

Supporting Information

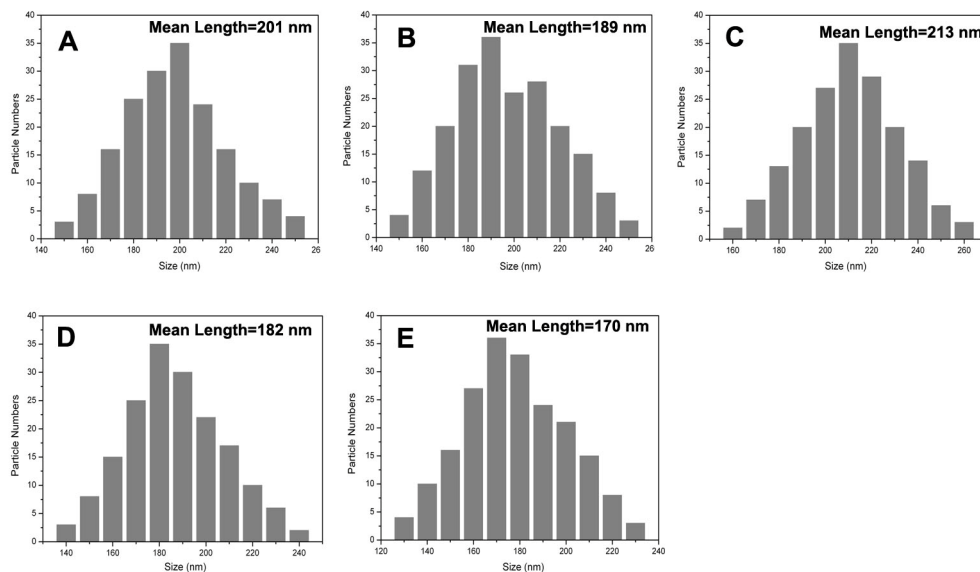


Figure S1. Histogram showing the length distribution of the NaLnF₄ nanorices: (A) NaNdF₄ (B) NaSmF₄, (C) NaEuF₄, (D) NaTbF₄, and (E) NaHoF₄.

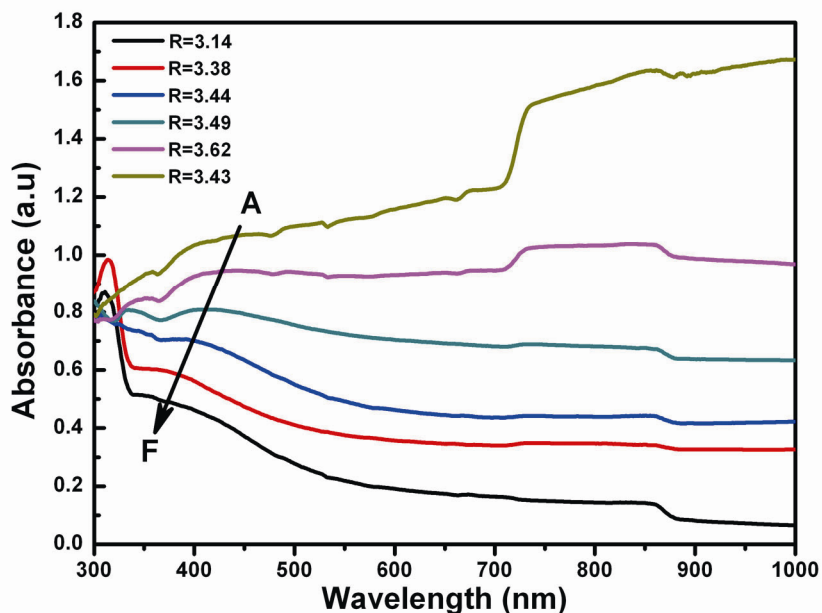


Figure S2. UV/vis absorption spectra of the samples prepared at different sputtering powers for 30 s: (A) 30 W, (B) 50 W, (C) 70 W, (D) 90 W, (E) 120 W, (F) 150 W; Where R is the aspect ratio of the nanorices.

