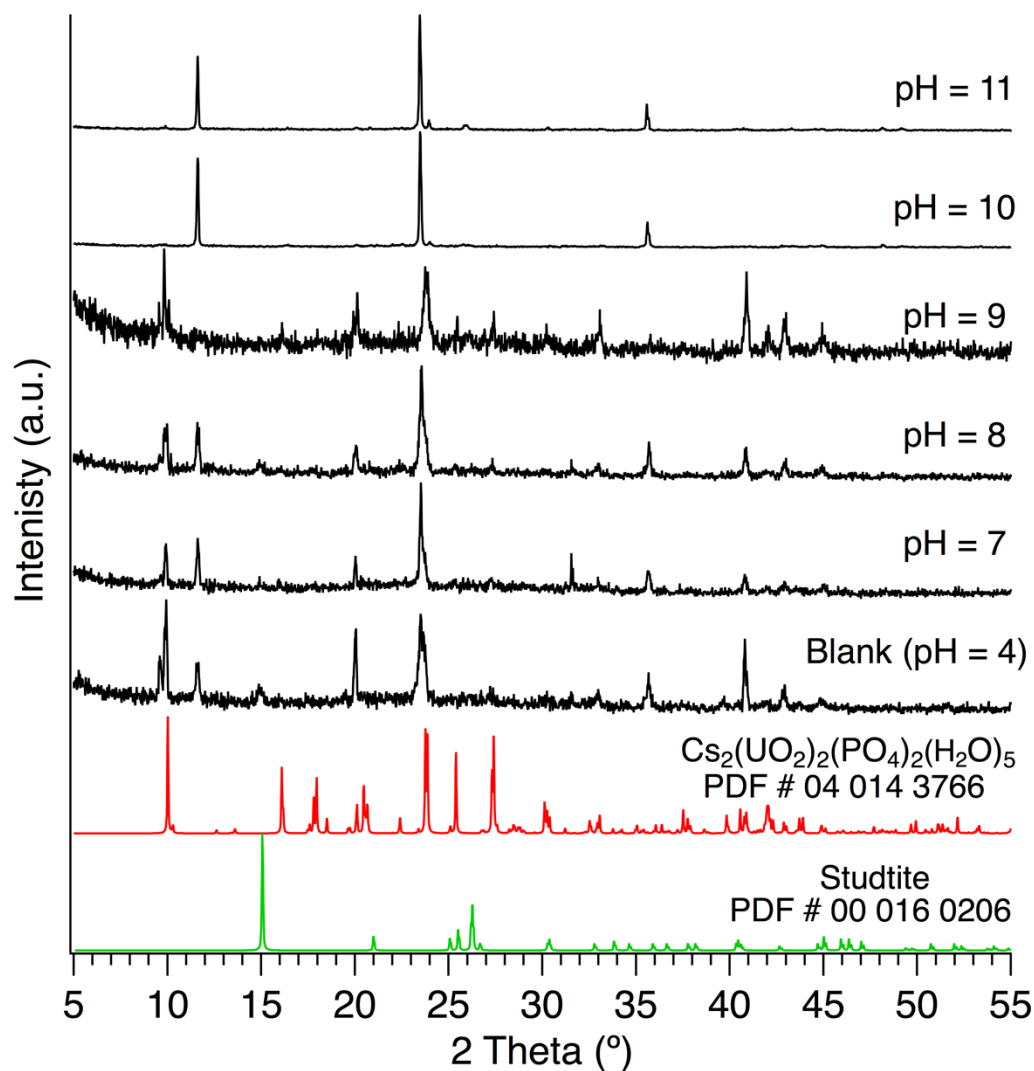


Figure S85. PXRD spectra from solids resulting from mixing CsUP with 0.10 M H_2O_2 at pH 7 to 11.

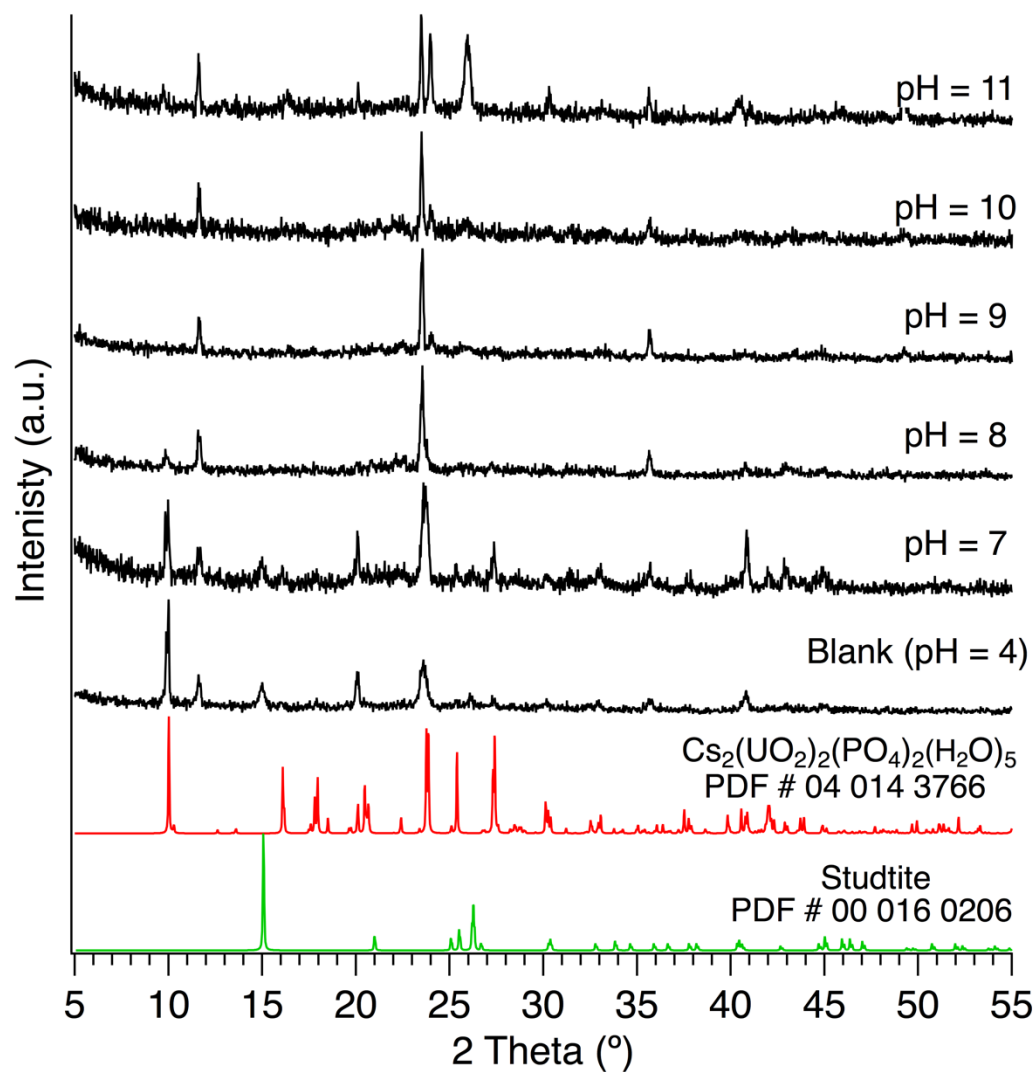


Figure S86. PXRD spectra from solids resulting from mixing CsUP with 0.50 M H_2O_2 at pH 7 to 11.

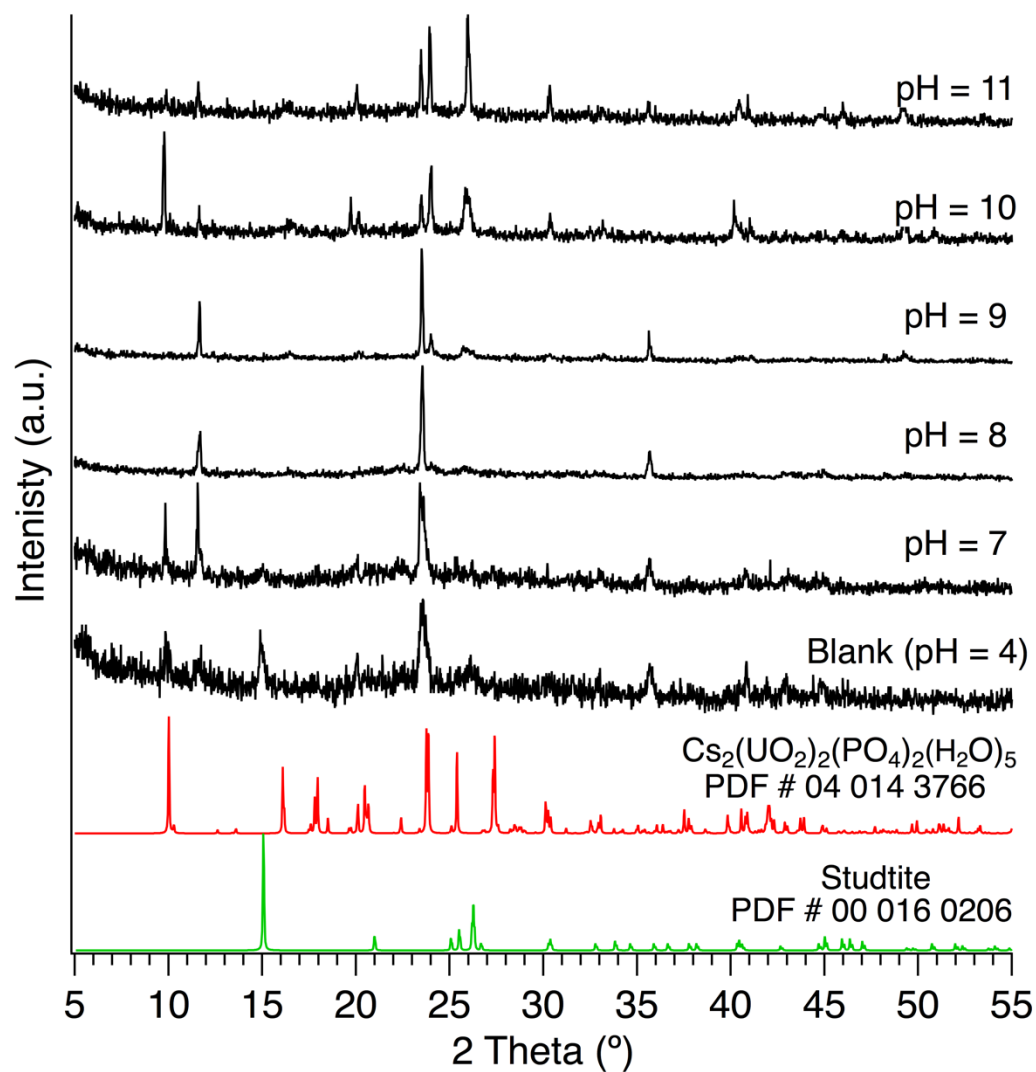


Figure S87. PXRD spectra from solids resulting from mixing CsUP with 1.0 M H_2O_2 at pH 7 to 11.

