

Supporting Information

Modification of the surface properties of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ substrates with gradient aluminum composition using wet chemical treatments

Sara Gleco[†], Oleksandr Romanyuk[‡], Ivan Gordeev[‡], Karla Kuldová[‡], Tania Paskova^{†,§}, Albena Ivanisevic^{†*}.

[†] Department of Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, 27695, USA

[‡] Institute of Physics, Academy of Sciences of the Czech Republic, Cukrovarnická 10, 162 00 Prague 6, Czech Republic

[§] Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, North Carolina, 27695, USA

23 pages, 15 figures

Figure S1. XRD measurements

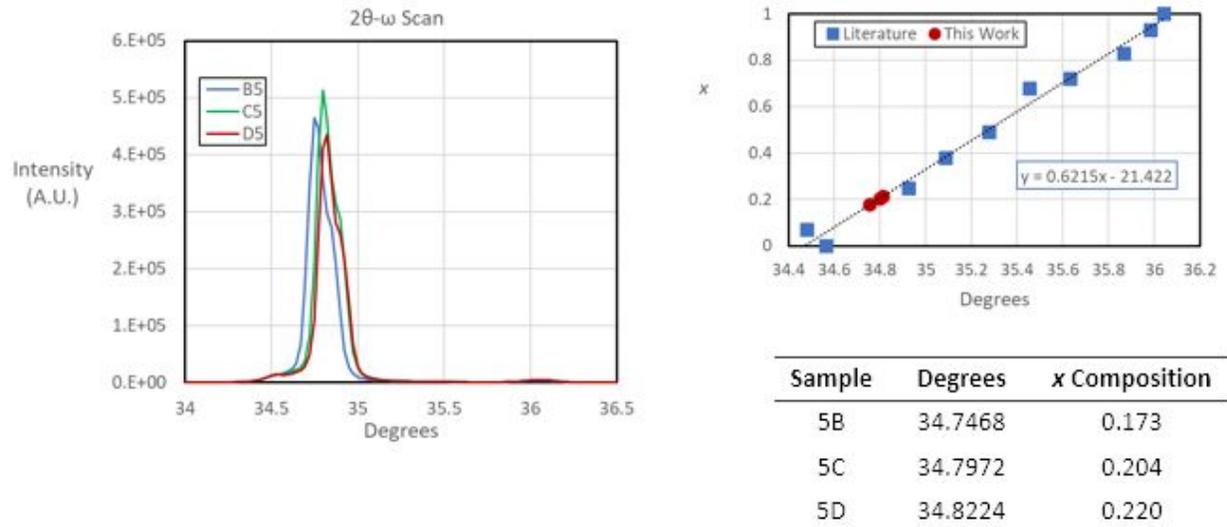


Figure S2. XPS species percentages

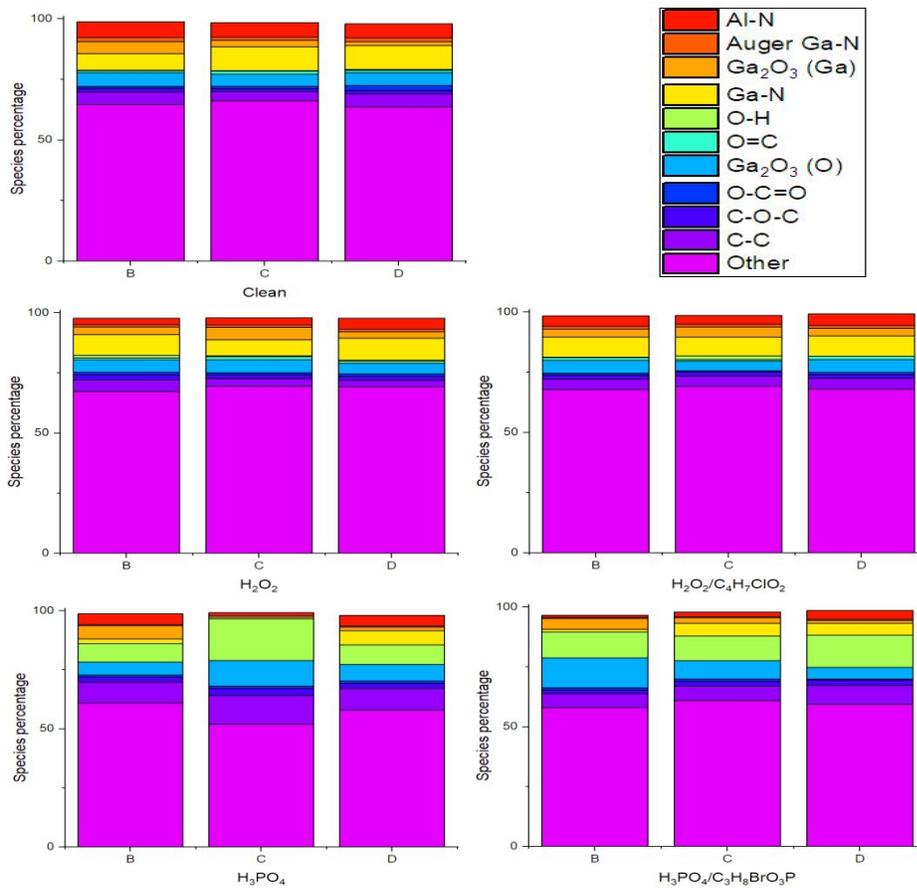


Figure S3. Representative Raman Data

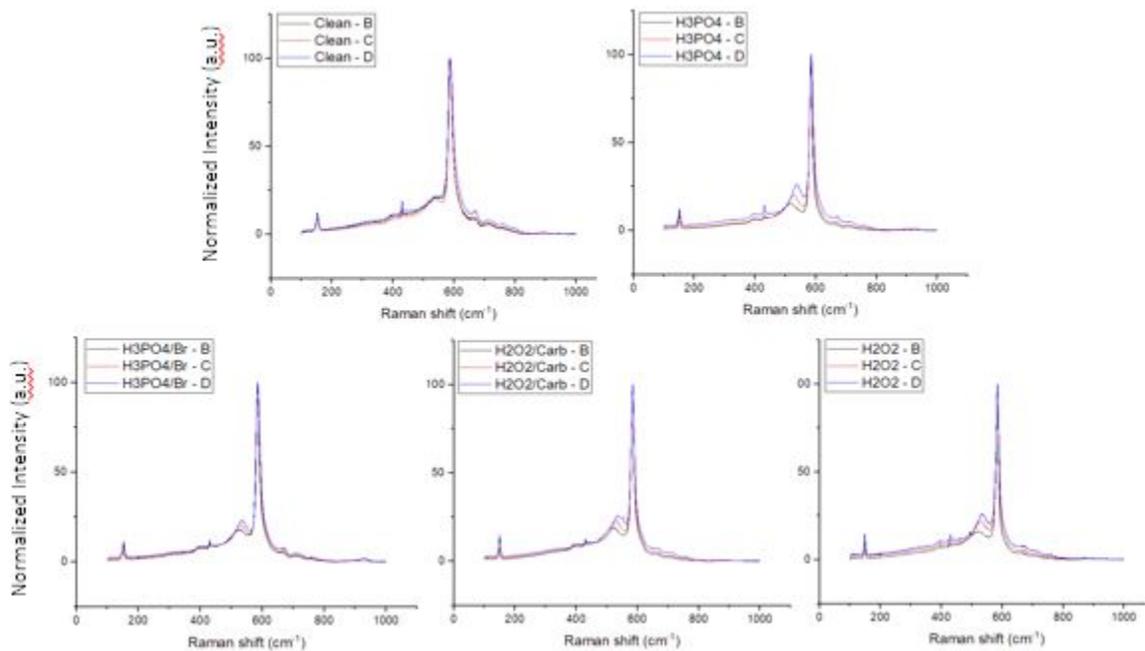


Figure S4. Representative AFM images

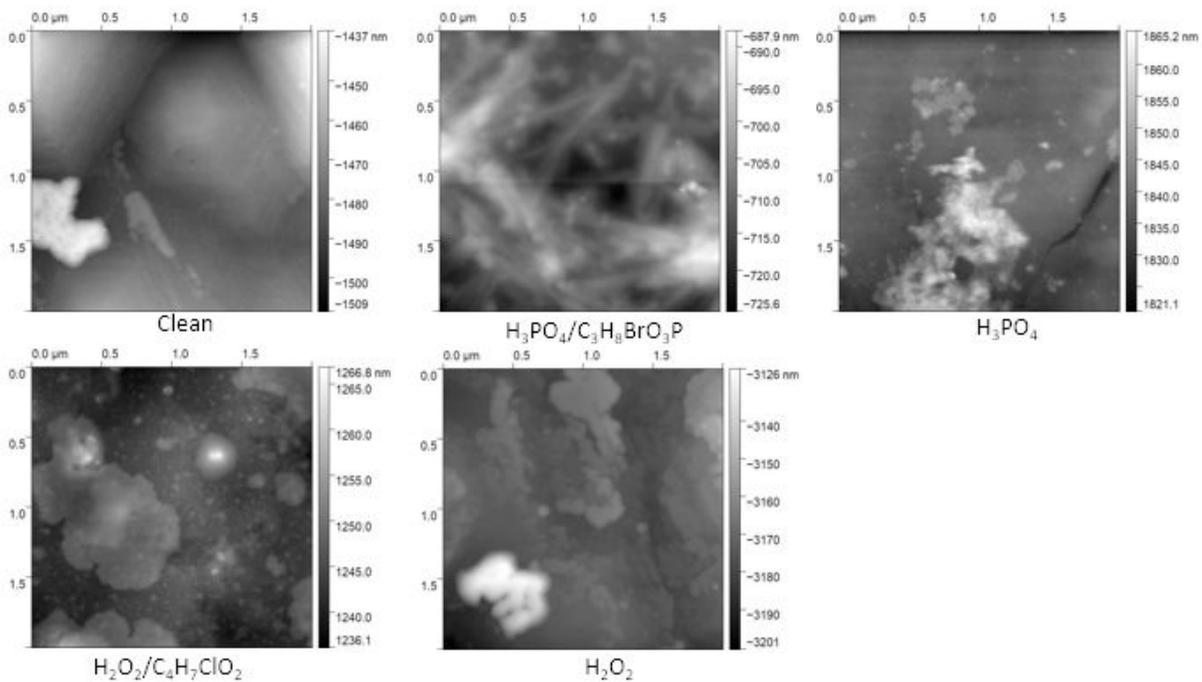


Figure S5. SEM images: a) clean, b) H_3PO_4 , c) $\text{H}_3\text{PO}_4/\text{C}_3\text{H}_8\text{BrO}_3\text{P}$, d) H_2O_2 , and e) $\text{H}_2\text{O}_2/\text{C}_4\text{H}_7\text{ClO}_2$

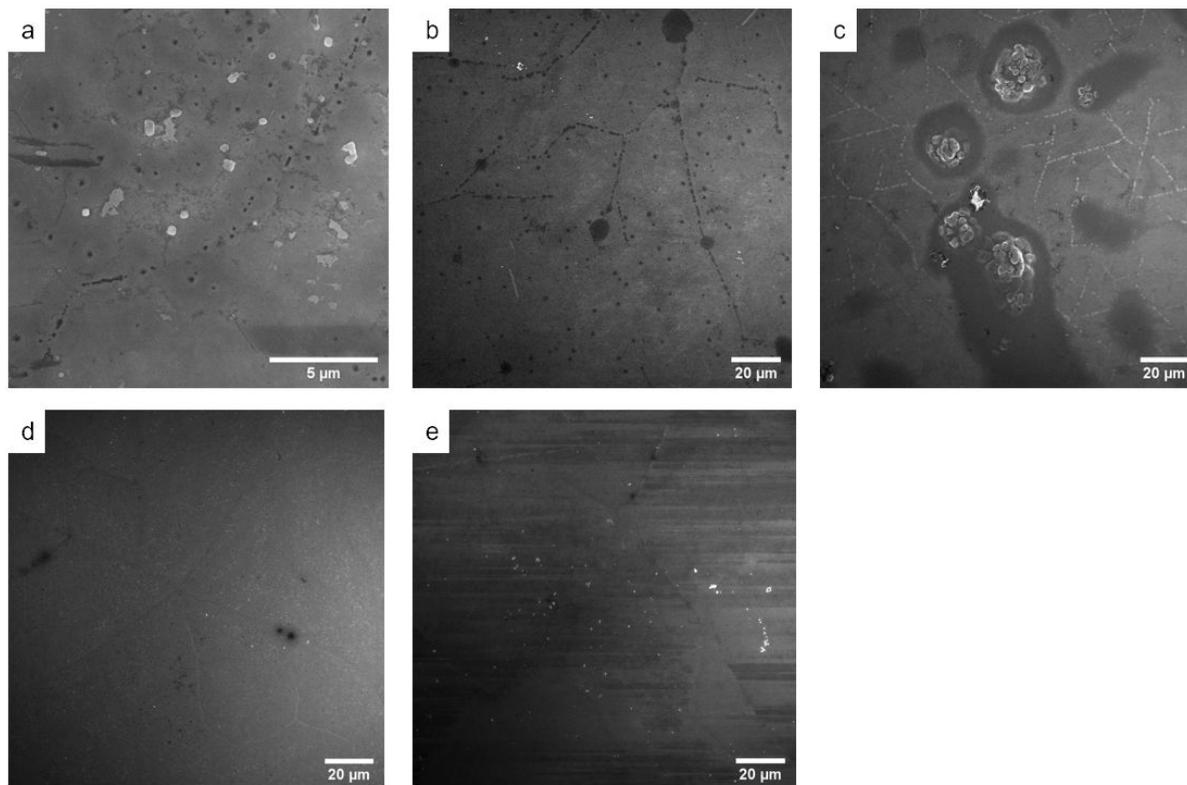


Figure S6. Table of XPS atomic percentages

Treatment	Sample	O 1s	C 1s	N 1s	Al 2s	Al 2p	Ga 3s	Ga 2p	Ga 3p	Ga 3d	O 2s	P 2p	P 2s	Ga 3p _{3/2}
