

Supplementary Materials: Modification of the Surface Topography and Composition of Ultrafine and Coarse Grained Titanium by Chemical Etching

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Table S1. Topography parameters of the ultrafine grained (UFG) titanium surface etched in H₂SO₄/H₂O₂ solutions.

Scan Area, μm	Etching Time	R_{max} , nm	R_a , nm	RMS, nm	S_{surf}
1 × 1	0	17.1 ± 3.1	1.35 ± 0.17	1.91 ± 0.19	1.023 ± 0.004
	5 min	18.0 ± 2.9	1.46 ± 0.18	2.01 ± 0.22	1.031 ± 0.005
	15 min	17.8 ± 3.4	1.10 ± 0.15	1.51 ± 0.16	1.040 ± 0.004
	1 h	17.2 ± 1.9	1.51 ± 0.10	1.92 ± 0.12	1.015 ± 0.002
	2 h	16.5 ± 3.5	1.17 ± 0.23	1.52 ± 0.24	1.021 ± 0.004
	6 h	71.4 ± 11.9	5.14 ± 1.00	6.93 ± 1.10	1.040 ± 0.007
	24 h	49.3 ± 7.8	4.00 ± 0.80	5.41 ± 0.85	1.060 ± 0.006
10 × 10	0	126 ± 11	3.62 ± 0.67	6.54 ± 0.79	1.013 ± 0.003
	5 min	109 ± 13	3.77 ± 0.58	6.43 ± 0.92	1.012 ± 0.003
	15 min	125 ± 13	3.55 ± 0.55	6.18 ± 0.76	1.010 ± 0.002
	1 h	95.7 ± 9.9	5.04 ± 0.50	6.85 ± 0.59	1.012 ± 0.004
	2 h	142 ± 14	3.50 ± 0.73	4.93 ± 1.04	1.014 ± 0.003
	6 h	474 ± 42	21.5 ± 4.2	31.9 ± 5.1	1.071 ± 0.007
	24 h	601 ± 48	37.8 ± 3.8	53.1 ± 6.5	1.065 ± 0.006

Table S2. Topography parameters of the ultrafine grained (UFG) titanium surface etched in NH₄OH/H₂O₂ solutions.

Scan Area, μm	Etching Time	R_{max} , nm	R_a , nm	RMS, nm	S_{surf}
1 × 1	0	17.1 ± 3.1	1.35 ± 0.17	1.91 ± 0.19	1.023 ± 0.004
	5 min	57.7 ± 2.9	7.31 ± 0.16	9.29 ± 0.24	1.044 ± 0.014
	15 min	78.1 ± 3.9	7.58 ± 0.25	9.68 ± 0.23	1.402 ± 0.011
	1 h	97.9 ± 7.5	9.96 ± 0.56	12.7 ± 0.6	1.561 ± 0.015
	2 h	97.7 ± 5.2	11.3 ± 0.5	14.3 ± 0.5	1.419 ± 0.019
	6 h	96.4 ± 4.6	10.5 ± 0.4	13.5 ± 0.8	1.206 ± 0.017
	24 h	80.4 ± 5.0	8.64 ± 0.49	11.0 ± 0.6	1.328 ± 0.012
10 × 10	0	126 ± 11	3.62 ± 0.67	6.54 ± 0.79	1.013 ± 0.003
	5 min	199 ± 15	13.5 ± 1.1	17.6 ± 1.9	1.099 ± 0.012
	15 min	476 ± 40	40.6 ± 4.3	52.6 ± 5.2	1.151 ± 0.013
	1 h	486 ± 29	33.7 ± 3.6	45.5 ± 5.1	1.154 ± 0.023
	2 h	912 ± 37	63.8 ± 4.3	80.2 ± 5.2	1.350 ± 0.021
	6 h	1037 ± 69	95.0 ± 9.0	127 ± 13	1.280 ± 0.034

24 h	888 ± 71	75.3 ± 6.8	103 ± 7	1.117 ± 0.021
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Table S3. Topography parameters of the coarse grained (CG) titanium surface etched in H₂SO₄/H₂O₂ solutions.