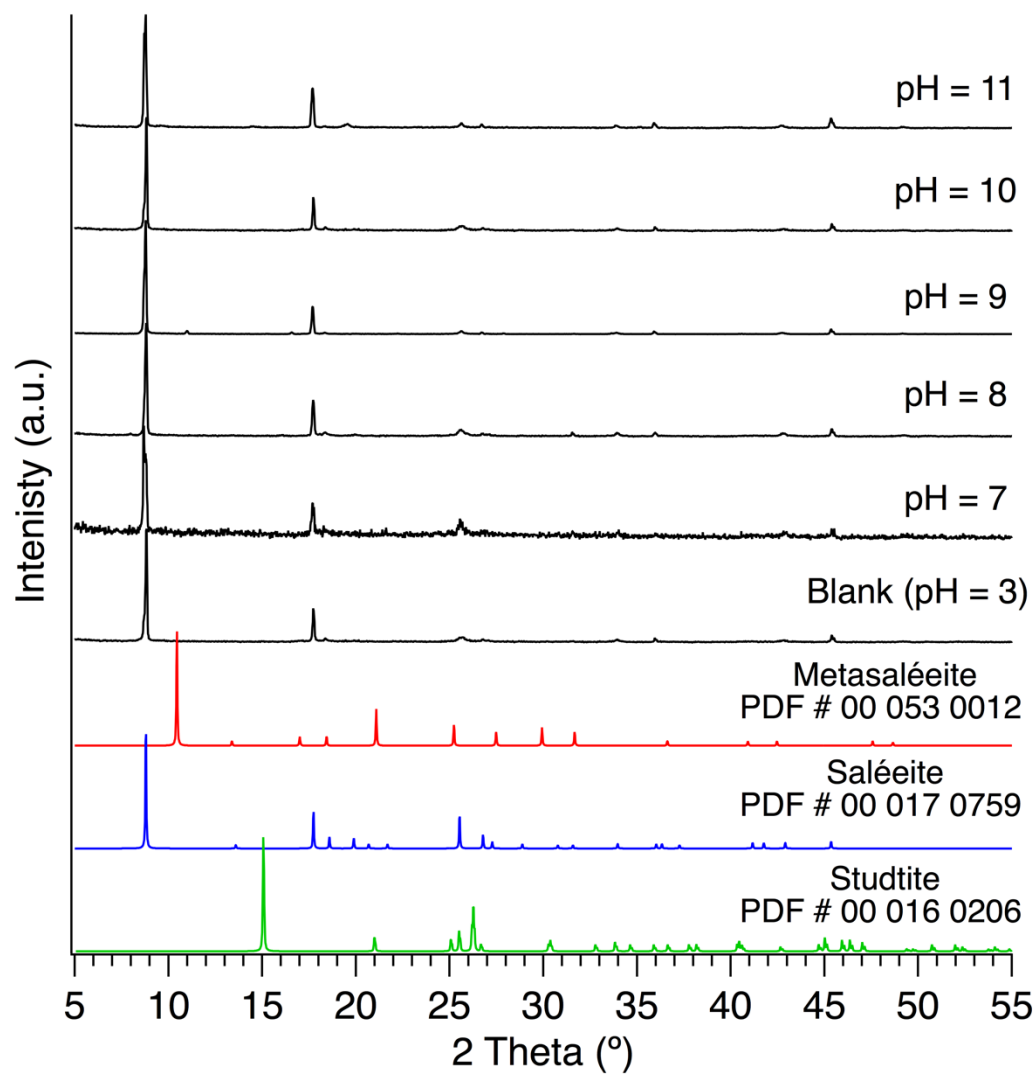


Figure S88. PXRD spectra from solids resulting from mixing MgUP with water at pH 7 to 11.

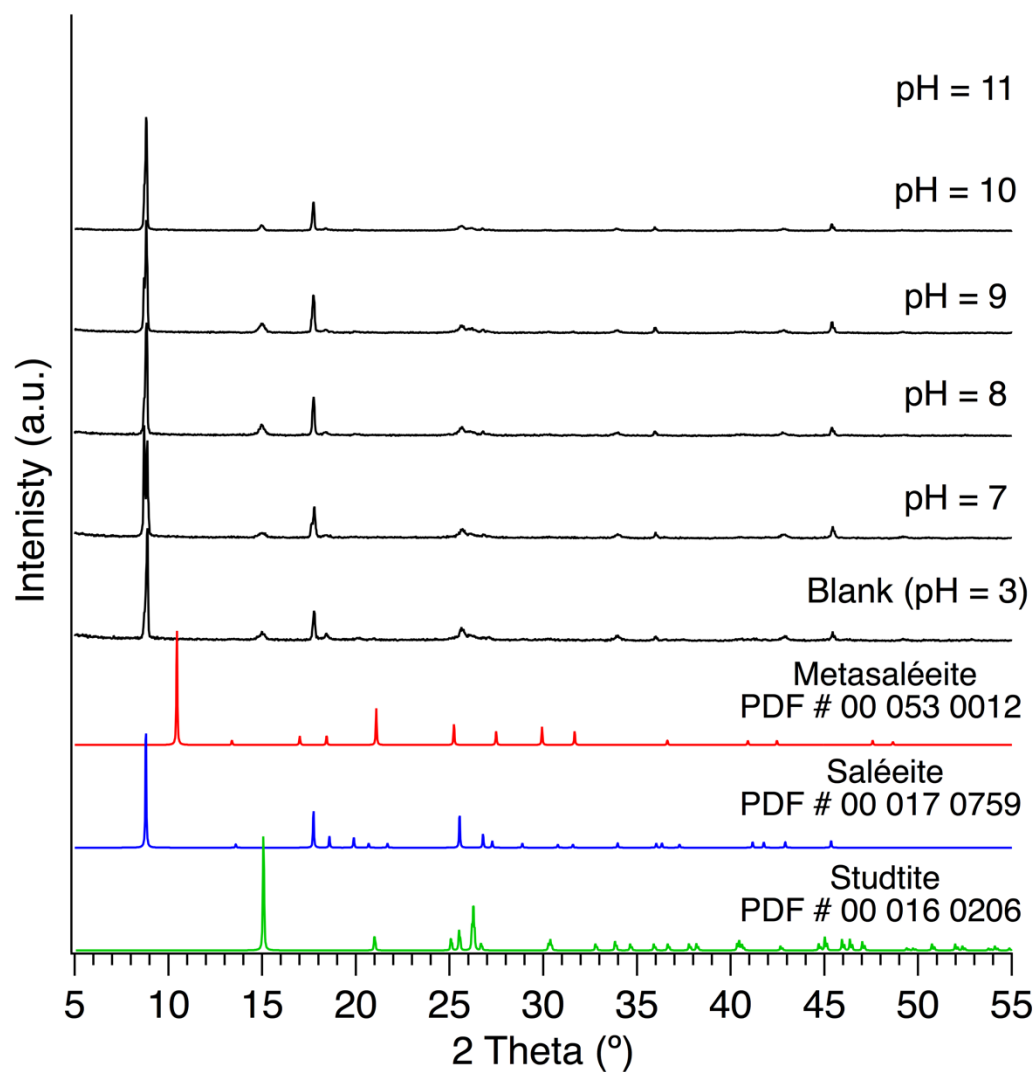


Figure S89. PXRD spectra from solids resulting from mixing MgUP with 0.01 M H₂O₂ at pH 7 to 11.