Clean	B	6.65	7.52	32.22	8.15	7.78	7.52	2.84	13.99	13.32	0	0	0	0
Clean	C	6.59	5.95	33.24	7.02	7.54	8.04	3.23	14.65	13.74	0	0	0	0
Clean	D	6.64	8.8	31.87	7.78	7.84	7.45	2.65	13.91	13.05	0	0	0	0
H_2O_2	B	6.74	6.82	30.84	0	5.87	7.64	2.82	0	12.82	0	10.49	0	15.96
H_2O_2	C	6.2	6.42	31.08	0	5.08	7.92	3.06	0	13.09	0	10.93	0	16.22
H_2O_2	D	6.64	6.97	30.85	0	5.5	7.78	2.93	0	12.86	0	10.55	0	15.93
$\text{H}_2\text{O}_2/\text{C}_4\text{H}_7\text{ClO}_2$	B	6.9	8.04	29.38	0	4.81	8.57	2.28	0	12.89	0	11.17	0	15.95
$\text{H}_2\text{O}_2/\text{C}_4\text{H}_7\text{ClO}_2$	C	7.01	5.69	30.58	0	5	8.87	2.74	0	12.9	0	11.02	0	16.2
$\text{H}_2\text{O}_2/\text{C}_4\text{H}_7\text{ClO}_2$	D	5.76	5.22	31.64	0	6.75	8.42	2.83	0	12.92	0	10.61	0	15.85
H_3PO_4	B	23.32	8.27	18.33	3.85	4.41	8.47	1.25	6.15	5.98	2.29	9.93	7.75	0
H_3PO_4	C	17.86	9.12	22.44	3.5	4.07	10.06	1.49	7.58	8.03	1.05	8.11	6.69	0
H_3PO_4	D	18.17	10.67	21.71	4.74	5.04	8.68	1.36	7.45	6.73	0.21	8.3	6.93	0
$\text{H}_3\text{PO}_4/\text{C}_3\text{H}_8\text{BrO}_3\text{P}$	B	13.42	11.72	23.73	4.73	5.9	11.65	1.39	7.11	7.92	0	7.1	5.32	0
$\text{H}_3\text{PO}_4/\text{C}_3\text{H}_8\text{BrO}_3\text{P}$	C	28.51	16.19	9.18	1.54	1.98	11.22	0.43	1.97	1.35	7.7	10.76	9.16	0
$\text{H}_3\text{PO}_4/\text{C}_3\text{H}_8\text{BrO}_3\text{P}$	D	15.38	12.23	21.83	6.17	6.47	10.25	1.31	6.09	7.88	0	6.83	5.57	0

