## M. V. Gorbachevskiy, D. S. Kopitsyn, M. S. Kotelev, E. V. Ivanov, V. A. Vinokurov, A. A. Novikov Amplification of surface-enhanced Raman scattering by oxidation of capping agent on gold nanoparticles

**Electronic Supplementary Information** 



Figure S1 – Raman spectrum of 37%(v/v) H<sub>2</sub>O<sub>2</sub> aqueous solution

One major peak at 878 cm<sup>-1</sup> corresponding to O-O bond stretching can be found in spectra amplified by the hydrogen peroxide addition. Most often, it does not obstruct the interpretation of spectra.

Table S1 –	The comp	lete synthe	sis scheme

No	HAuCl <sub>4</sub> , 25 mM	- Sodium Citrate, - 60 mM	NaOH, 25 mM	Collected sample, µL	Added water, µL
			<u></u> , μL		
g0, seeds	71	88			
g1	40	40			
g2	40	40			
g3	40	40	60	2000	1500
g4	40	40	60		
g5	40	40	60		
g6	40	40	60	2000	1500
g7	40	40	60		
g8	40	40	60		
g9	40	40	60	2000	1500
g10	40	40	60		
g11	40	40	60		
g12	40	40	60	2000	1500
g13	40	40	60		
g14	40	40	60		
g15	40	40	60	2000	1500
g16	40	40	60		
g17	40	40	60		
g18	40	40	60		



Figure S2 – TEM of synthesized gold nanoparticles of 18<sup>th</sup> generation



Figure S3 – Map of SERS intensity of CV in dispersion versus time (spectra were acquired in every 23 seconds)



Raman shift, cm<sup>-1</sup> Figure S4 – Map of SERS intensity of R6G in dispersion versus time (spectra were acquired in every 23 seconds)

Figures S3 and S4 correspond to Figure 1B in manuscript.



Figure S5 – Map of SERS intensity of CV on solid substrate with 3 % H<sub>2</sub>O<sub>2</sub> solution versus time (spectra were acquired in every 9 seconds)



Raman shift, cm-1

Figure S6 – Map of SERS intensity of CV on solid substrate versus time (spectra were acquired in every 9 seconds)

Figures S5 and S6 correspond to Figure 5 in manuscript.



Figure S7 – Raman intensities for selected peaks at various concentrations of rhodamine 6G (log-log scale; each point is calculated from 10 spectra; points are shown down to the lowest detectable dye concentration; error bars correspond to the standard deviation)



Figure S8 – Raman intensities for selected peaks at various concentrations of crystal violet (log-log scale; each point is calculated from 10 spectra; points are shown down to the lowest detectable dye concentration; error bars correspond to the standard deviation)