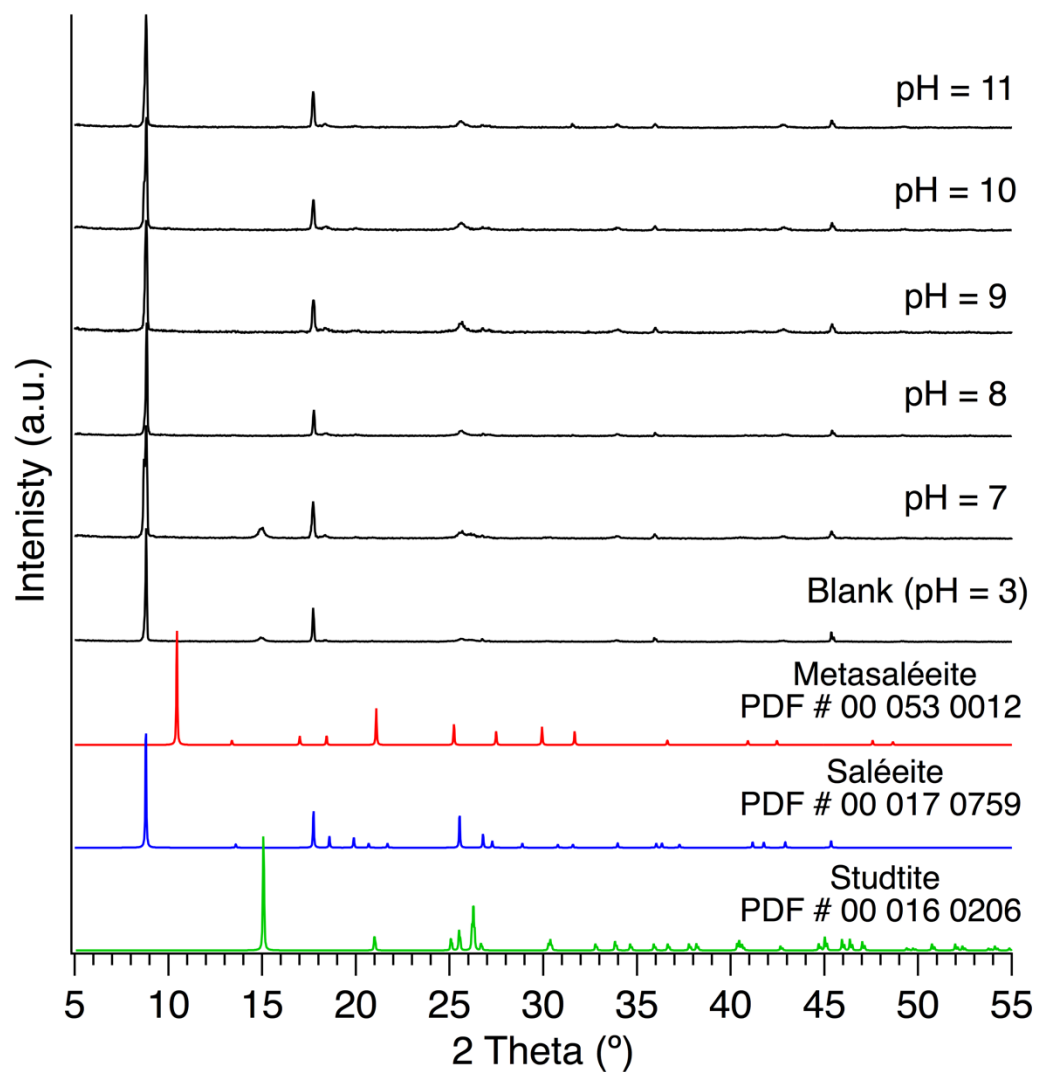


Figure S90. PXRD spectra from solids resulting from mixing MgUP with 0.035 M H₂O₂ at pH 7 to 11.

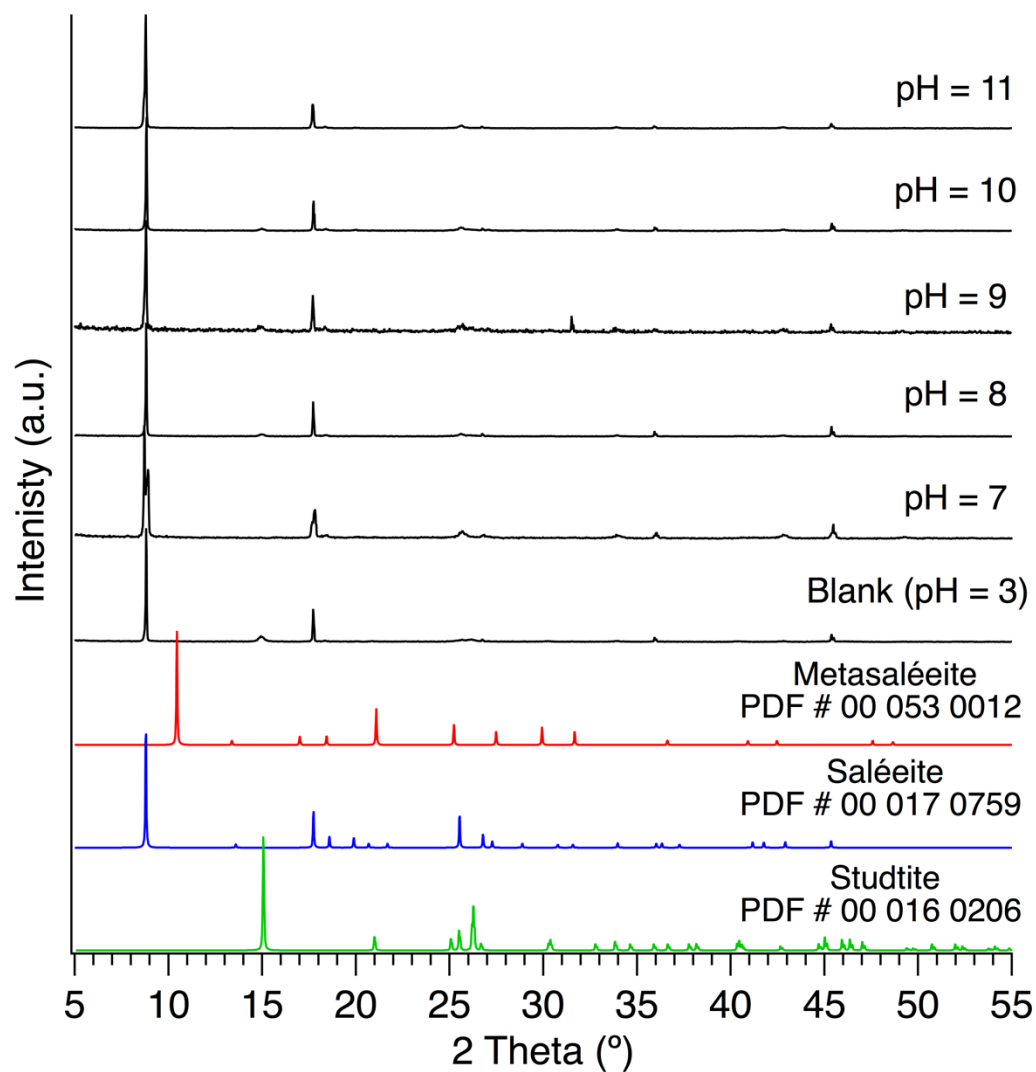


Figure S91. PXRD spectra from solids resulting from mixing MgUP with 0.10 M H₂O₂ at pH 7 to 11.

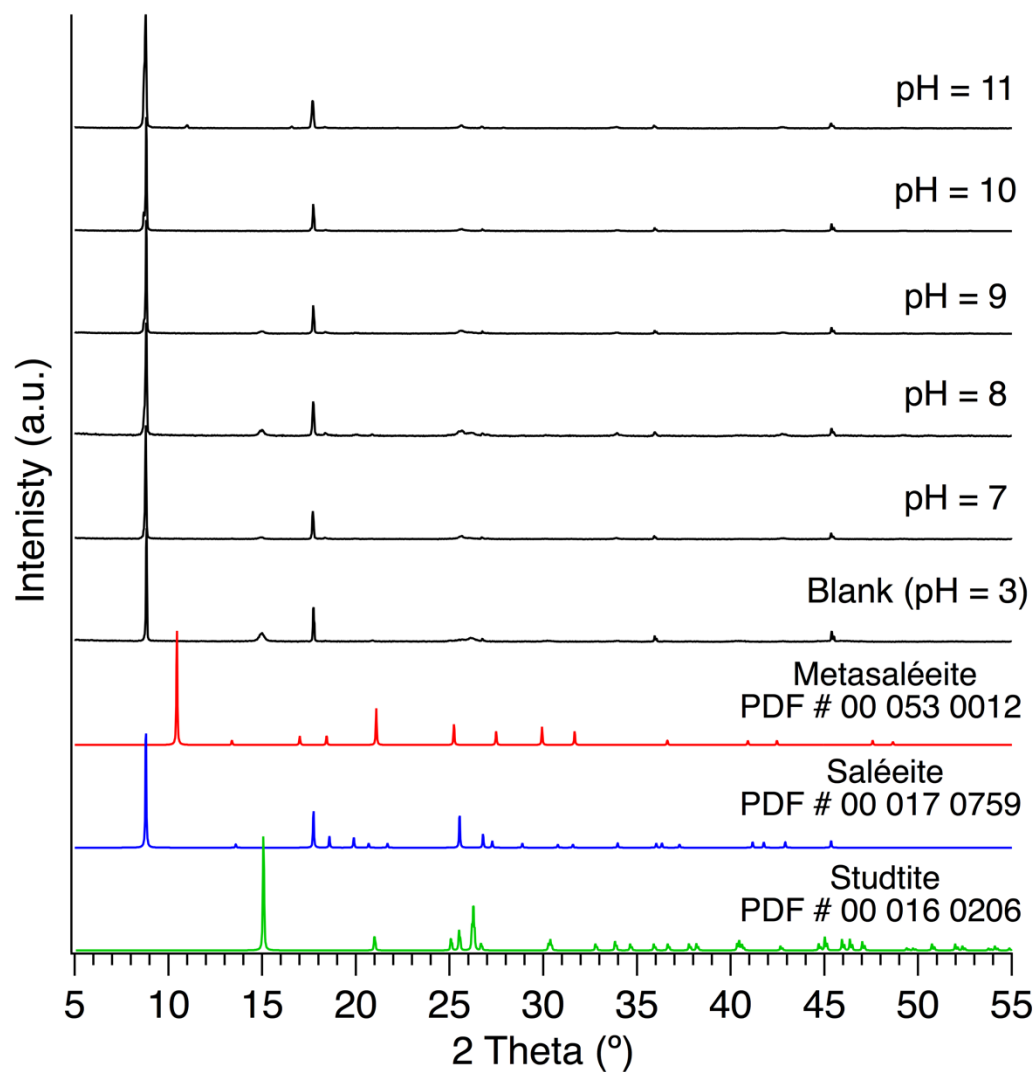


Figure S92. PXRD spectra from solids resulting from mixing MgUP with 0.50 M H₂O₂ at pH 7 to 11.