Figure S7. XPS relative species percentages

Treatment	Sample	Other	C-C	C-O-C	O-C=O	Ga ₂ O ₃ (O 1s)	O=C	O-H	Ga-N	Ga ₂ O ₃ (Ga 3d)	Auger Ga-N	Al-N	Al ₂ O ₃
Clean	B	64.72	5.15	1.36	1.00	5.51	0.92	0.22	6.77	5.02	1.53	6.53	1.25
Clean	C	66.18	3.89	1.09	0.97	4.98	1.44	0.17	9.79	2.68	1.28	6.01	1.53
Clean	D	63.66	5.29	1.61	1.90	5.37	0.94	0.33	9.87	1.69	1.49	5.79	2.05
H ₂ O ₂	B	67.35	4.75	2.14	1.15	5.09	0.82	0.99	8.73	3.12	1.04	2.54	2.27
H ₂ O ₂	C	69.41	3.24	1.61	0.84	5.37	1.31	0.33	6.66	5.15	1.08	2.97	2.03
H ₂ O ₂	D	69.35	2.69	1.68	0.85	4.42	0.98	0.36	9.12	2.74	1.07	4.55	2.20
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	67.75	4.41	1.67	0.74	5.46	1.14	0.14	8.37	3.20	1.25	4.27	1.60
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	69.21	4.31	1.58	0.52	4.00	0.72	1.48	7.74	4.17	1.18	3.66	1.42
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	68.04	4.39	1.58	1.00	5.22	1.34	0.08	8.55	3.05	1.26	4.77	0.73
H ₃ PO ₄	B	58.02	6.19	1.50	0.58	9.52	0.00	13.80	1.55	4.16	0.28	3.45	0.96
H ₃ PO ₄	C	60.92	6.90	1.68	0.53	6.82	0.00	11.04	3.82	3.78	0.43	2.47	1.60
H ₃ PO ₄	D	59.38	7.97	1.95	0.75	8.23	0.00	9.94	5.11	1.25	0.38	3.53	1.51
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	61.03	8.19	2.27	1.26	7.20	0.00	6.22	1.56	5.89	0.48	1.38	4.52
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	51.96	10.92	3.44	1.83	12.12	0.00	16.39	0.90	0.41	0.04	1.02	0.96
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	58.05	9.07	2.51	0.65	4.07	0.00	11.31	5.97	1.29	0.62	4.72	1.75

Figure S8. XPS species percentages of C 1s, O 2s, Ga 3d, and Al 2p high resolution spectra

Treatment	Sample	C-C	C-O-C	O-C=O	Ga ₂ O ₃ (O 1s)	O=C	O-H	Ga-N	Ga ₂ O ₃ (Ga 3d)	Auger Ga-N	Al-N	Al ₂ O ₃
Clean	B	68.55	18.11	13.34	82.84	13.78	3.38	50.84	37.69	11.47	83.94	16.06
Clean	C	65.42	18.34	16.25	75.61	21.81	2.58	71.23	19.47	9.29	79.69	20.31
Clean	D	60.1	18.32	21.58	80.82	14.2	4.98	75.61	12.96	11.43	73.89	26.11
H ₂ O ₂	B	59.1	26.63	14.27	73.7	11.88	14.41	67.76	24.17	8.07	52.89	47.11
H ₂ O ₂	C	56.93	28.31	14.76	76.54	18.68	4.77	51.65	39.96	8.39	59.46	40.54
H ₂ O ₂	D	51.59	32.18	16.22	76.73	17.08	6.19	70.62	21.22	8.27	67.43	32.57
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	64.66	24.46	10.89	80.94	16.92	2.14	65.29	24.98	9.72	72.8	27.2
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	67.2	24.66	8.14	64.45	11.62	23.92	59.14	31.84	9.02	72.11	27.89
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	63.03	22.66	14.3	78.63	20.22	1.15	66.49	23.72	9.79	86.68	13.23
H ₃ PO ₄	B	74.87	18.1	7.03	40.84	0	59.16	25.84	69.56	4.6	78.31	21.69
H ₃ PO ₄	C	75.68	18.47	5.85	38.21	0	61.79	47.55	47.07	5.39	60.7	39.3
H ₃ PO ₄	D	74.65	18.28	7.07	45.32	0	54.68	75.86	18.55	5.59	70.06	29.94
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	69.87	19.33	10.79	53.64	0	46.36	19.64	74.37	6	23.39	76.61
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	67.46	21.23	11.31	42.5	0	57.5	66.53	30.16	3.31	51.29	48.71
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	74.16	20.56	5.28	26.44	0	73.56	75.73	16.4	7.87	73.02	26.98

Figure S9. AFM Results

Treatment	Sample	RMS Roughness (μm)	Standard Deviation (μm)
Clean	B	1.05	0.34
Clean	C	1.29	0.48
Clean	D	1.17	0.03
H ₂ O ₂	B	3.03	0.37
H ₂ O ₂	C	3.58	0.38
H ₂ O ₂	D	4.19	0.54
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	1.25	0.01
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	1.36	1.23
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	1.63	0.48

H ₃ PO ₄	B	1.44	0.01
H ₃ PO ₄	C	1.65	0.78
H ₃ PO ₄	D	1.63	0.00
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.78	0.47
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.73	0.44
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	1.32	0.56

Figure S10. Contact angle data

Treatment	Sample	Mean Contact Angle (degrees)	Standard Deviation (degrees)
Clean	B	69.49	9.27
Clean	C	74.30	1.12
Clean	D	71.96	3.77
H ₂ O ₂	B	65.59	4.36
H ₂ O ₂	C	73.95	2.18
H ₂ O ₂	D	71.81	1.42
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	77.42	0.92
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	71.97	1.72
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	69.21	0.58
H ₃ PO ₄	B	23.06	2.50
H ₃ PO ₄	C	22.66	5.01
H ₃ PO ₄	D	17.72	6.81
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	31.74	2.75
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	27.65	3.97
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	29.38	2.99

Figure S11. KPFM data

Treatment	Sample	RMS Potential (mV)	Standard Deviation (mV)
Clean	B	752.02	42.74
Clean	C	539.34	109.84
Clean	D	901.10	33.31
H ₂ O ₂	B	415.61	51.84
H ₂ O ₂	C	1222.16	358.29
H ₂ O ₂	D	581.78	83.76
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	1415.33	21.08
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	1281.33	168.39
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	766.52	257.31
H ₃ PO ₄	B	613.68	41.08
H ₃ PO ₄	C	230.15	130.61
H ₃ PO ₄	D	693.68	74.62
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	869.44	78.58
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	623.11	26.50
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	825.90	34.12

Figure S12. AFM Statistics

Treatment	Sample	Treatment	Sample	Mean Diff	SEM	q Value	Prob	Alpha	Sig	LCL	UCL
Clean	C	Clean	B	1.4167	0.70448	2.84398	0.77704	0.05	0	-1.17931	4.0127
Clean	D	Clean	B	0.12155	0.70448	0.24401	1	0.05	0	-2.47446	2.71755
Clean	D	Clean	C	-1.29515	0.70448	2.59998	0.86388	0.05	0	-3.89116	1.30085
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	B	-0.26744	0.70448	0.53688	1	0.05	0	-2.86345	2.32856
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	C	-1.68414	0.70448	3.38086	0.53885	0.05	0	-4.28015	0.91187
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	D	-0.38899	0.70448	0.78089	1	0.05	0	-2.98499	2.20702
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	B	-0.31592	0.70448	0.6342	1	0.05	0	-2.91192	2.28009
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	C	-1.73262	0.70448	3.47818	0.49459	0.05	0	-4.32862	0.86339

