Electronic Supplementary Information

Phytochemical Assisted Synthesis of Size and Shape Tunable Gold Nanoparticles and Assessment of Their Catalytic Activities

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Phytochemical analysis–Determination of total phenolic content in the extract

The amount of total phenolics in the extract was determined with the Folin–Ciocalteu reagent following a previously reported method (M. Savitree, P. Isara, S. L. Nittaya and S. Worapan, *J. Pharm. Science*, 2004, **9**, 32). Gallic acid was used as a standard and the total phenolics were expressed as mg/g gallic acid equivalents (GAE). Solution of gallic acid of concentrations; 0.01, 0.02, 0.03, 0.04 and 0.05 mg/ml were prepared in water. Subsequently, aqueous solution of plant extract of concentrations 0.1 and 1.0 mg/ml were also prepared. In separate labelled test tubes, 0.5 ml of each samples were introduced and mixed with 2.5 ml of a 10 fold diluted Folin–Ciocalteu reagent in water and 2 ml of 7.5 wt% aqueous sodium carbonate solution. The solutions were mixed properly and were kept in dark in static condition for 30 minutes at room temperature. The absorbance of all the mixtures were measured at 750 nm spectrometrically against the blank sample made by mixing 2.5 ml of a 10 fold diluted Folin–Ciocalteu reagent in water, 2 ml of 7.5 wt% aqueous sodium carbonate solution and 0.5 ml water. A calibration curve was plotted (R^2= 0.994) with the series of gallic acid standards from which the total phenolic contents values were determined. Results are expressed as mg of gallic acid equivalents (GAE).

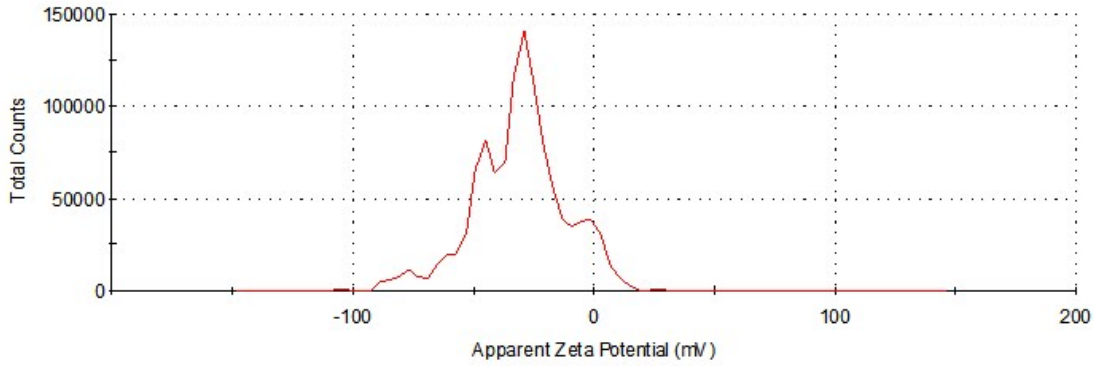

Figure S1. Zeta potential curve recorded from sample Ex-Au-1.

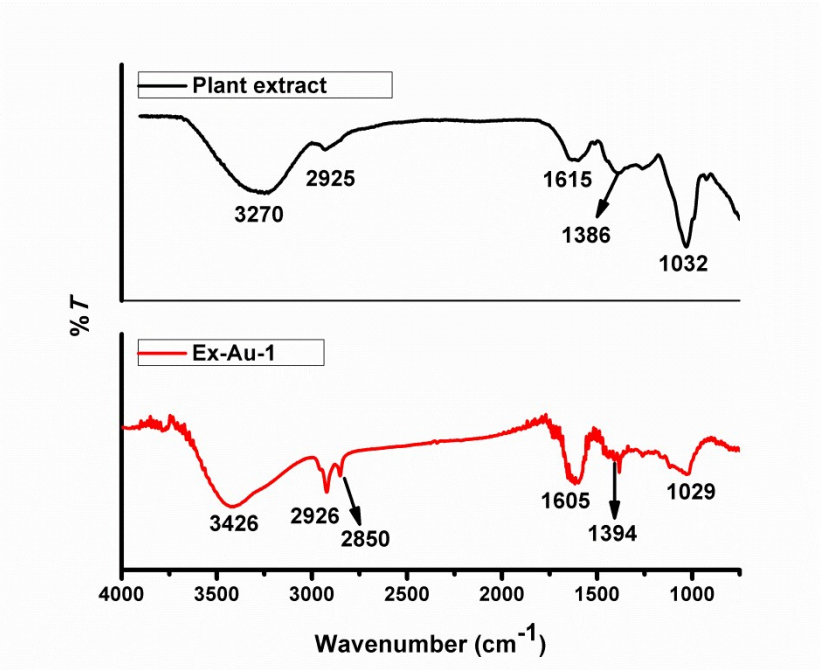

Figure S2. FTIR spectra of extract and GNPs prepared using extract (sample Ex-Au-1).