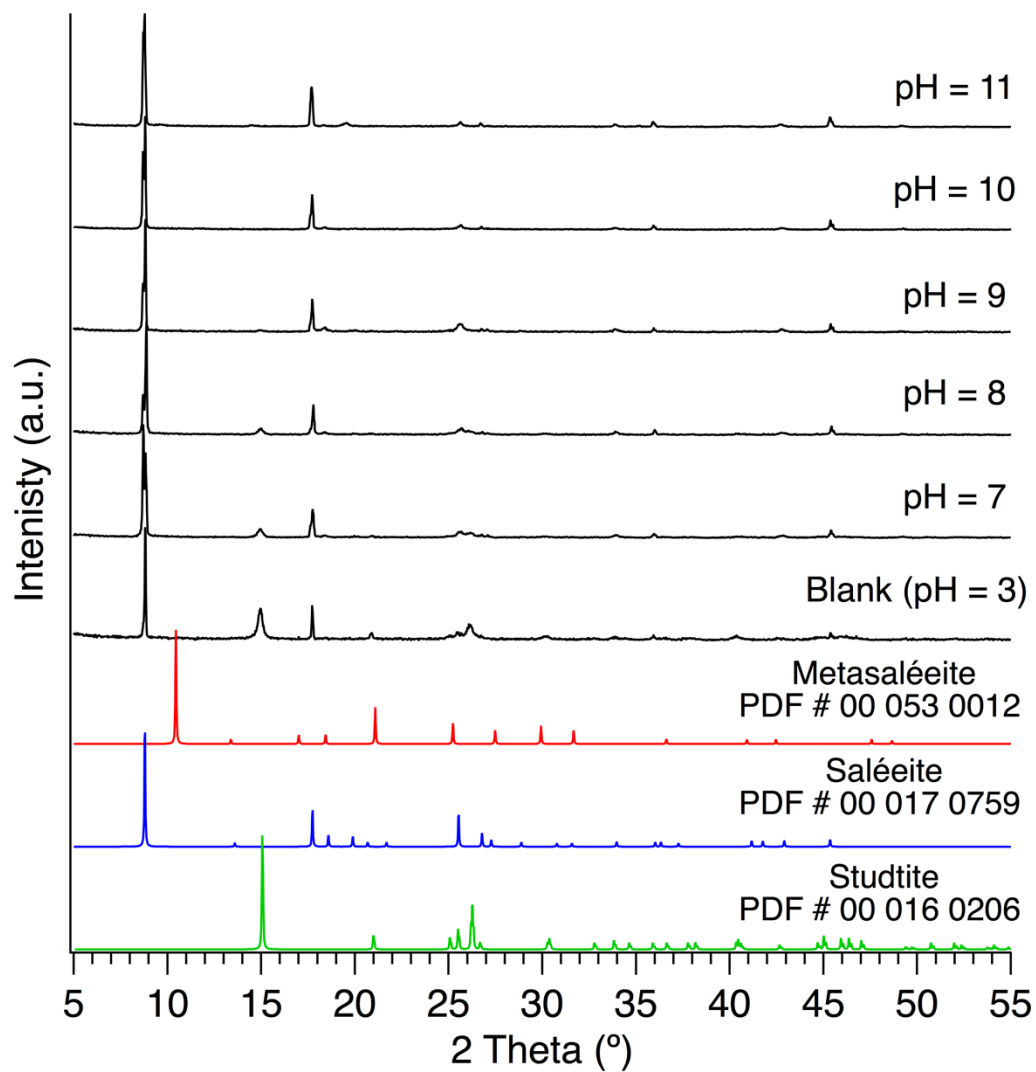


Figure S93. PXRD spectra from solids resulting from mixing MgUP with 1.0 M H₂O₂ at pH 7 to 11.

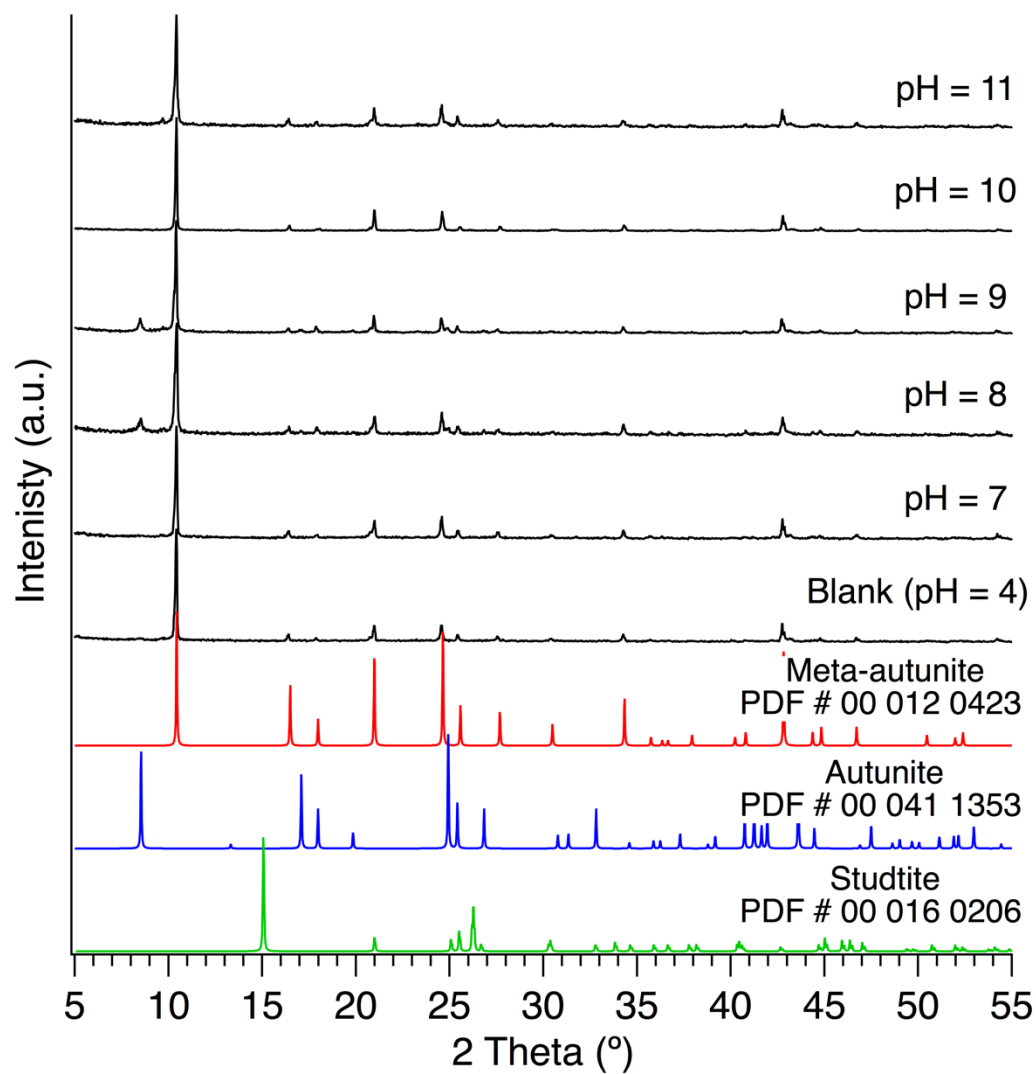


Figure S94. PXRD spectra from solids resulting from mixing CaUP with water at pH 7 to 11.