H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	D	- 0.4374 7	0.704 48	0.878 2	1	0.05	0	- 3.033 47	2.158 54
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 0.0484 8	0.704 48	0.097 32	1	0.05	0	- 2.644 48	2.547 53
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	B	0.2680 5	0.704 48	0.538 11	1	0.05	0	- 2.327 95	2.864 06
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	C	- 1.1486 4	0.704 48	2.305 87	0.937 76	0.05	0	- 3.744 65	1.447 36
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	D	0.1465 1	0.704 48	0.294 11	1	0.05	0	- 2.449 5	2.742 51
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.5355	0.704 48	1.074 99	0.999 97	0.05	0	- 2.060 51	3.131 5
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.5839 7	0.704 48	1.172 31	0.999 91	0.05	0	- 2.012 03	3.179 98
H ₃ PO ₄	B	Clean	B	0.3866 3	0.704 48	0.776 14	1	0.05	0	- 2.209 38	2.982 63
H ₃ PO ₄	B	Clean	C	- 1.0300 7	0.704 48	2.067 84	0.972 74	0.05	0	- 3.626 08	1.565 93
H ₃ PO ₄	B	Clean	D	0.2650 8	0.704 48	0.532 14	1	0.05	0	- 2.330 93	2.861 08
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.6540 7	0.704 48	1.313 02	0.999 67	0.05	0	- 1.941 94	3.250 07
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.7025 5	0.704 48	1.410 34	0.999 28	0.05	0	- 1.893 46	3.298 55
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	0.1185 7	0.704 48	0.238 03	1	0.05	0	- 2.477 43	2.714 58
H ₃ PO ₄	C	Clean	B	0.5987 3	0.704 48	1.201 94	0.999 88	0.05	0	- 1.997 27	3.194 74
H ₃ PO ₄	C	Clean	C	- 0.8179 7	0.704 48	1.642 04	0.996 55	0.05	0	- 3.413 97	1.778 04
H ₃ PO ₄	C	Clean	D	0.4771 8	0.704 48	0.957 94	0.999 99	0.05	0	- 2.118 82	3.073 19
H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.8661 7	0.704 48	1.738 82	0.994 02	0.05	0	- 1.729 83	3.462 18
H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.9146 5	0.704 48	1.836 14	0.990 12	0.05	0	- 1.681 35	3.510 66

H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	0.3306 8	0.704 48	0.663 83	1	0.05	0	- 2.265 33	2.926 68
H ₃ PO ₄	C	H ₃ PO ₄	B	0.2121 1	0.704 48	0.425 8	1	0.05	0	- 2.383 9	2.808 11
H ₃ PO ₄	D	Clean	B	0.5857 7	0.704 48	1.175 92	0.999 91	0.05	0	- 2.010 23	3.181 78
H ₃ PO ₄	D	Clean	C	- 0.8309 3	0.704 48	1.668 06	0.995 98	0.05	0	- 3.426 93	1.765 08
H ₃ PO ₄	D	Clean	D	0.4642 2	0.704 48	0.931 91	0.999 99	0.05	0	- 2.131 78	3.060 23
H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.8532 1	0.704 48	1.712 8	0.994 81	0.05	0	- 1.742 79	3.449 22
H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.9016 9	0.704 48	1.810 12	0.991 32	0.05	0	- 1.694 32	3.497 69
H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	0.3177 2	0.704 48	0.637 81	1	0.05	0	- 2.278 29	2.913 72
H ₃ PO ₄	D	H ₃ PO ₄	B	0.1991 4	0.704 48	0.399 78	1	0.05	0	- 2.396 86	2.795 15
H ₃ PO ₄	D	H ₃ PO ₄	C	- 0.0129 6	0.704 48	0.026 02	1	0.05	0	- 2.608 97	2.583 04
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	Clean	B	0.1992 9	0.704 48	0.400 08	1	0.05	0	- 2.396 71	2.795 3
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	Clean	C	- 1.2174 1	0.704 48	2.443 91	0.907 51	0.05	0	- 3.813 41	1.378 6
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	Clean	D	0.0777 5	0.704 48	0.156 07	1	0.05	0	- 2.518 26	2.673 75
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.4667 4	0.704 48	0.936 96	0.999 99	0.05	0	- 2.129 27	3.062 74
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.5152 1	0.704 48	1.034 27	0.999 98	0.05	0	- 2.080 79	3.111 22
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 0.0687 6	0.704 48	0.138 03	1	0.05	0	- 2.664 77	2.527 25
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄	B	- 0.1873 3	0.704 48	0.376 07	1	0.05	0	- 2.783 34	2.408 67
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄	C	- 0.3994 4	0.704 48	0.801 86	1	0.05	0	- 2.995 44	2.196 57

H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	H ₃ PO ₄	D	- 0.3864 8	0.704 48	0.775 84	1	0.05	0	- 2.982 48	2.209 53
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	Clean	B	0.3124 2	0.704 48	0.627 18	1	0.05	0	- 2.283 58	2.908 43
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	Clean	C	- 1.1042 8	0.704 48	2.216 8	0.953 25	0.05	0	- 3.700 28	1.491 73
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	Clean	D	0.1908 7	0.704 48	0.383 18	1	0.05	0	- 2.405 13	2.786 88
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.5798 6	0.704 48	1.164 06	0.999 92	0.05	0	- 2.016 14	3.175 87
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.6283 4	0.704 48	1.261 38	0.999 79	0.05	0	- 1.967 66	3.224 35
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	0.0443 7	0.704 48	0.089 07	1	0.05	0	- 2.551 64	2.640 37
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄	B	- 0.0742	0.704 48	0.148 96	1	0.05	0	- 2.670 21	2.521 8
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄	C	- 0.2863 1	0.704 48	0.574 76	1	0.05	0	- 2.882 32	2.309 69
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₃ PO ₄	D	- 0.2733 5	0.704 48	0.548 74	1	0.05	0	- 2.869 35	2.322 66
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	0.1131 3	0.704 48	0.227 1	1	0.05	0	- 2.482 88	2.709 13
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	Clean	B	0.5776 3	0.704 48	1.159 57	0.999 92	0.05	0	- 2.018 38	3.173 63
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	Clean	C	- 0.8390 7	0.704 48	1.684 41	0.995 58	0.05	0	- 3.435 08	1.756 93
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	Clean	D	0.4560 8	0.704 48	0.915 56	1	0.05	0	- 2.139 93	3.052 08
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	0.8450 7	0.704 48	1.696 45	0.995 27	0.05	0	- 1.750 94	3.441 07
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	0.8935 5	0.704 48	1.793 77	0.992 01	0.05	0	- 1.702 46	3.489 55
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	0.3095 7	0.704 48	0.621 46	1	0.05	0	- 2.286 43	2.905 58
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄	B	0.191	0.704 48	0.383 43	1	0.05	0	- 2.405 01	2.787 01

H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄	C	- 0.0211 1	0.704 48	0.042 37	1	0.05	0	- 2.617 11	2.574 9
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₃ PO ₄	D	- 0.0081 4	0.704 48	0.016 35	1	0.05	0	- 2.604 15	2.587 86
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	0.3783 3	0.704 48	0.759 49	1	0.05	0	- 2.217 67	2.974 34
H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	0.2652	0.704 48	0.532 39	1	0.05	0	- 2.330 8	2.861 21
H ₂ O ₂	B	Clean	B	1.9796 3	0.704 48	3.974 05	0.293 9	0.05	0	- 0.616 38	4.575 63
H ₂ O ₂	B	Clean	C	0.5629 3	0.704 48	1.130 06	0.999 94	0.05	0	- 2.033 08	3.158 93
H ₂ O ₂	B	Clean	D	1.8580 8	0.704 48	3.730 04	0.386 12	0.05	0	- 0.737 93	4.454 08
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	2.2470 7	0.704 48	4.510 93	0.146 05	0.05	0	- 0.348 94	4.843 07
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	2.2955 5	0.704 48	4.608 24	0.127 05	0.05	0	- 0.300 46	4.891 55
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	1.7115 7	0.704 48	3.435 93	0.513 7	0.05	0	- 0.884 43	4.307 58
H ₂ O ₂	B	H ₃ PO ₄	B	1.593	0.704 48	3.197 9	0.623 15	0.05	0	- 1.003 01	4.189 01
H ₂ O ₂	B	H ₃ PO ₄	C	1.3808 9	0.704 48	2.772 1	0.804 75	0.05	0	- 1.215 11	3.976 9
H ₂ O ₂	B	H ₃ PO ₄	D	1.3938 6	0.704 48	2.798 13	0.794 9	0.05	0	- 1.202 15	3.989 86
H ₂ O ₂	B	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	1.7803 3	0.704 48	3.573 97	0.452 08	0.05	0	- 0.815 67	4.376 34
H ₂ O ₂	B	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	1.6672	0.704 48	3.346 86	0.554 47	0.05	0	- 0.928 8	4.263 21
H ₂ O ₂	B	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	1.402	0.704 48	2.814 47	0.788 61	0.05	0	- 1.194 01	3.998 01
H ₂ O ₂	C	Clean	B	2.5359 6	0.704 48	5.090 87	0.060 76	0.05	0	- 0.060 04	5.131 97
H ₂ O ₂	C	Clean	C	1.1192 6	0.704 48	2.246 89	0.948 36	0.05	0	- 1.476 74	3.715 27

