Supporting Information

One–pot facile synthesis of reusable tremella-like $M_1@M_2@M_1(OH)_2$ (M_1=Co, Ni, M_2=Pt/Pd, Pt, Pd and Au) three layers core-shell nanostructures as highly efficient catalysts

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Figure S1

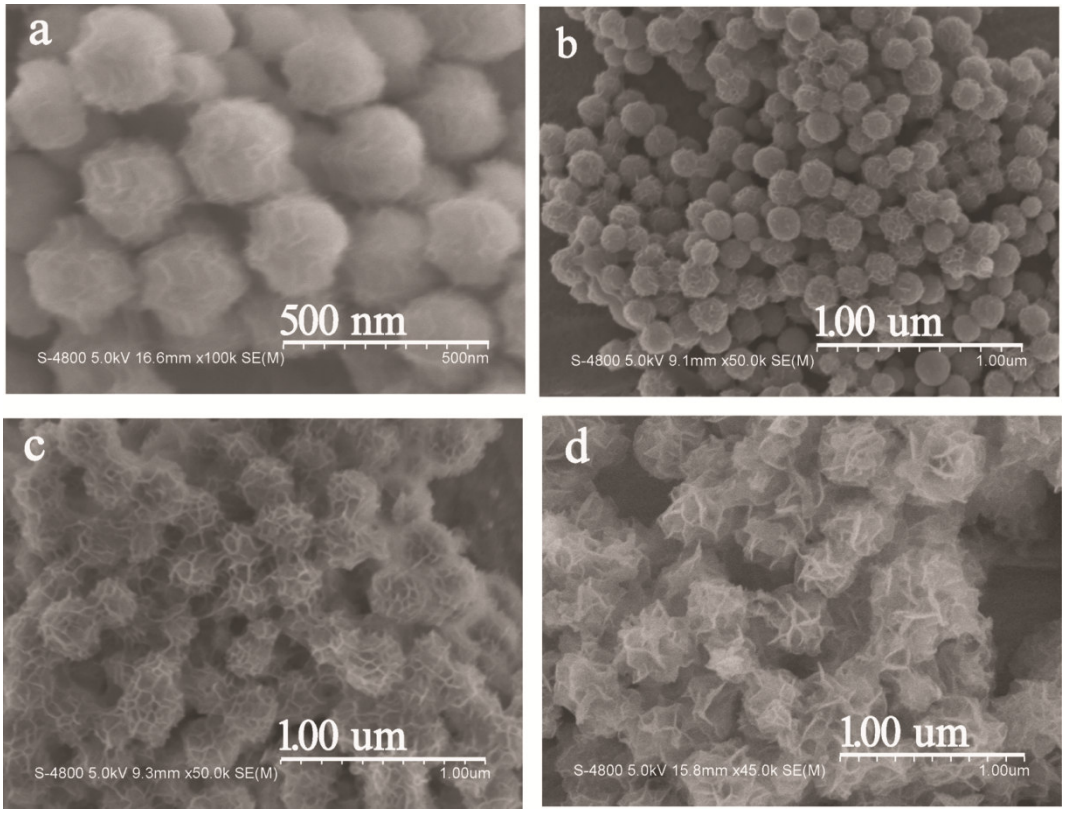

Figure S1. SEM images of $Co@Pt@Co(OH)_2$ core-shell nanostructures: high (a) and low (b) magnification SEM images of composites with $Co(OH)_2$ nanosheets less loaded when the reaction time of last step was short; (c) and (d) low–magnification SEM images of composites with $Co(OH)_2$ nanosheets thicker loaded when the reaction temperature raised to 30 °C and 40 °C respectively.