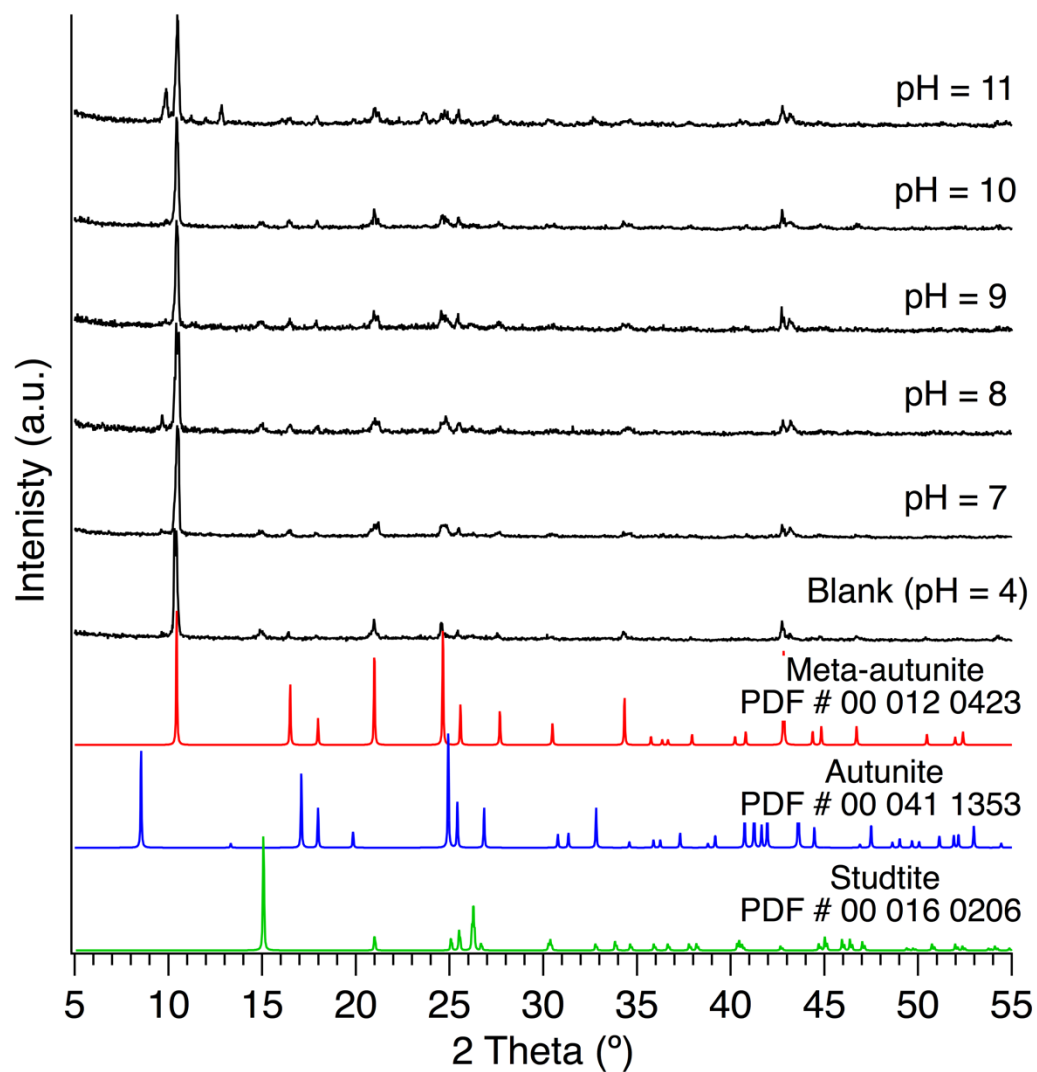


Figure S95. PXRD spectra from solids resulting from mixing CaUP with 0.01 M H₂O₂ at pH 7 to 11.

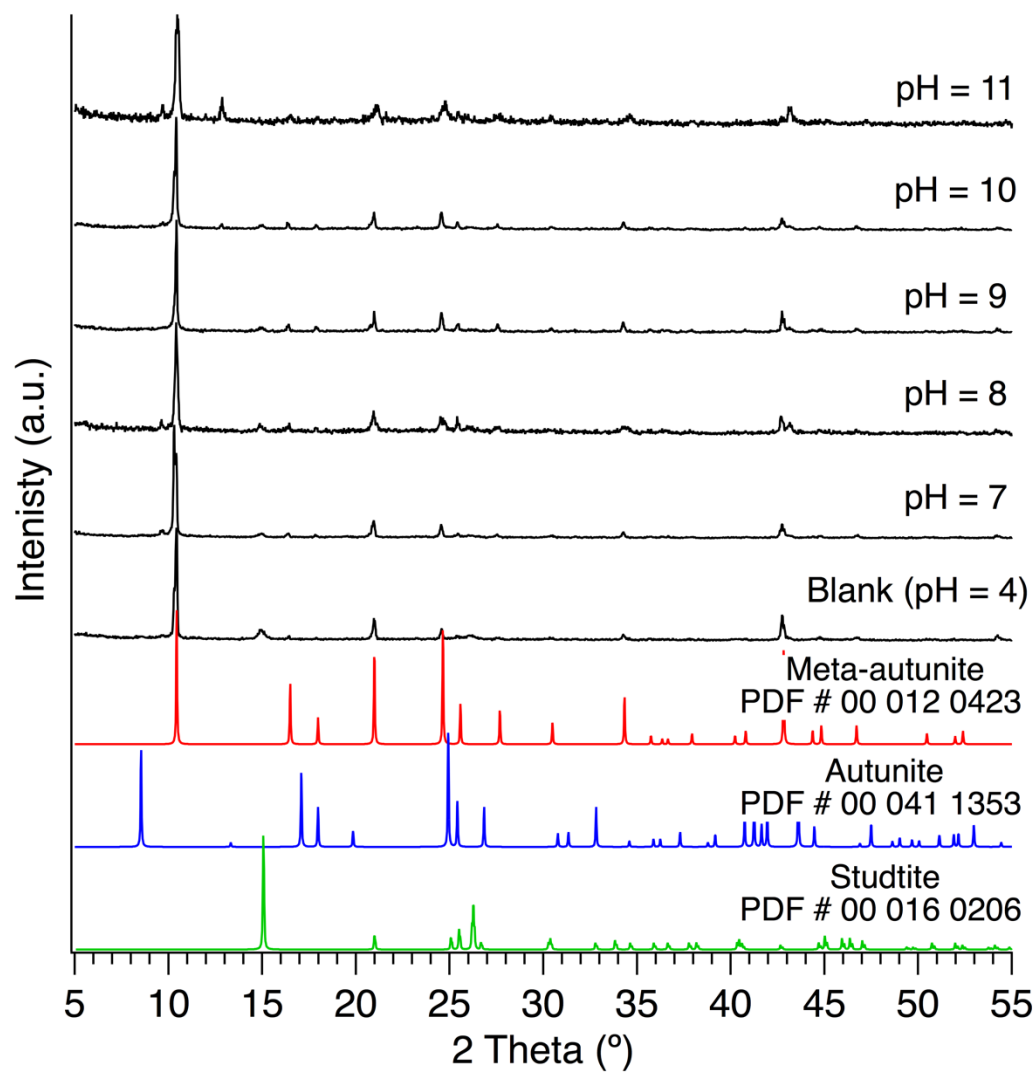


Figure S96. PXRD spectra from solids resulting from mixing CaUP with 0.035 M H₂O₂ at pH 7 to 11.

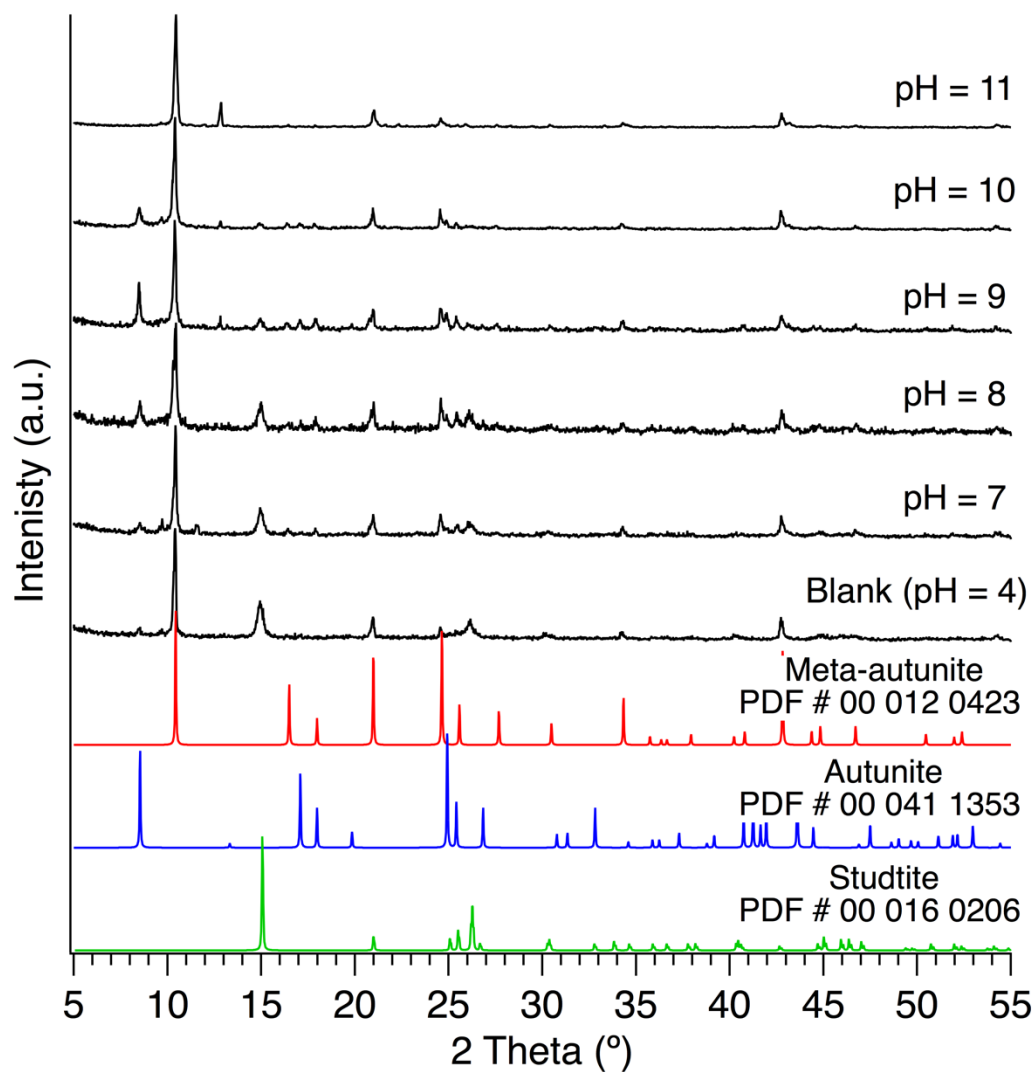


Figure S97. PXRD spectra from solids resulting from mixing CaUP with 0.10 M H₂O₂ at pH 7 to 11.