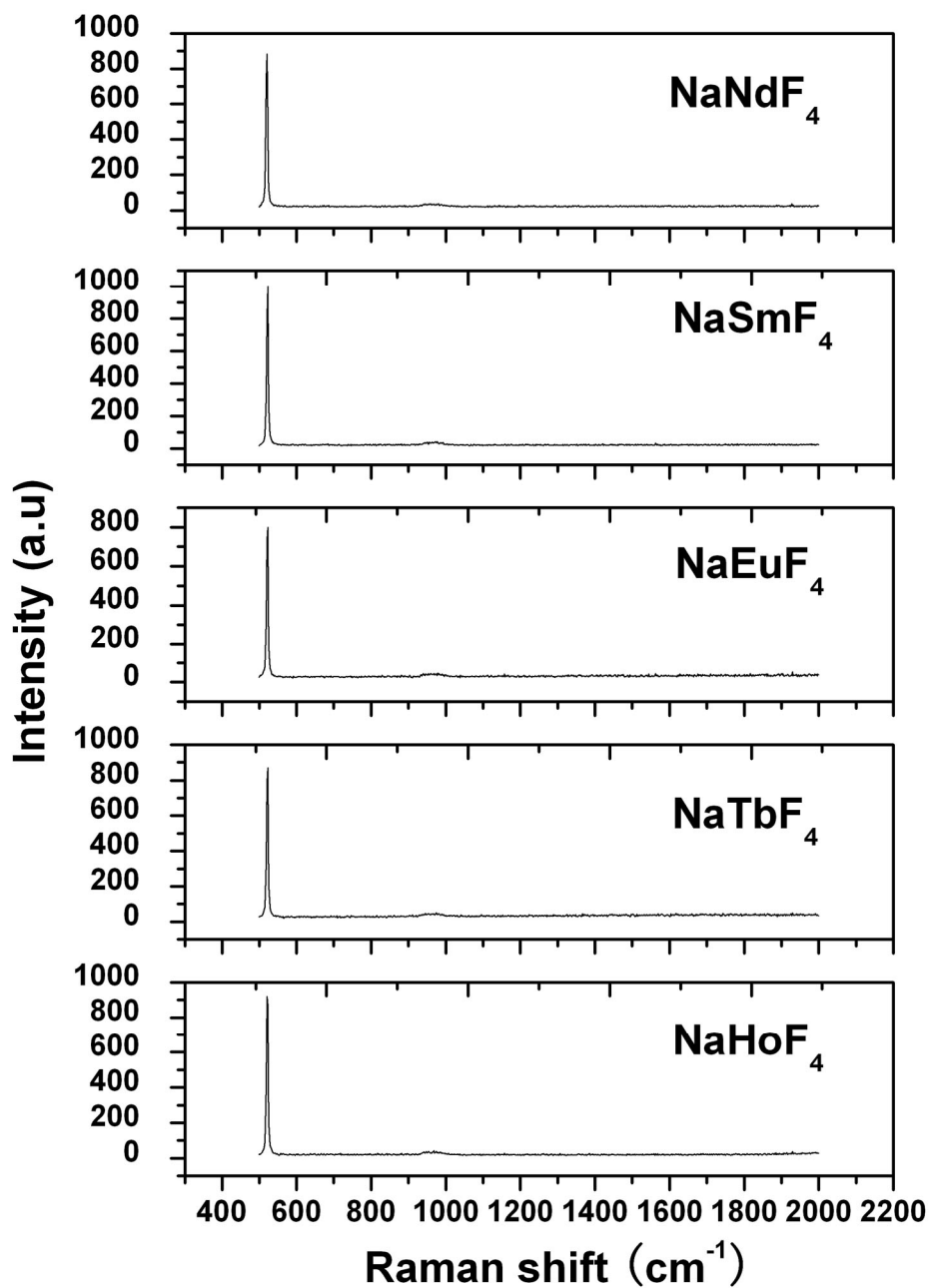


Figure S3. Raman spectra of five pure NaLnF₄ (Ln = Nd, Sm, Eu, Tb, Ho) nanorices assembled on silicon wafers. The two peaks were attributed to silicon wafers signals. No fluorescence emission of NaLnF₄ was detected.