Figure S2

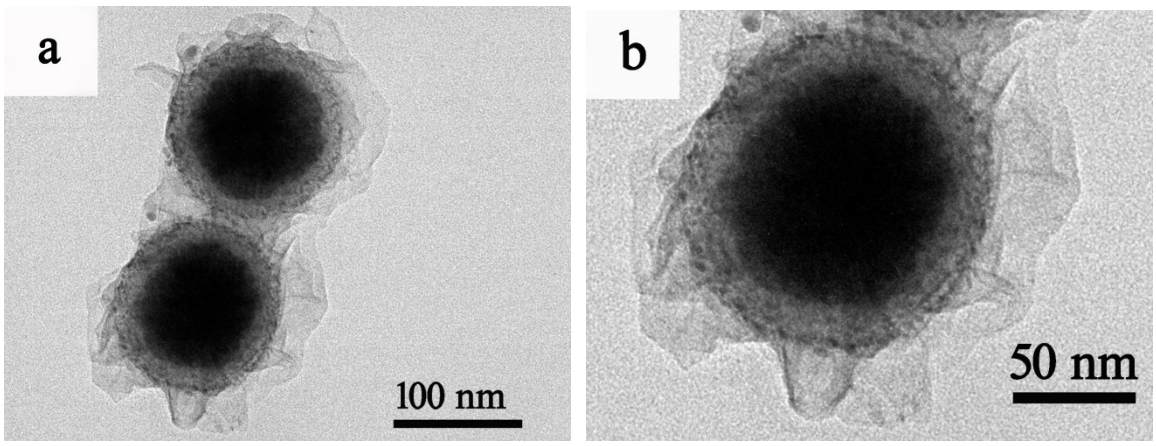

Figure S2. TEM images of Co@Pt/Pd@$Co(OH)_2$ core-shell nanostructures.

Figure S3

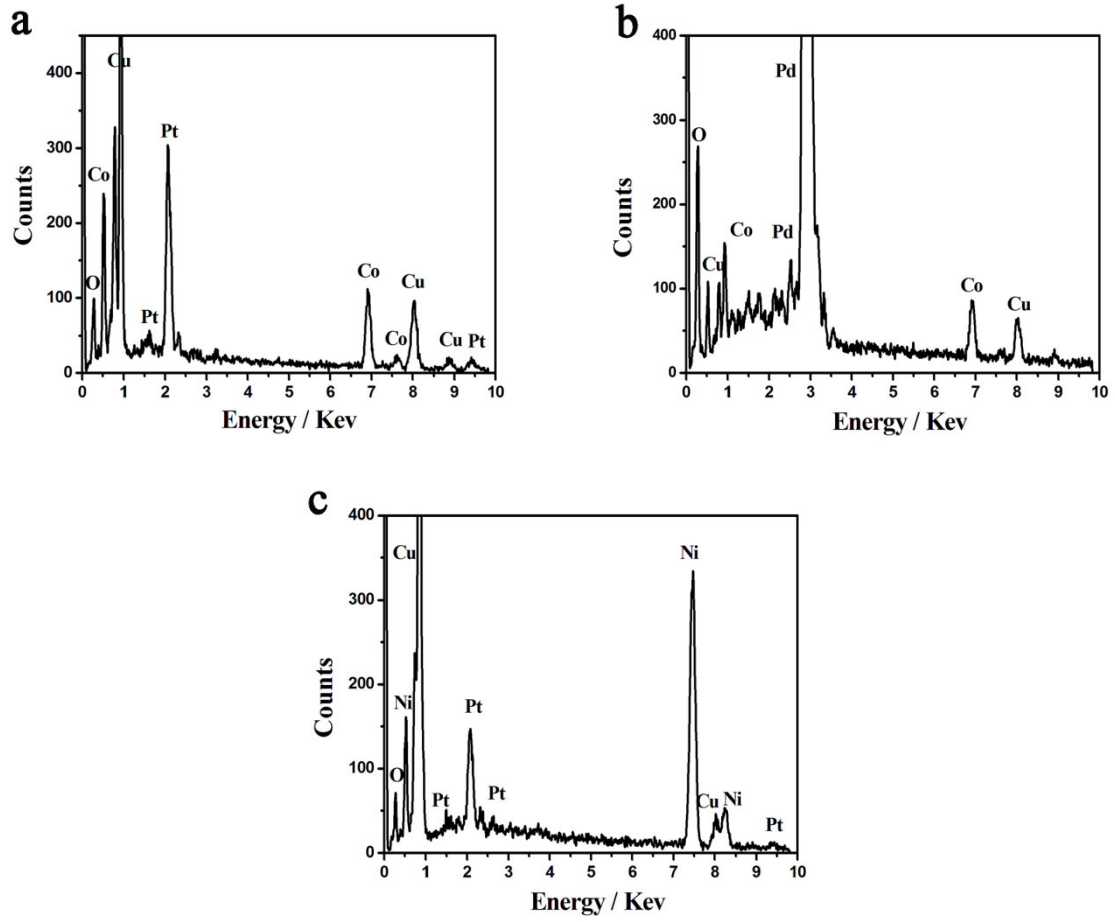

Figure S3. EDS analysis of as- prepared core-shell nanostructures: (a) Co@Pt@$Co(OH)_2$ composites; (b) Co@Pd@$Co(OH)_2$ composites; (c) Ni@Pt@$Ni(OH)_2$ composites.