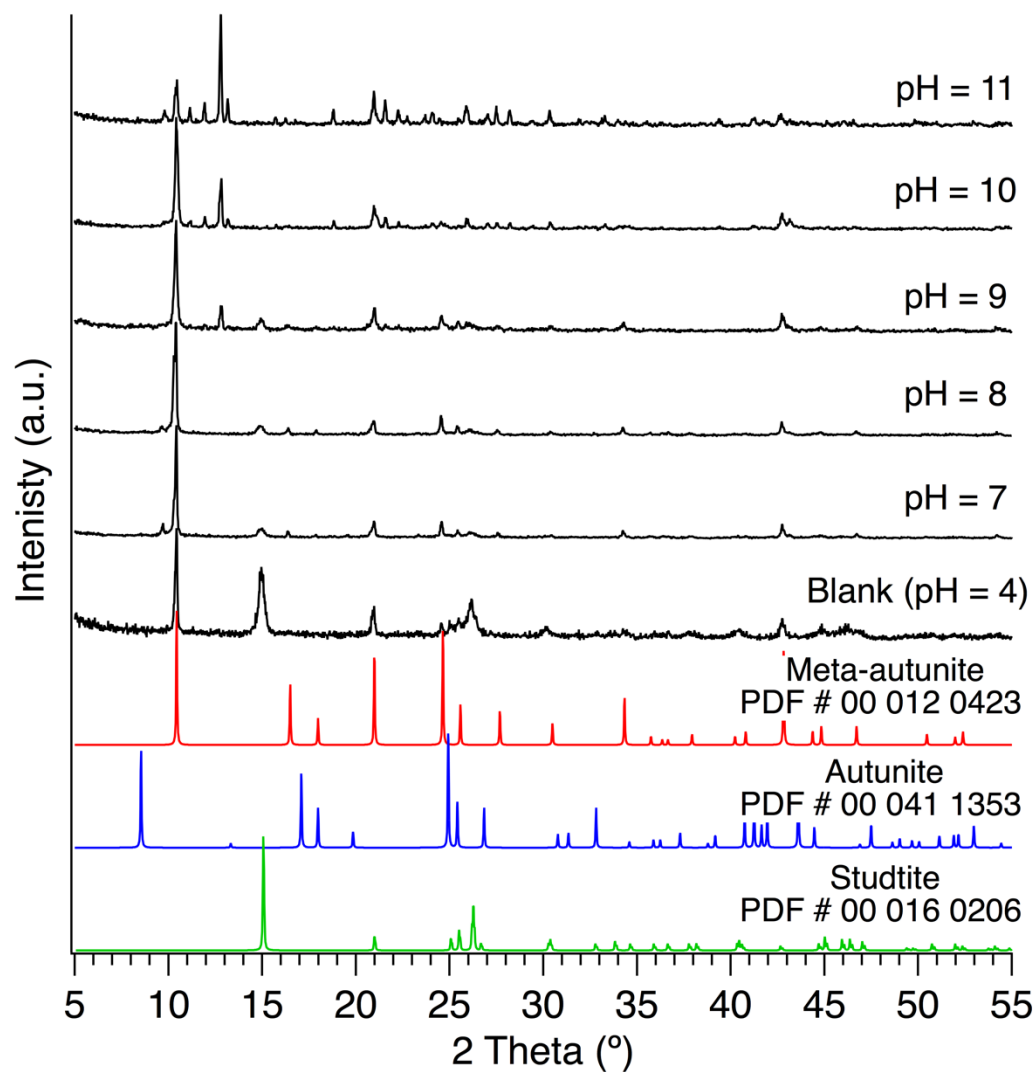


Figure S98. PXRD spectra from solids resulting from mixing CaUP with 0.50 M H₂O₂ at pH 7 to 11.

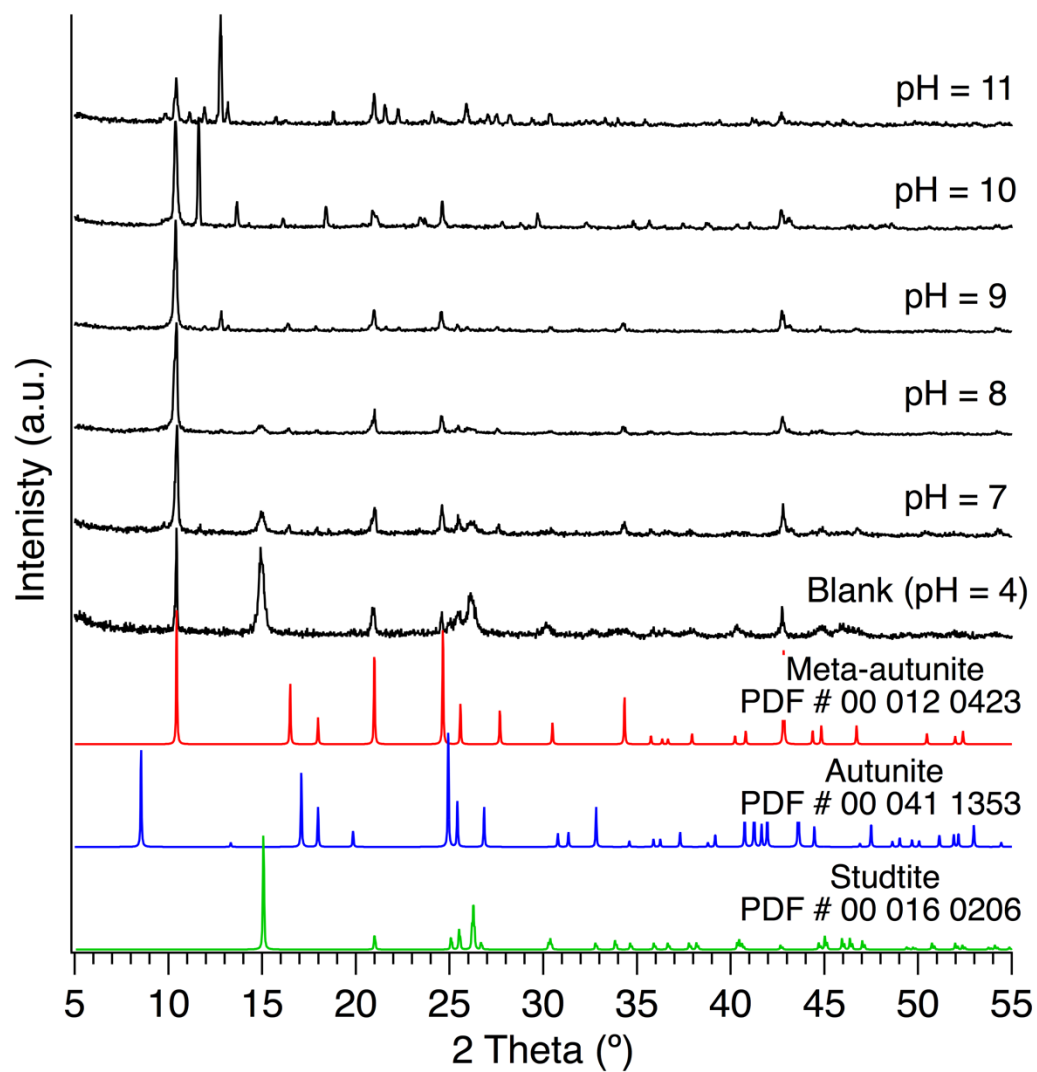


Figure S99. PXRD spectra from solids resulting from mixing CaUP with 1.0 M H₂O₂ at pH 7 to 11.

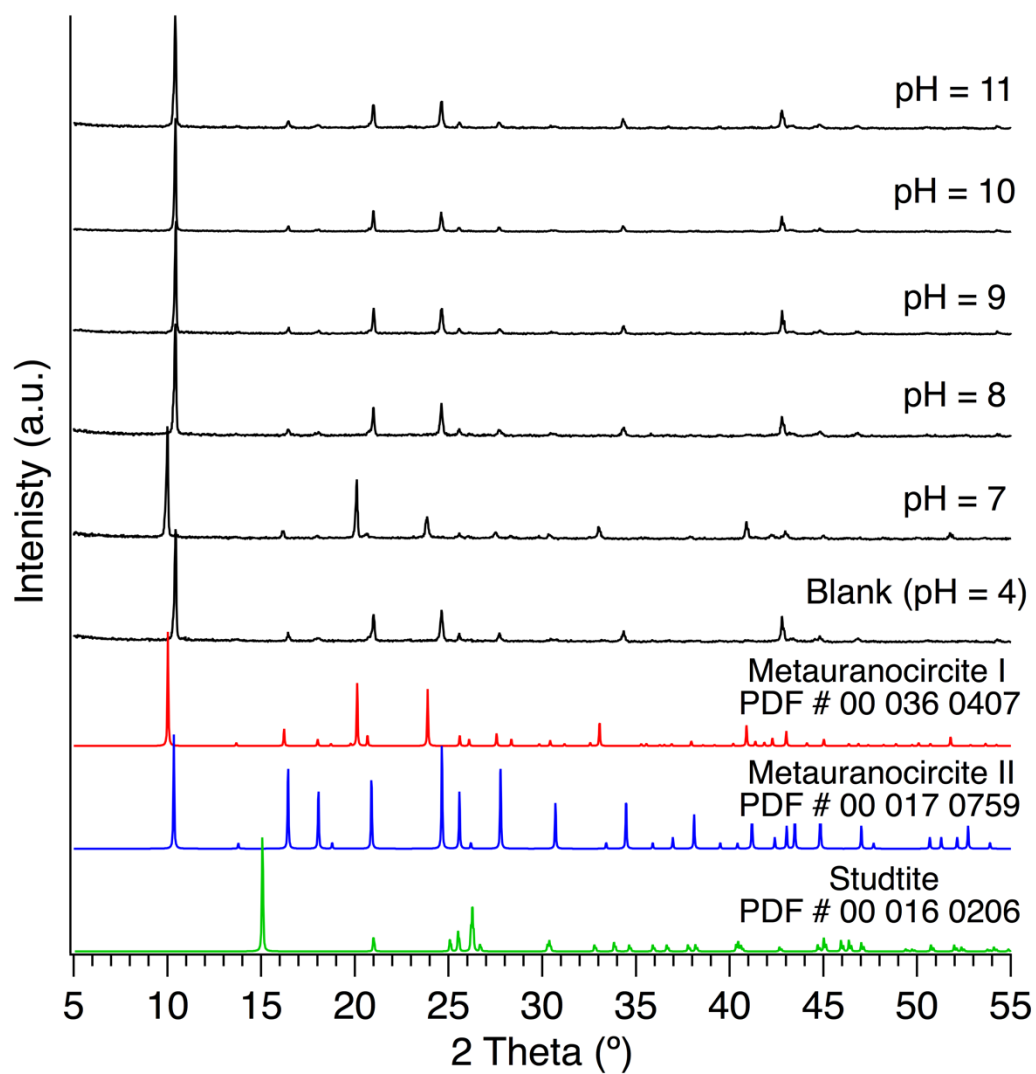


Figure S100. PXRD spectra from solids resulting from mixing BaUP with water at pH 7 to 11.