Scan Area, μm	Etching Time	R _{max} , nm	R _a , nm	RMS, nm	S _{surf}
1 × 1	0	19.6 ± 1.4	1.84 ± 0.17	2.33 ± 0.21	1.029 ± 0.002
	5 min	22.3 ± 1.8	1.98 ± 0.19	2.78 ± 0.24	1.021 ± 0.002
	15 min	25.6 ± 2.9	2.23 ± 0.28	2.90 ± 0.31	1.027 ± 0.003
	1 h	21.1 ± 1.0	1.58 ± 0.09	2.12 ± 0.12	1.013 ± 0.002
	2 h	22.7 ± 1.3	2.30 ± 0.10	2.90 ± 0.16	1.017 ± 0.002
	6 h	36.0 ± 2.9	3.39 ± 0.35	4.33 ± 0.51	1.057 ± 0.007
	24 h	46.4 ± 7.7	3.13 ± 0.47	4.24 ± 0.62	1.030 ± 0.004
10 × 10	0	96.0 ± 4.2	4.84 ± 0.35	6.33 ± 0.46	1.0089 ± 0.0006
	5 min	86.0 ± 3.7	4.55 ± 0.33	6.45 ± 0.55	1.0101 ± 0.0009
	15 min	80.1 ± 6.3	4.68 ± 0.26	6.13 ± 0.31	1.0082 ± 0.0006
	1 h	149 ± 23	6.45 ± 0.89	10.0 ± 1.6	1.0107 ± 0.0009
	2 h	82.8 ± 39.0	5.00 ± 0.32	7.05 ± 0.41	1.0054 ± 0.0005
	6 h	343 ± 45	17.1 ± 2.2	24.4 ± 3.1	1.058 ± 0.005
	24 h	329 ± 44	20.3 ± 2.4	28.4 ± 3.5	1.051 ± 0.005

Table S4. Topography parameters of the coarse grained (CG) titanium surface etched in NH₄OH/H₂O₂ solutions.

Scan Area, μm	Etching Time	R _{max} , nm	R _a , nm	RMS, nm	S _{surf}
1 × 1	0	19.6 ± 1.4	1.84 ± 0.17	2.33 ± 0.21	1.029 ± 0.002
	5 min	102 ± 7	7.84 ± 1.30	9.37 ± 0.81	1.030 ± 0.003
	15 min	105 ± 9	9.22 ± 0.78	11.9 ± 0.9	1.323 ± 0.027
	1 h	94.8 ± 4.7	10.0 ± 0.5	12.7 ± 0.7	1.158 ± 0.016
	2 h	77.3 ± 8.2	8.14 ± 0.91	10.5 ± 1.3	1.088 ± 0.007
	6 h	170 ± 20	19.1 ± 2.7	24.6 ± 3.2	1.276 ± 0.023
	24 h	70.5 ± 9.7	7.71 ± 1.1	10.0 ± 1.8	1.069 ± 0.005
10 × 10	0	96.0 ± 4.2	4.84 ± 0.35	6.33 ± 0.46	1.0089 ± 0.0006
	5 min	289 ± 11	19.4 ± 1.0	25.8 ± 1.2	1.0686 ± 0.0043
	15 min	303 ± 26	17.2 ± 1.3	23.9 ± 1.8	1.079 ± 0.005
	1 h	368 ± 21	27.6 ± 1.8	36.3 ± 1.9	1.098 ± 0.012
	2 h	830 ± 76	67.0 ± 7.0	95.1 ± 9.9	1.130 ± 0.016
	6 h	830 ± 69	68.7 ± 5.2	87.7 ± 6.1	1.299 ± 0.031
	24 h	690 ± 38	56.1 ± 2.8	77.8 ± 4.1	1.087 ± 0.004