Supplementary Information for

High Catalytic Performance of Raspberry-Like Gold Nanoparticles and Enhancement of Stability by Silica Coating

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Figure S1. (a) Size distribution of Au RLNP s; (b) Powder X-ray diffraction (PXRD) pattern of Au RLNP s (red line) and the pattern of fcc structure of metallic gold (JCPDS card No. 04-0784, blue line)
Figure S2. SEM (up) and TEM (down) images of Au RLNPs@SiO$_2$ NPs
Figure S3. FT-IR spectra of (i) Au RLNPs and (ii) Au RLNPs@SiO$_2$ NPs in KBr pellets.
Figure S4. UV-Vis spectral changes of Au RLNPs before (black) and after the addition of (a) 200, (b) 100, (c) 50, and (d) 10 mM of CTAB (aq) (100 µL) into the dispersion of as-synthesized Au RLNPs in nanopure water (1 mL) corresponding to each reaction time.
Figure S5. UV-Vis spectral changes of Au RLNPs before (black) and after the addition of 1, 5, 10, and 25 µL of mercaptosiliane (MPTS) (95 %) into the dispersion of as-synthesized Au RLNPs in ethanol (1 mL). (UV-Vis spectra were observed in water after 24 hours reactions.)
Figure S6. UV-Vis spectra showing the reduction reaction of 4-nitrophenol (4-NP) over (a) Au RLNPs; (b) HCl-treated Au RLNPs; (c) Au RLNPs@SiO$_2$; (d) HCl-treated Au RLNPs@SiO$_2$. 
Figure S7. Plot of ln(C/C₀) versus time for (a) Au RLNPs; (b) HCl-treated Au RLNPs; (c) Au RLNPs@SiO₂; (d) HCl-treated Au RLNPs@SiO₂ NPs. The rate constants in different systems calculated based on the slope of the linear fit of –ln(C₀/C) versus time are (a) 6.7x10⁻³, (b) 2.5x10⁻³ s⁻¹, (c) 2.6x10⁻³, and (d) 3.3x10⁻³ s⁻¹.
Figure S8. Histogram comparing the catalytic performance of Au RLNPs and Au RLNPs@SiO$_2$ based on the conversion of 4-NP. (Conversion of 4-NP = 1 – $C_t/C_0$)