H ₂ O ₂	C	Clean	D	2.4144 1	0.704 48	4.846 86	0.089 03	0.05	0	- 0.181 59	5.010 42
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	2.8034	0.704 48	5.627 75	0.024 84	0.05	1	0.207 4	5.399 41
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	2.8518 8	0.704 48	5.725 06	0.020 98	0.05	1	0.255 87	5.447 88
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	2.2679 1	0.704 48	4.552 76	0.137 62	0.05	0	- 0.328 1	4.863 91
H ₂ O ₂	C	H ₃ PO ₄	B	2.1493 3	0.704 48	4.314 73	0.191 3	0.05	0	- 0.446 67	4.745 34
H ₂ O ₂	C	H ₃ PO ₄	C	1.9372 3	0.704 48	3.888 93	0.324 39	0.05	0	- 0.658 78	4.533 23
H ₂ O ₂	C	H ₃ PO ₄	D	1.9501 9	0.704 48	3.914 95	0.314 87	0.05	0	- 0.645 82	4.546 19
H ₂ O ₂	C	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	2.3366 7	0.704 48	4.690 79	0.112 59	0.05	0	- 0.259 34	4.932 67
H ₂ O ₂	C	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	2.2235 4	0.704 48	4.463 69	0.156 07	0.05	0	- 0.372 47	4.819 54
H ₂ O ₂	C	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	1.9583 3	0.704 48	3.931 3	0.308 98	0.05	0	- 0.637 67	4.554 34
H ₂ O ₂	C	H ₂ O ₂	B	0.5563 3	0.704 48	1.116 82	0.999 95	0.05	0	- 2.039 67	3.152 34
H ₂ O ₂	D	Clean	B	3.1429 6	0.704 48	6.309 4	0.007 38	0.05	1	0.546 96	5.738 97
H ₂ O ₂	D	Clean	C	1.7262 6	0.704 48	3.465 42	0.500 34	0.05	0	- 0.869 74	4.322 27
H ₂ O ₂	D	Clean	D	3.0214 1	0.704 48	6.065 4	0.011 49	0.05	1	0.425 41	5.617 42
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	3.4104	0.704 48	6.846 28	0.002 73	0.05	1	0.814 4	6.006 41
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	3.4588 8	0.704 48	6.943 6	0.002 27	0.05	1	0.862 87	6.054 88
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	2.8749 1	0.704 48	5.771 29	0.019 36	0.05	1	0.278 9	5.470 91
H ₂ O ₂	D	H ₃ PO ₄	B	2.7563 3	0.704 48	5.533 26	0.029 21	0.05	1	0.160 33	5.352 34
H ₂ O ₂	D	H ₃ PO ₄	C	2.5442 3	0.704 48	5.107 46	0.059 16	0.05	0	- 0.051 78	5.140 23
H ₂ O ₂	D	H ₃ PO ₄	D	2.5571 9	0.704 48	5.133 48	0.056 74	0.05	0	- 0.038 82	5.153 19
H ₂ O ₂	D	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	B	2.9436 7	0.704 48	5.909 33	0.015 18	0.05	1	0.347 66	5.539 67

H ₂ O ₂	D	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	C	2.8305 4	0.704 48	5.682 22	0.022 61	0.05	1	0.234 53	5.426 54
H ₂ O ₂	D	H ₂ O ₂ /C ₄ H ₇ Cl O ₂	D	2.5653 3	0.704 48	5.149 83	0.055 26	0.05	0	- 0.030 67	5.161 34
H ₂ O ₂	D	H ₂ O ₂	B	1.1633 3	0.704 48	2.335 36	0.931 95	0.05	0	- 1.432 67	3.759 34
H ₂ O ₂	D	H ₂ O ₂	C	0.607	0.704 48	1.218 54	0.999 86	0.05	0	- 1.989 01	3.203 01

Figure S13. Contact angle statistics

Treatment	Sam ple	Treatment	Sam ple	Mean Diff	SEM	q Valu e	Prob	Alph a	Sig	LCL	UCL
Clean	C	Clean	B	4.808 33	3.405 7	1.996 66	0.979 54	0.05	0	- 7.741 73	17.35 84
Clean	D	Clean	B	2.473 33	3.405 7	1.027 05	0.999 98	0.05	0	- 10.07 67	15.02 34
Clean	D	Clean	C	-2.335	3.405 7	0.969 61	0.999 99	0.05	0	- 14.88 51	10.21 506
H ₂ O ₂	B	Clean	B	- 3.898 33	3.405 7	1.618 78	0.997	0.05	0	- 16.44 84	8.651 73
H ₂ O ₂	B	Clean	C	- 8.706 67	3.405 7	3.615 44	0.434 11	0.05	0	- 21.25 67	3.843 4
H ₂ O ₂	B	Clean	D	- 6.371 67	3.405 7	2.645 83	0.849 2	0.05	0	- 18.92 17	6.178 4
H ₂ O ₂	C	Clean	B	4.463 33	3.405 7	1.853 4	0.989 26	0.05	0	- 8.086 73	17.01 34
H ₂ O ₂	C	Clean	C	-0.345	3.405 7	0.143 26	1	0.05	0	- 12.89 51	12.20 506
H ₂ O ₂	C	Clean	D	1.99	3.405 7	0.826 35	1	0.05	0	- 10.56 01	14.54 006
H ₂ O ₂	C	H ₂ O ₂	B	8.361 67	3.405 7	3.472 18	0.497 29	0.05	0	- 4.188 4	20.91 173
H ₂ O ₂	D	Clean	B	2.315	3.405 7	0.961 3	0.999 99	0.05	0	- 10.23 51	14.86 506
H ₂ O ₂	D	Clean	C	- 2.493 33	3.405 7	1.035 36	0.999 98	0.05	0	- 15.04 34	10.05 673

H ₂ O ₂	D	Clean	D	-0.15833	3.4057	0.06575	1	0.05	0	-12.7084	12.39173
H ₂ O ₂	D	H ₂ O ₂	B	6.21333	3.4057	2.58008	0.86999	0.05	0	-6.33673	18.7634
H ₂ O ₂	D	H ₂ O ₂	C	-2.14833	3.4057	0.89209	1	0.05	0	-14.6984	10.40173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	B	7.925	3.4057	3.29085	0.58031	0.05	0	-4.62506	20.47506
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	C	3.11667	3.4057	1.29419	0.99972	0.05	0	-9.4334	15.66673
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	D	5.45167	3.4057	2.2638	0.94546	0.05	0	-7.0984	18.00173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	B	11.82333	3.4057	4.90963	0.08083	0.05	0	-0.72673	24.3734
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	C	3.46167	3.4057	1.43746	0.99912	0.05	0	-9.0884	16.01173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	D	5.61	3.4057	2.32955	0.93312	0.05	0	-6.94006	18.16006
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	B	2.47667	3.4057	1.02843	0.99998	0.05	0	-10.0734	15.02673
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	C	-2.33167	3.4057	0.96822	0.99999	0.05	0	-14.8817	10.2184
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	D	0.00333	3.4057	0.00138	1	0.05	0	-12.5467	12.5534
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	B	6.375	3.4057	2.64721	0.84874	0.05	0	-6.17506	18.92506
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	C	-1.98667	3.4057	0.82496	1	0.05	0	-14.5367	10.5634
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	D	0.16167	3.4057	0.06713	1	0.05	0	-12.3884	12.71173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-5.44833	3.4057	2.26242	0.9457	0.05	0	-17.9984	7.10173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	B	-0.27667	3.4057	0.11489	1	0.05	0	-12.8267	12.2734
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	C	-5.085	3.4057	2.11154	0.9678	0.05	0	-17.6351	7.46506