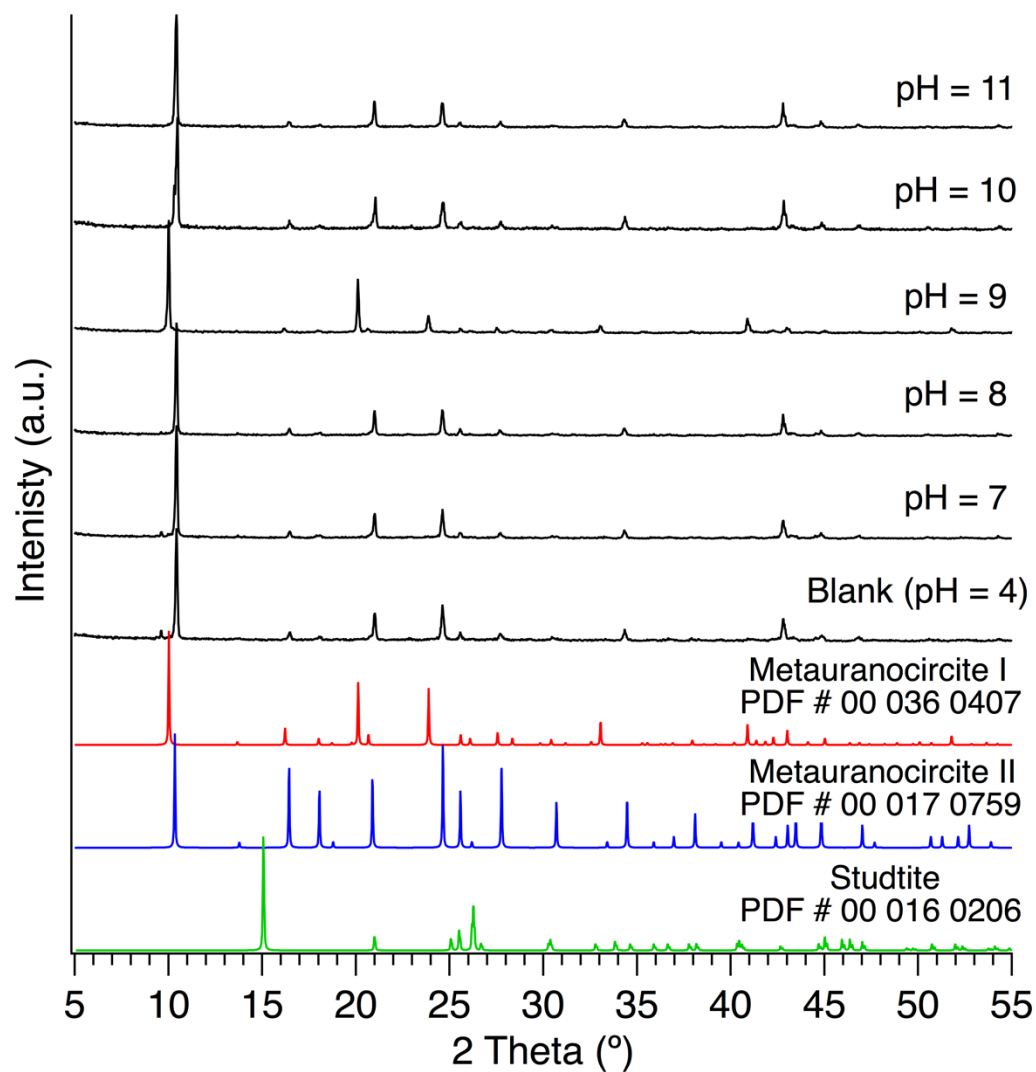


Figure S101. PXRD spectra from solids resulting from mixing BaUP with 0.01 M H₂O₂ at pH 7 to 11.

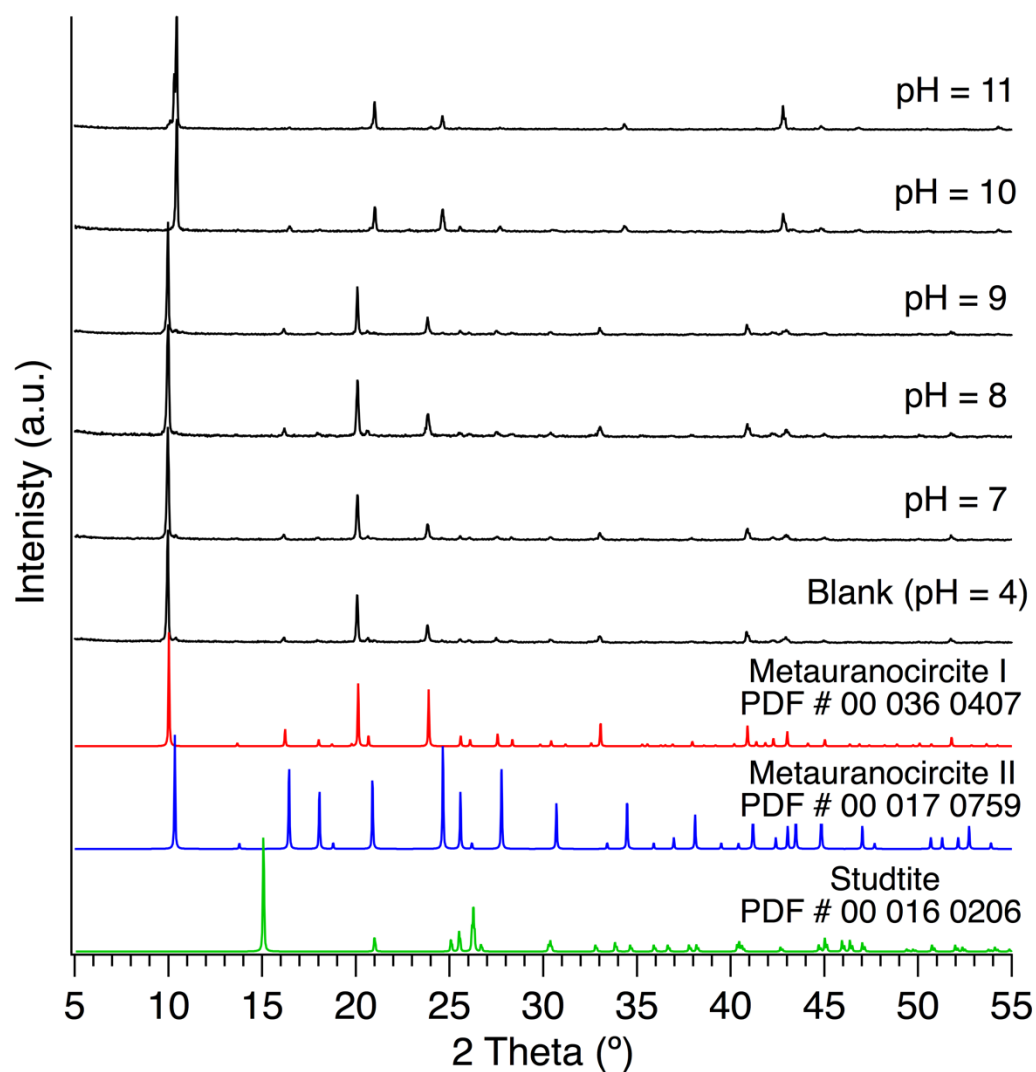


Figure S102. PXRD spectra from solids resulting from mixing BaUP with 0.035 M H₂O₂ at pH 7 to 11.