Figure S4

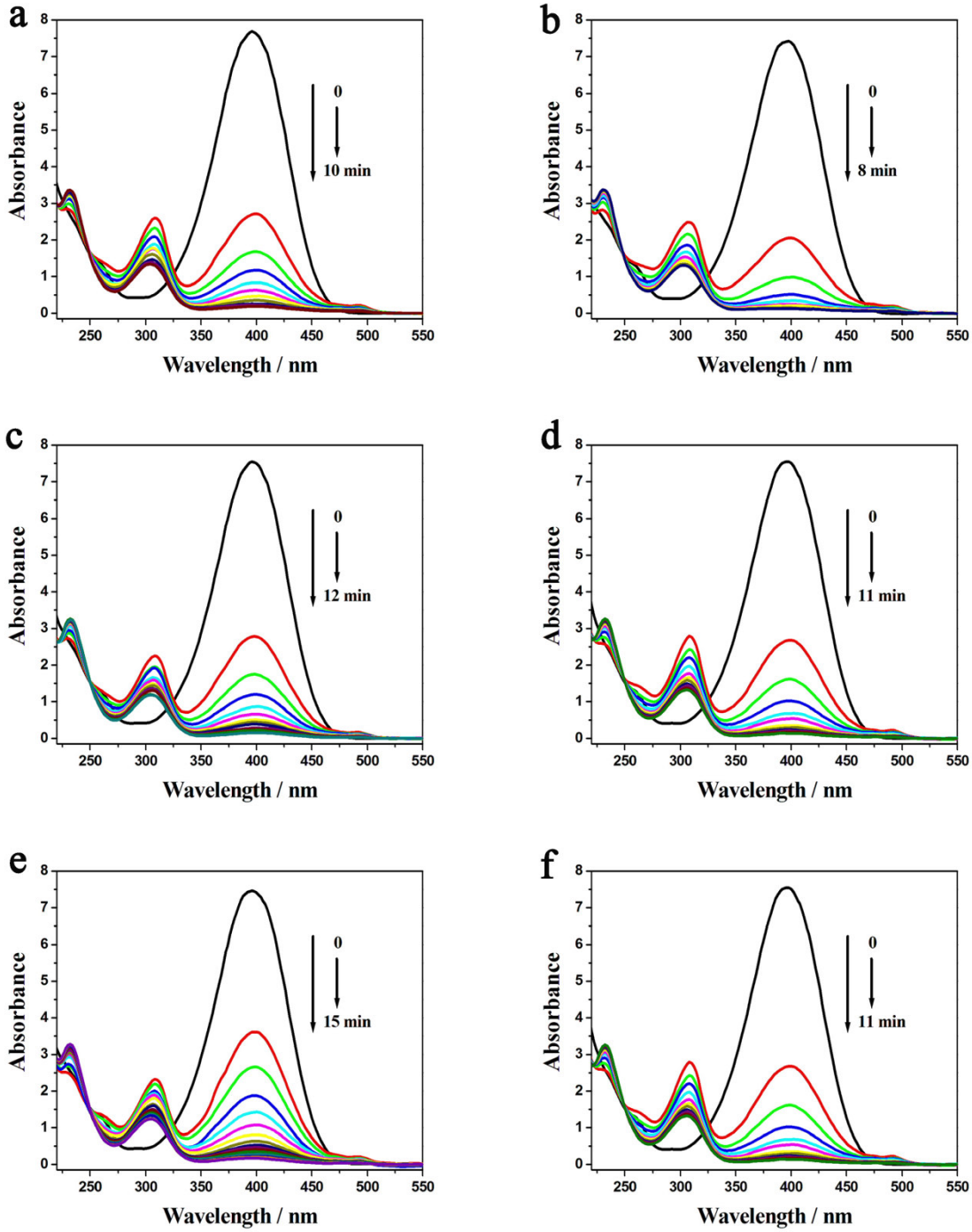

Figure S4. Time-dependent UV-vis spectral changes in 4-nitrophenol (4-NP) catalyzed by (a) 0.035 mg and (b) 0.05mg Co@Pd@$Co(OH)_2$ catalysts, (c) 0.035 mg and (d) 0.05mg Co@Pt@$Co(OH)_2$ catalysts, (e) 0.035 mg and (f) 0.05mg Co@Au@$Co(OH)_2$ catalysts.