H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	D	-2.75	3.405 7	1.141 94	0.999 93	0.05	0	- 15.30 01	9.800 06
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	B	3.621 67	3.405 7	1.503 89	0.998 58	0.05	0	- 8.928 4	16.17 173
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	C	-4.74	3.405 7	1.968 28	0.981 86	0.05	0	- 17.29 01	7.810 06
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	D	- 2.591 67	3.405 7	1.076 19	0.999 97	0.05	0	- 15.14 17	9.958 4
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	- 8.201 67	3.405 7	3.405 74	0.527 46	0.05	0	- 20.75 17	4.348 4
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	- 2.753 33	3.405 7	1.143 32	0.999 93	0.05	0	- 15.30 34	9.796 73
H ₃ PO ₄	B	Clean	B	-46.43	3.405 7	19.28 003	5.55E -08	0.05	1	- 58.98 01	- 33.87 99
H ₃ PO ₄	B	Clean	C	- 51.23 83	3.405 7	21.27 669	2.38E -09	0.05	1	- 63.78 84	- 38.68 83
H ₃ PO ₄	B	Clean	D	- 48.90 33	3.405 7	20.30 708	6.19E -09	0.05	1	- 61.45 34	- 36.35 33
H ₃ PO ₄	B	H ₂ O ₂	B	- 42.53 17	3.405 7	17.66 125	4.96E -08	0.05	1	- 55.08 17	- 29.98 16
H ₃ PO ₄	B	H ₂ O ₂	C	- 50.89 33	3.405 7	21.13 343	2.94E -09	0.05	1	- 63.44 34	- 38.34 33
H ₃ PO ₄	B	H ₂ O ₂	D	- 48.74 5	3.405 7	20.24 133	6.45E -09	0.05	1	- 61.29 51	- 36.19 49
H ₃ PO ₄	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	- 54.35 5	3.405 7	22.57 088	0	0.05	1	- 66.90 51	- 41.80 49
H ₃ PO ₄	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	- 48.90 67	3.405 7	20.30 846	6.18E -09	0.05	1	- 61.45 67	- 36.35 66
H ₃ PO ₄	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	- 46.15 33	3.405 7	19.16 514	4.52E -08	0.05	1	- 58.70 34	- 33.60 33
H ₃ PO ₄	C	Clean	B	-46.83	3.405 7	19.44 613	5.53E -08	0.05	1	- 59.38 01	- 34.27 99
H ₃ PO ₄	C	Clean	C	- 51.63 83	3.405 7	21.44 279	1.73E -09	0.05	1	- 64.18 84	- 39.08 83
H ₃ PO ₄	C	Clean	D	- 49.30 33	3.405 7	20.47 318	5.53E -09	0.05	1	- 61.85 34	- 36.75 33

H ₃ PO ₄	C	H ₂ O ₂	B	-42.93 17	3.405 7	17.82 735	4.91E -08	0.05	1	-55.48 17	-30.38 16
H ₃ PO ₄	C	H ₂ O ₂	C	-51.29 33	3.405 7	21.29 953	2.29E -09	0.05	1	-63.84 34	-38.74 33
H ₃ PO ₄	C	H ₂ O ₂	D	-49.14 5	3.405 7	20.40 743	5.79E -09	0.05	1	-61.69 51	-36.59 49
H ₃ PO ₄	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-54.75 5	3.405 7	22.73 698	0	0.05	1	-67.30 51	-42.20 49
H ₃ PO ₄	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	-49.30 67	3.405 7	20.47 456	5.53E -09	0.05	1	-61.85 67	-36.75 66
H ₃ PO ₄	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	-46.55 33	3.405 7	19.33 124	5.54E -08	0.05	1	-59.10 34	-34.00 33
H ₃ PO ₄	C	H ₃ PO ₄	B	-0.4	3.405 7	0.166 1	1	0.05	0	-12.95 01	12.15 006
H ₃ PO ₄	D	Clean	B	-51.77 5	3.405 7	21.49 954	1.51E -09	0.05	1	-64.32 51	-39.22 49
H ₃ PO ₄	D	Clean	C	-56.58 33	3.405 7	23.49 62	0	0.05	1	-69.13 34	-44.03 33
H ₃ PO ₄	D	Clean	D	-54.24 83	3.405 7	22.52 659	0	0.05	1	-66.79 84	-41.69 83
H ₃ PO ₄	D	H ₂ O ₂	B	-47.87 67	3.405 7	19.88 076	7.87E -09	0.05	1	-60.42 67	-35.32 66
H ₃ PO ₄	D	H ₂ O ₂	C	-56.23 83	3.405 7	23.35 293	0	0.05	1	-68.78 84	-43.68 83
H ₃ PO ₄	D	H ₂ O ₂	D	-54.09	3.405 7	22.46 084	0	0.05	1	-66.64 01	-41.53 99
H ₃ PO ₄	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-59.7	3.405 7	24.79 039	0	0.05	1	-72.25 01	-47.14 99
H ₃ PO ₄	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	-54.25 17	3.405 7	22.52 797	0	0.05	1	-66.80 17	-41.70 16
H ₃ PO ₄	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	-51.49 83	3.405 7	21.38 465	1.96E -09	0.05	1	-64.04 84	-38.94 83
H ₃ PO ₄	D	H ₃ PO ₄	B	-5.345	3.405 7	2.219 51	0.952 83	0.05	0	-17.89 51	7.205 06
H ₃ PO ₄	D	H ₃ PO ₄	C	-4.945	3.405 7	2.053 41	0.974 24	0.05	0	-17.49 51	7.605 06

H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	B	-33.9967	3.4057	14.1171	1.24E-07	0.05	1	-46.5467	-21.4466
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	C	-38.805	3.4057	16.11375	8.37E-07	0.05	1	-51.3551	-26.2549
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	D	-36.47	3.4057	15.14415	1.30E-07	0.05	1	-49.0201	-23.9199
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂	B	-30.0983	3.4057	12.49831	1.25E-07	0.05	1	-42.6484	-17.5483
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂	C	-38.46	3.4057	15.97049	8.23E-07	0.05	1	-51.0101	-25.9099
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂	D	-36.3117	3.4057	15.0784	1.29E-07	0.05	1	-48.8617	-23.7616
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-41.9217	3.4057	17.40795	3.99E-06	0.05	1	-54.4717	-29.3716
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	-36.4733	3.4057	15.14553	1.30E-07	0.05	1	-49.0234	-23.9233
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	-33.72	3.4057	14.00221	6.45E-08	0.05	1	-46.2701	-21.1699
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₃ PO ₄	B	12.43333	3.4057	5.16293	0.0541	0.05	0	-0.11673	24.9834
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₃ PO ₄	C	12.83333	3.4057	5.32903	0.04119	0.05	1	0.28327	25.3834
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	H ₃ PO ₄	D	17.77833	3.4057	7.38244	9.86E-04	0.05	1	5.22827	30.3284
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	B	-41.845	3.4057	17.37611	4.03E-06	0.05	1	-54.3951	-29.2949
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	C	-46.6533	3.4057	19.37277	5.54E-08	0.05	1	-59.2034	-34.1033
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	D	-44.3183	3.4057	18.40316	4.75E-08	0.05	1	-56.8684	-31.7683
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂	B	-37.9467	3.4057	15.75733	3.28E-07	0.05	1	-50.4967	-25.3966
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂	C	-46.3083	3.4057	19.22951	5.55E-08	0.05	1	-58.8584	-33.7583
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂	D	-44.16	3.4057	18.33741	4.77E-08	0.05	1	-56.7101	-31.6099
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-49.77	3.4057	20.66696	4.77E-09	0.05	1	-62.3201	-37.2199