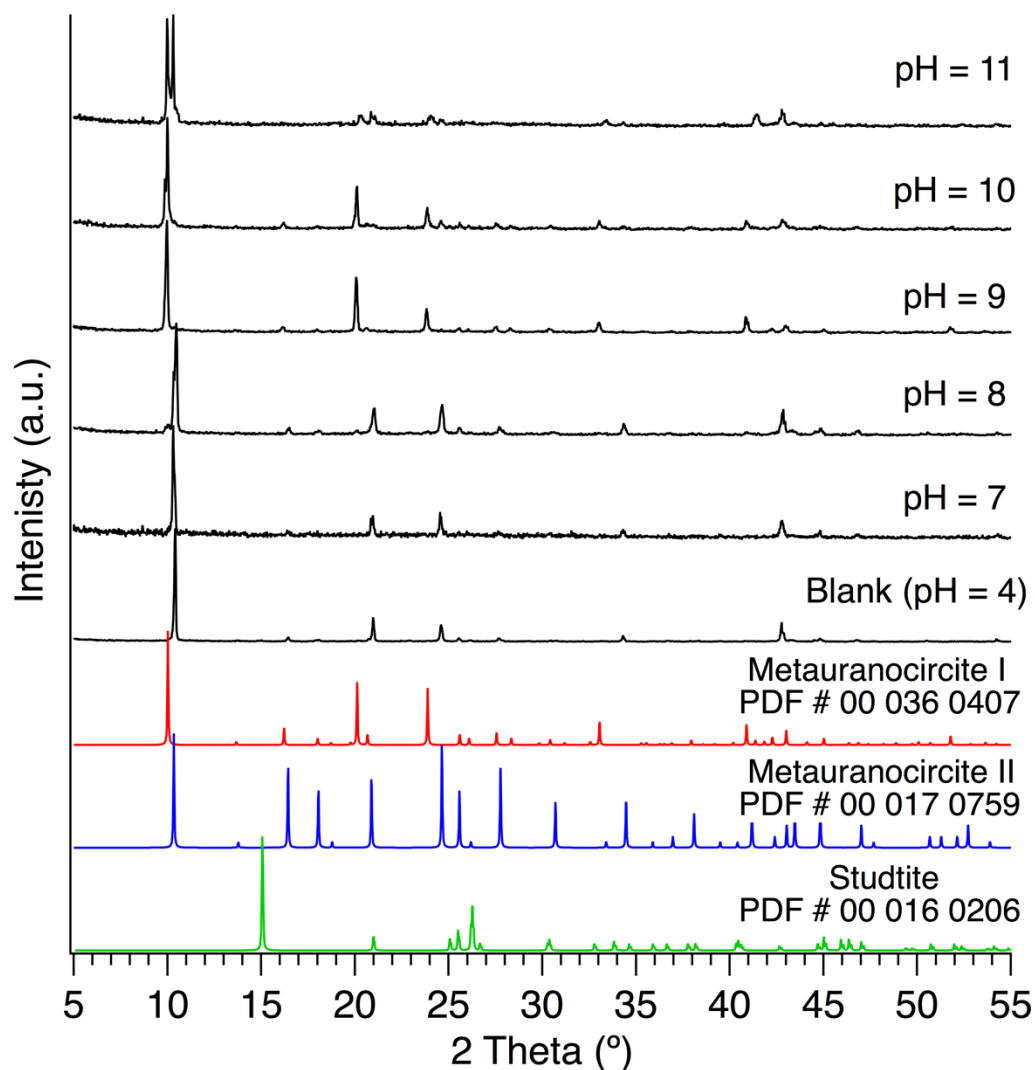


Figure S103. PXRD spectra from solids resulting from mixing BaUP with 0.10 M H₂O₂ at pH 7 to 11.

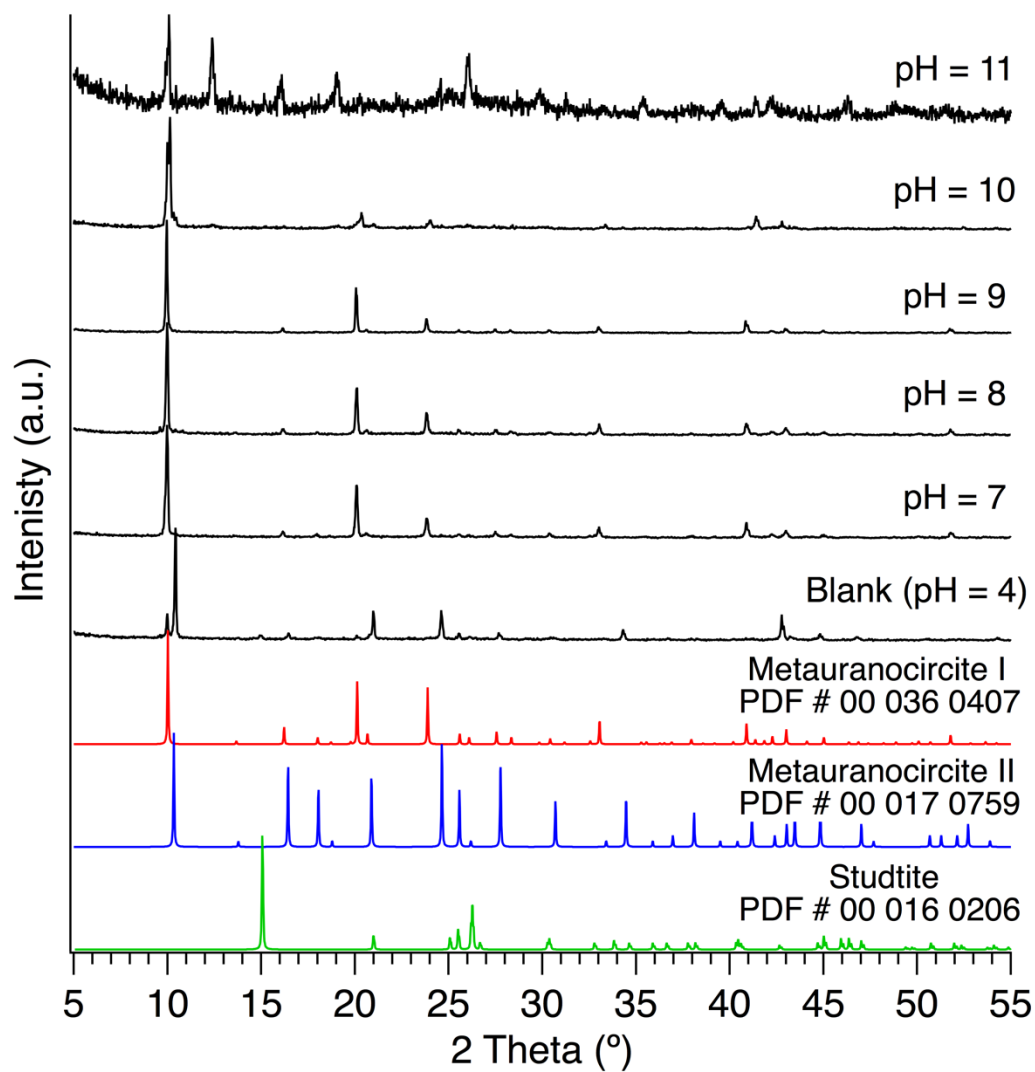


Figure S104. PXRD spectra from solids resulting from mixing BaUP with 0.50 M H₂O₂ at pH 7 to 11.

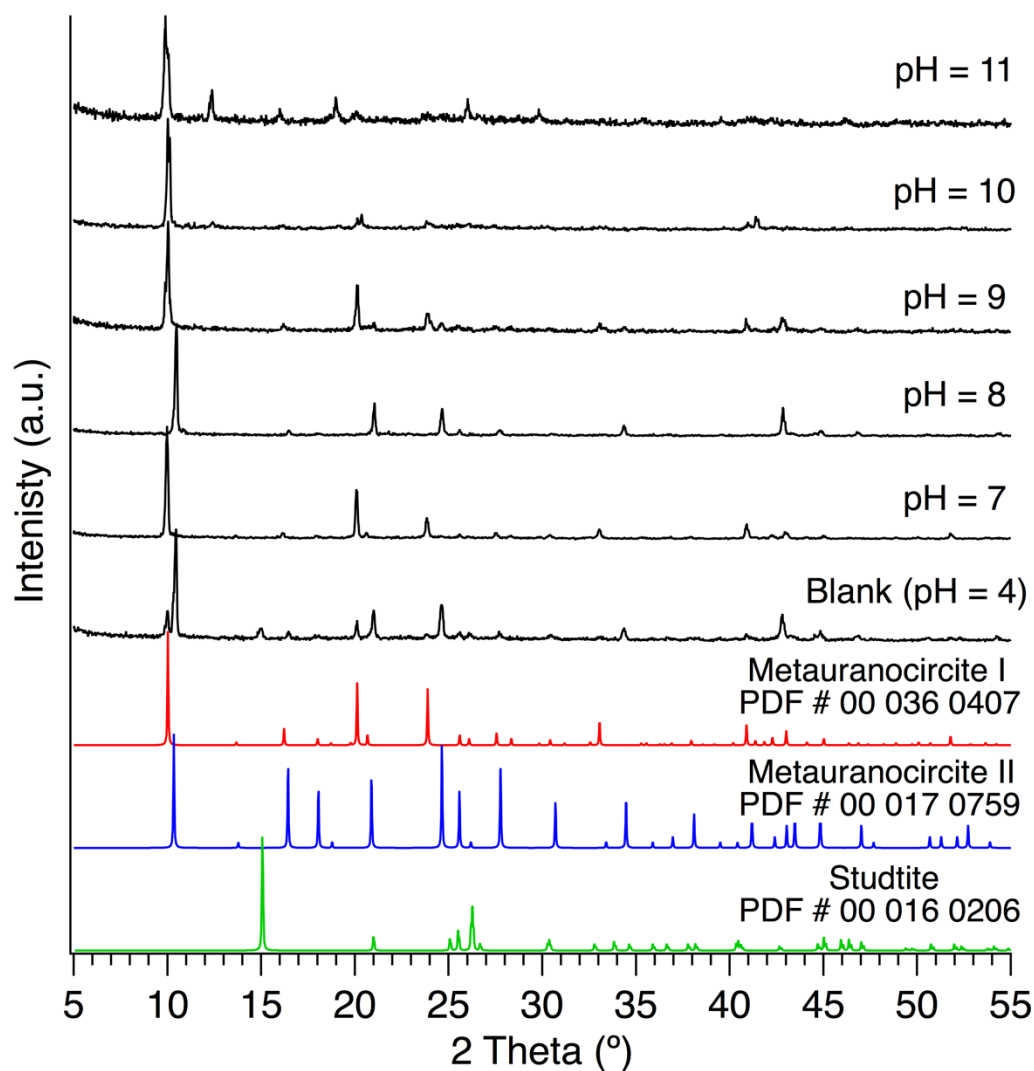


Figure S 105. PXRD spectra from solids resulting from mixing BaUP with 1.0 M H₂O₂ at pH 7 to 11.