Figure S5

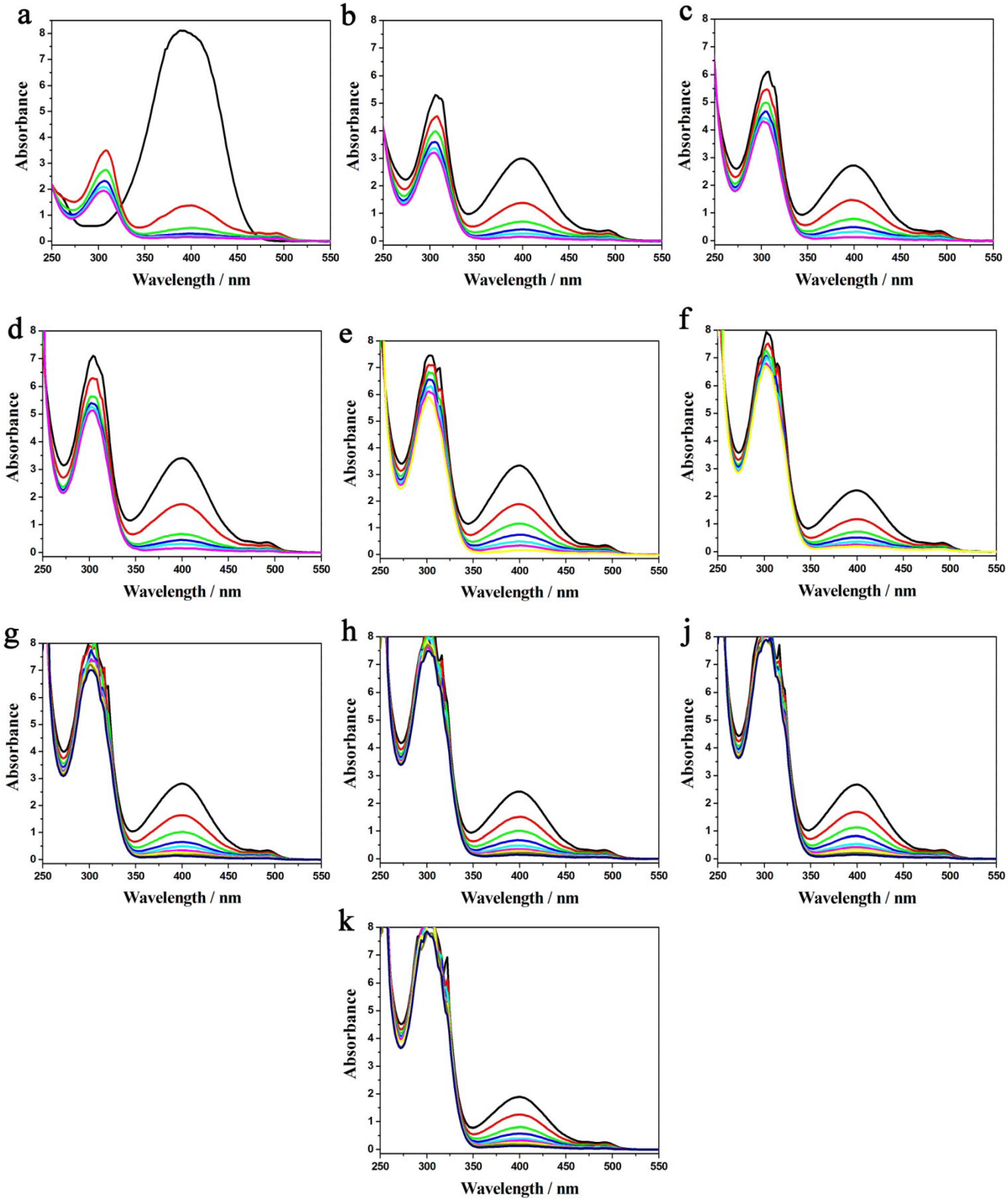

Figure S5. Time-dependent UV-vis spectral changes in ten successive cycles 4-nitrophenol (4-NP) catalyzed reduction reaction with 0.05 mg Co@Pt/Pd@Co(OH)$_2$ catalysts.