H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	-44.3217	3.4057	18.40455	4.75E-08	0.05	1	-56.8717	-31.7716
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	-41.5683	3.4057	17.26123	1.45E-07	0.05	1	-54.1184	-29.0183
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄	B	4.585	3.4057	1.90392	0.98637	0.05	0	-7.96506	17.13506
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄	C	4.985	3.4057	2.07002	0.9725	0.05	0	-7.56506	17.53506
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄	D	9.93	3.4057	4.12343	0.24506	0.05	0	-2.62006	22.48006
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	-7.84833	3.4057	3.25902	0.595	0.05	0	-20.3984	4.70173
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	B	-40.1117	3.4057	16.65635	1.43E-06	0.05	1	-52.6617	-27.5616
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	C	-44.92	3.4057	18.653	4.67E-08	0.05	1	-57.4701	-32.3699
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	D	-42.585	3.4057	17.6834	4.95E-08	0.05	1	-55.1351	-30.0349
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂	B	-36.2133	3.4057	15.03757	1.29E-07	0.05	1	-48.7634	-23.6633
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂	C	-44.575	3.4057	18.50974	4.72E-08	0.05	1	-57.1251	-32.0249
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂	D	-42.4267	3.4057	17.61765	4.97E-08	0.05	1	-54.9767	-29.8766
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-48.0367	3.4057	19.9472	7.61E-09	0.05	1	-60.5867	-35.4866
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	-42.5883	3.4057	17.68478	4.95E-08	0.05	1	-55.1384	-30.0383
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	-39.835	3.4057	16.54146	2.15E-06	0.05	1	-52.3851	-27.2849
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄	B	6.31833	3.4057	2.62368	0.85639	0.05	0	-6.23173	18.8684
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄	C	6.71833	3.4057	2.78978	0.79808	0.05	0	-5.83173	19.2684
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄	D	11.66333	3.4057	4.84319	0.08953	0.05	0	-0.88673	24.2134

H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	-6.115	3.4057	2.53925	0.88203	0.05	0	-18.6651	6.43506
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	1.73333	3.4057	0.71977	1	0.05	0	-10.8167	14.2834

Figure S14. KPFM statistics

Treatment	Sample	Treatment	Sample	Mean Diff	SEM	q Value	Prob	Alpha	Sig	LCL	UCL
Clean	C	Clean	B	-212.682	111.6422	2.69412	0.83288	0.05	0	-624.086	198.7223
Clean	D	Clean	B	149.084	111.6422	1.8885	0.98731	0.05	0	-262.32	560.4879
Clean	D	Clean	C	361.7657	111.6422	4.58262	0.13185	0.05	0	-49.6383	773.1696
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	B	117.418	111.6422	1.48738	0.99873	0.05	0	-293.986	528.8219
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	C	330.0997	111.6422	4.1815	0.2277	0.05	0	-81.3043	741.5036
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	Clean	D	-31.666	111.6422	0.40112	1	0.05	0	-443.07	379.7379
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	B	-128.905	111.6422	1.63288	0.99674	0.05	0	-540.309	282.4993
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	C	83.777	111.6422	1.06123	0.99997	0.05	0	-327.627	495.1809
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	Clean	D	-277.989	111.6422	3.52139	0.47526	0.05	0	-689.393	133.4153
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	-246.323	111.6422	3.12026	0.65858	0.05	0	-657.727	165.0813
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	B	73.878	111.6422	0.93584	0.99999	0.05	0	-337.526	485.2819
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	C	286.5597	111.6422	3.62996	0.42789	0.05	0	-124.844	697.9636
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	Clean	D	-75.206	111.6422	0.95266	0.99999	0.05	0	-486.61	336.1979
H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	-43.54	111.6422	0.55154	1	0.05	0	-454.944	367.8639

H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	202.7 827	111.6 422	2.568 72	0.873 41	0.05	0	- 208.6 21	614.1 866
H ₃ PO ₄	B	Clean	B	- 138.3 4	111.6 422	1.752 4	0.993 57	0.05	0	- 549.7 44	273.0 643
H ₃ PO ₄	B	Clean	C	74.34 2	111.6 422	0.941 72	0.999 99	0.05	0	- 337.0 62	485.7 459
H ₃ PO ₄	B	Clean	D	- 287.4 24	111.6 422	3.640 9	0.423 22	0.05	0	- 698.8 28	123.9 803
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 255.7 58	111.6 422	3.239 78	0.603 88	0.05	0	- 667.1 62	155.6 463
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	- 9.435	111.6 422	0.119 52	1	0.05	0	- 420.8 39	401.9 689
H ₃ PO ₄	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 212.2 18	111.6 422	2.688 24	0.834 91	0.05	0	- 623.6 22	199.1 863
H ₃ PO ₄	C	Clean	B	- 521.8 72	111.6 422	6.610 75	0.004 23	0.05	1	- 933.2 76	- 110.4 68
H ₃ PO ₄	C	Clean	C	- 309.1 91	111.6 422	3.916 63	0.314 26	0.05	0	- 720.5 95	102.2 133
H ₃ PO ₄	C	Clean	D	- 670.9 56	111.6 422	8.499 25	1.15E -04	0.05	1	- 1082. 36	- 259.5 52
H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 639.2 9	111.6 422	8.098 13	2.50E -04	0.05	1	- 1050. 69	- 227.8 86
H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	- 392.9 68	111.6 422	4.977 87	0.072 67	0.05	0	- 804.3 72	18.43 625
H ₃ PO ₄	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 595.7 5	111.6 422	7.546 59	7.21E -04	0.05	1	- 1007. 15	- 184.3 46
H ₃ PO ₄	C	H ₃ PO ₄	B	- 383.5 33	111.6 422	4.858 35	0.087 48	0.05	0	- 794.9 37	27.87 125
H ₃ PO ₄	D	Clean	B	- 58.33 53	111.6 422	0.738 96	1	0.05	0	- 469.7 39	353.0 686
H ₃ PO ₄	D	Clean	C	154.3 463	111.6 422	1.955 16	0.982 86	0.05	0	- 257.0 58	565.7 503
H ₃ PO ₄	D	Clean	D	- 207.4 19	111.6 422	2.627 46	0.855 18	0.05	0	- 618.8 23	203.9 846
H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 175.7 53	111.6 422	2.226 33	0.951 74	0.05	0	- 587.1 57	235.6 506

H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	70.56 933	111.6 422	0.893 93	1	0.05	0	- 340.8 35	481.9 733
H ₃ PO ₄	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 132.2 13	111.6 422	1.674 8	0.995 82	0.05	0	- 543.6 17	279.1 906
H ₃ PO ₄	D	H ₃ PO ₄	B	80.00 433	111.6 422	1.013 44	0.999 98	0.05	0	- 331.4	491.4 083
H ₃ PO ₄	D	H ₃ PO ₄	C	463.5 37	111.6 422	5.871 8	0.016 22	0.05	1	52.13 309	874.9 409
H ₂ O ₂	B	Clean	B	- 336.4 1	111.6 422	4.261 43	0.205 29	0.05	0	- 747.8 14	74.99 425
H ₂ O ₂	B	Clean	C	- 123.7 28	111.6 422	1.567 31	0.997 83	0.05	0	- 535.1 32	287.6 759
H ₂ O ₂	B	Clean	D	- 485.4 94	111.6 422	6.149 93	0.009 86	0.05	1	- 896.8 98	- 74.08 98
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 453.8 28	111.6 422	5.748 8	0.020 13	0.05	1	- 865.2 32	- 42.42 38
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	- 207.5 05	111.6 422	2.628 54	0.854 83	0.05	0	- 618.9 09	203.8 989
H ₂ O ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 410.2 88	111.6 422	5.197 27	0.051 16	0.05	0	- 821.6 92	1.116 25
H ₂ O ₂	B	H ₃ PO ₄	B	- 198.0 7	111.6 422	2.509 03	0.890 51	0.05	0	- 609.4 74	213.3 339
H ₂ O ₂	B	H ₃ PO ₄	C	185.4 627	111.6 422	2.349 32	0.929 07	0.05	0	- 225.9 41	596.8 666
H ₂ O ₂	B	H ₃ PO ₄	D	- 278.0 74	111.6 422	3.522 47	0.474 78	0.05	0	- 689.4 78	133.3 296
H ₂ O ₂	C	Clean	B	470.1 423	111.6 422	5.955 47	0.013 98	0.05	1	58.73 842	881.5 463
H ₂ O ₂	C	Clean	C	682.8 24	111.6 422	8.649 59	8.65E -05	0.05	1	271.4 201	1094. 228
H ₂ O ₂	C	Clean	D	321.0 583	111.6 422	4.066 97	0.262 81	0.05	0	- 90.34 56	732.4 623
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	352.7 243	111.6 422	4.468 09	0.155 12	0.05	0	- 58.67 96	764.1 283
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	599.0 47	111.6 422	7.588 35	6.65E -04	0.05	1	187.6 431	1010. 451
H ₂ O ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	396.2 643	111.6 422	5.019 63	0.068 05	0.05	0	- 15.13 96	807.6 683
H ₂ O ₂	C	H ₃ PO ₄	B	608.4 82	111.6 422	7.707 87	5.29E -04	0.05	1	197.0 781	1019. 886