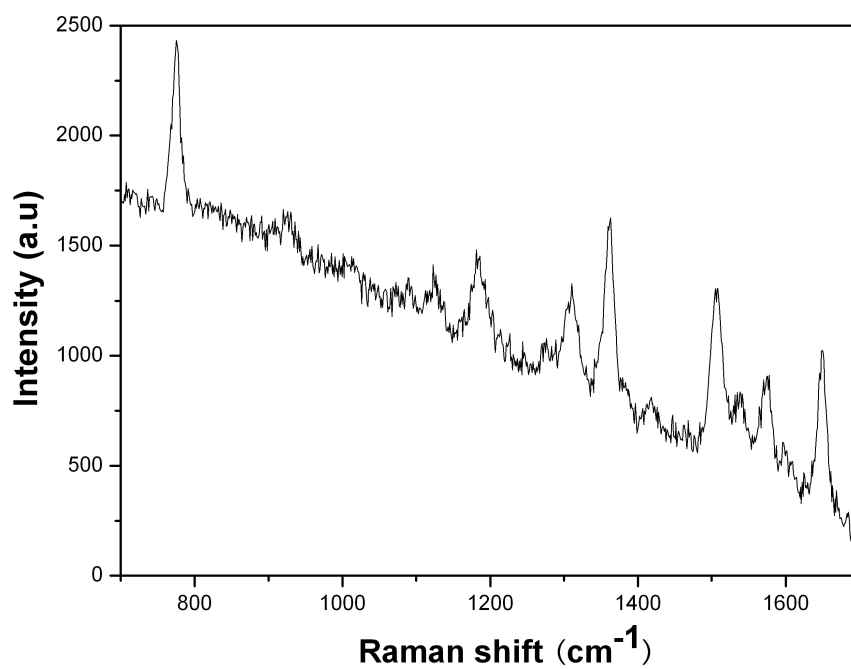


Figure S4. The Raman spectrum of 2 mM aqueous R6G solution. The excitation power is 0.5 mW and the integration time is 60 s.

Table S1. Values of the diameter (D), length (L), shell thickness (d), and aspect ratio (R) of the nanorices prepared at a power of 50 W for different sputtering times (T).

Sample	<i>T</i> /s	<i>D</i> /nm	<i>L</i> /nm	<i>d</i> /nm	<i>R</i>
T0	0	55.3 ± 3.2	189.8 ± 7.1	0	3.43
T1	10	—	189.8 ± 7.1	—	3.43
T2	30	58.3 ± 2.9	211.8 ± 8.9	3.0 ± 0.3	3.63
T3	60	60.9 ± 3.5	218.1 ± 9.2	5.6 ± 0.3	3.58
T4	90	66.1 ± 3.4	226.9 ± 9.0	10.8 ± 0.2	3.43
T5	120	72.4 ± 3.9	235.5 ± 9.8	17.1 ± 0.7	3.25
T6	150	74.2 ± 4.4	233.9 ± 10.2	18.9 ± 1.2	3.15

Table S2. Values of the diameter (D), length (L), shell thickness (d), and the aspect ratio (R) of the nanorices prepared at different sputtering powers (P) for 30 s.

Sample	<i>P</i> /W	<i>D</i> /nm	<i>L</i> /nm	<i>d</i> /nm	<i>R</i>
P0	0	55.3 ± 3.2	189.8 ± 7.1	0	3.43
P1	30	—	189.8 ± 7.1	—	3.43
P2	50	56.8 ± 3.6	205.5 ± 9.1	1.5 ± 0.4	3.62
P3	70	60.3 ± 3.5	210.4 ± 6.0	5.0 ± 0.3	3.49
P4	90	64.6 ± 3.6	222.5 ± 9.9	9.3 ± 0.5	3.44
P5	120	67.8 ± 4.1	229.3 ± 5.8	12.5 ± 0.9	3.38
P6	150	72.9 ± 4.6	228.9 ± 10.5	17.6 ± 1.4	3.14

Table S3. Reproducibility data for all of the SERS substrates, including average values (AVERAGE) and standard deviation (STDEVP) for the values in Figure 6B.

	30 W	50 W	70 W	90 W	120 W	150 W
1	2203	4510	8012	14021	20330	19500
2	2287	4598	8089	13679	20875	19304
3	2245	4560	8124	14356	20137	19279
4	2301	4684	8019	14036	19883	19599
5	2178	4456	8310	13568	19347	18907
6	2140	4623	7923	14576	20578	19750
7	2220	4387	7845	13998	19298	18992
8	2196	4536	7795	13890	20768	19020
9	2165	4589	8145	14437	19547	18769
10	2293	4519	8058	14100	19987	19480
11	2234	4553	8134	13900	19789	18964
12	2208	4680	8281	14563	20112	19550
AVERAGE	2222	4558	8061	14094	20054	19259
STDEVP	47.5	79.2	143.6	301.9	478.6	294.8

Table S4. Enhancement factor (EF) of R6G molecules absorbed on different NaLnF₄/Ag nanorices substrates.

Substrate	EF
NaNdF ₄ /Ag	3.7×10 ¹³
NaSmF ₄ /Ag	3.2×10 ¹³
NaEuF ₄ /Ag	4.1×10 ¹³
NaTbF ₄ /Ag	3.6×10 ¹³
NaHoF ₄ /Ag	4.3×10 ¹³