Figure S6

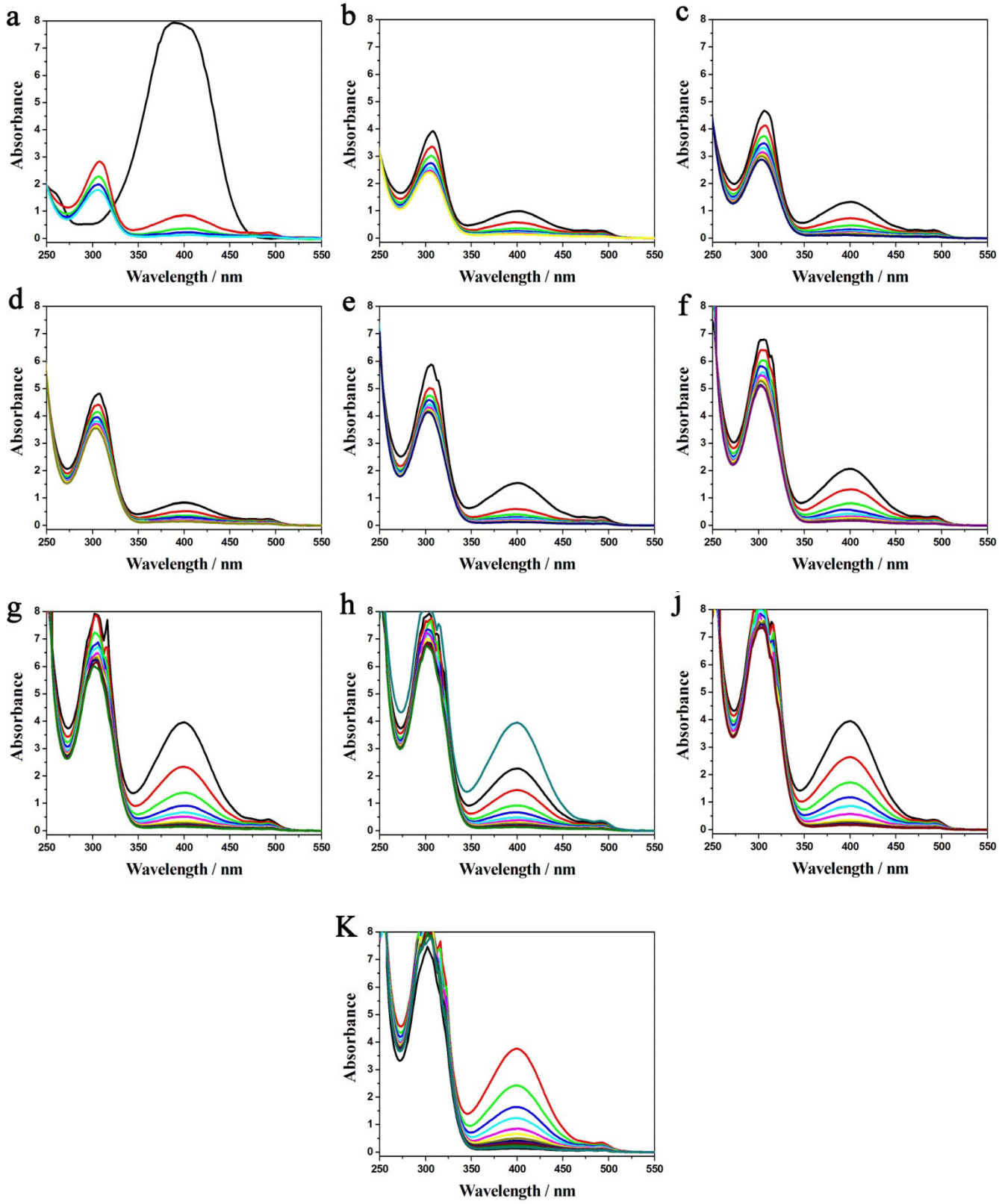

Figure S6. Time-dependent UV-vis spectral changes in ten successive cycles 4-nitrophenol (4-NP) catalyzed reduction reaction with 0.05 mg Co@Pt/Pd catalysts.