H ₂ O ₂	C	H ₃ PO ₄	C	992.0 147	111.6 422	12.56 622	1.19E -07	0.05	1	580.6 108	1403. 419
H ₂ O ₂	C	H ₃ PO ₄	D	528.4 777	111.6 422	6.694 42	0.003 62	0.05	1	117.0 738	939.8 816
H ₂ O ₂	C	H ₂ O ₂	B	806.5 52	111.6 422	10.21 689	4.40E -06	0.05	1	395.1 481	1217. 956
H ₂ O ₂	D	Clean	B	- 170.2 39	111.6 422	2.156 48	0.962 06	0.05	0	- 581.6 43	241.1 649
H ₂ O ₂	D	Clean	C	42.44 267	111.6 422	0.537 64	1	0.05	0	- 368.9 61	453.8 466
H ₂ O ₂	D	Clean	D	- 319.3 23	111.6 422	4.044 98	0.269 96	0.05	0	- 730.7 27	92.08 091
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 287.6 57	111.6 422	3.643 86	0.421 97	0.05	0	- 699.0 61	123.7 469
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	- 41.33 43	111.6 422	0.523 6	1	0.05	0	- 452.7 38	370.0 696
H ₂ O ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 244.1 17	111.6 422	3.092 32	0.671 18	0.05	0	- 655.5 21	167.2 869
H ₂ O ₂	D	H ₃ PO ₄	B	- 31.89 93	111.6 422	0.404 08	1	0.05	0	- 443.3 03	379.5 046
H ₂ O ₂	D	H ₃ PO ₄	C	351.6 333	111.6 422	4.454 27	0.158 13	0.05	0	- 59.77 06	763.0 373
H ₂ O ₂	D	H ₃ PO ₄	D	- 111.9 04	111.6 422	1.417 53	0.999 24	0.05	0	- 523.3 08	299.5 003
H ₂ O ₂	D	H ₂ O ₂	B	166.1 707	111.6 422	2.104 95	0.968 58	0.05	0	- 245.2 33	577.5 746
H ₂ O ₂	D	H ₂ O ₂	C	- 640.3 81	111.6 422	8.111 95	2.43E -04	0.05	1	- 1051. 79	- 228.9 77
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	B	663.3 153	111.6 422	8.402 46	1.39E -04	0.05	1	251.9 114	1074. 719
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	C	875.9 97	111.6 422	11.09 658	8.58E -07	0.05	1	464.5 931	1287. 401
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	Clean	D	514.2 313	111.6 422	6.513 96	0.005 07	0.05	1	102.8 274	925.6 353
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	545.8 973	111.6 422	6.915 08	0.002 39	0.05	1	134.4 934	957.3 013
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	792.2 2	111.6 422	10.03 534	6.18E -06	0.05	1	380.8 161	1203. 624
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	589.4 373	111.6 422	7.466 62	8.40E -04	0.05	1	178.0 334	1000. 841
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄	B	801.6 55	111.6 422	10.15 486	4.94E -06	0.05	1	390.2 511	1213. 059
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄	C	1185. 188	111.6 422	15.01 321	1.29E -07	0.05	1	773.7 838	1596. 592

H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₃ PO ₄	D	721.6 507	111.6 422	9.141 42	3.37E -05	0.05	1	310.2 468	1133. 055
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	B	999.7 25	111.6 422	12.66 389	1.11E -07	0.05	1	588.3 211	1411. 129
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	C	193.1 73	111.6 422	2.446 99	0.906 74	0.05	0	- 218.2 31	604.5 769
H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	H ₂ O ₂	D	833.5 543	111.6 422	10.55 894	2.33E -06	0.05	1	422.1 504	1244. 958
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	B	529.3 153	111.6 422	6.705 03	0.003 55	0.05	1	117.9 114	940.7 193
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	C	741.9 97	111.6 422	9.399 15	2.06E -05	0.05	1	330.5 931	1153. 401
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	Clean	D	380.2 313	111.6 422	4.816 53	0.093 24	0.05	0	- 31.17 26	791.6 353
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	411.8 973	111.6 422	5.217 66	0.049 49	0.05	1	0.493 42	823.3 013
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	658.2 2	111.6 422	8.337 92	1.58E -04	0.05	1	246.8 161	1069. 624
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	455.4 373	111.6 422	5.769 19	0.019 43	0.05	1	44.03 342	866.8 413
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄	B	667.6 55	111.6 422	8.457 43	1.25E -04	0.05	1	256.2 511	1079. 059
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄	C	1051. 188	111.6 422	13.31 578	7.73E -08	0.05	1	639.7 838	1462. 592
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₃ PO ₄	D	587.6 507	111.6 422	7.443 99	8.77E -04	0.05	1	176.2 468	999.0 546
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	B	865.7 25	111.6 422	10.96 646	1.09E -06	0.05	1	454.3 211	1277. 129
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	C	59.17 3	111.6 422	0.749 57	1	0.05	0	- 352.2 31	470.5 769
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂	D	699.5 543	111.6 422	8.861 51	5.76E -05	0.05	1	288.1 504	1110. 958
H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	-134	111.6 422	1.697 43	0.995 24	0.05	0	- 545.4 04	277.4 039
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	B	14.50 467	111.6 422	0.183 74	1	0.05	0	- 396.8 99	425.9 086
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	C	227.1 863	111.6 422	2.877 85	0.763 45	0.05	0	- 184.2 18	638.5 903
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	Clean	D	- 134.5 79	111.6 422	1.704 77	0.995 04	0.05	0	- 545.9 83	276.8 246
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	B	- 102.9 13	111.6 422	1.303 64	0.999 7	0.05	0	- 514.3 17	308.4 906
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	C	143.4 093	111.6 422	1.816 62	0.991 03	0.05	0	- 267.9 95	554.8 133

H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄ /C ₃ H ₈ BrO ₃ P	D	- 59.37 33	111.6 422	0.752 1	1	0.05	0	- 470.7 77	352.0 306
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄	B	152.8 443	111.6 422	1.936 14	0.984 24	0.05	0	- 258.5 6	564.2 483
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄	C	536.3 77	111.6 422	6.794 49	0.003	0.05	1	124.9 731	947.7 809
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₃ PO ₄	D	72.84	111.6 422	0.922 69	0.999 99	0.05	0	- 338.5 64	484.2 439
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	B	350.9 143	111.6 422	4.445 16	0.160 15	0.05	0	- 60.48 96	762.3 183
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	C	- 455.6 38	111.6 422	5.771 73	0.019 34	0.05	1	- 867.0 42	- 44.23 38
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂	D	184.7 437	111.6 422	2.340 22	0.930 96	0.05	0	- 226.6 6	596.1 476
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	B	- 648.8 11	111.6 422	8.218 73	1.98E -04	0.05	1	- 1060. 21	- 237.4 07
H ₂ O ₂ /C ₄ H ₇ ClO ₂	D	H ₂ O ₂ /C ₄ H ₇ ClO ₂	C	- 514.8 11	111.6 422	6.521 3	0.005	0.05	1	- 926.2 15	- 103.4 07