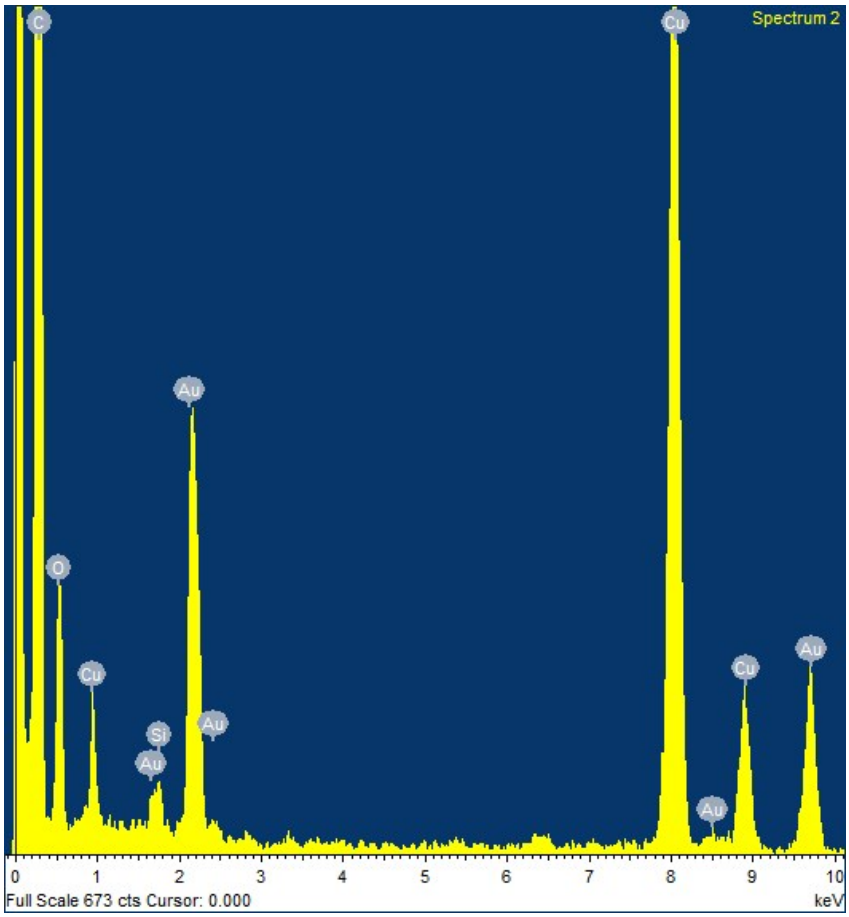

Figure S3. Energy dispersive X-ray spectra of GNPs prepared using extract (sample Ex-Au-1).

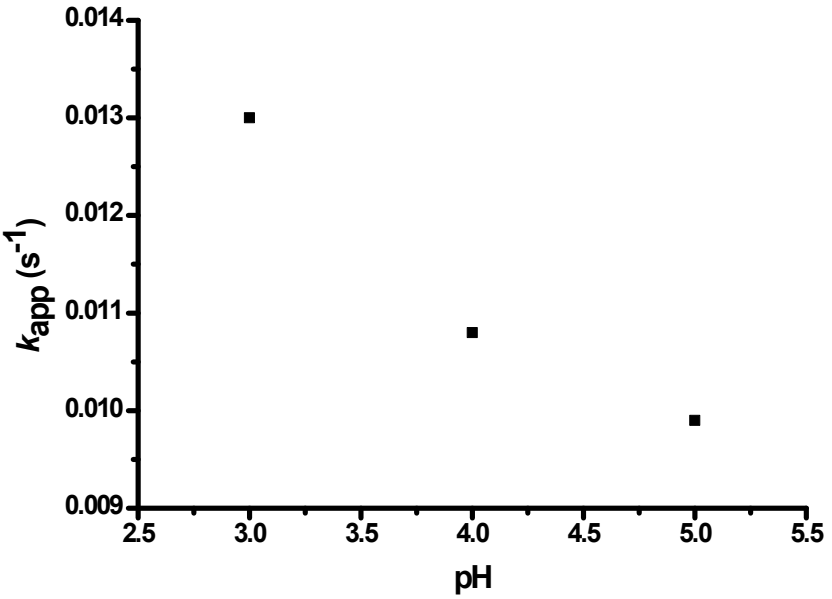

Figure S4. Variation of reaction rate of borohydride reduction of *p*-nitrophenol with pH (sample Ex-Au-1).

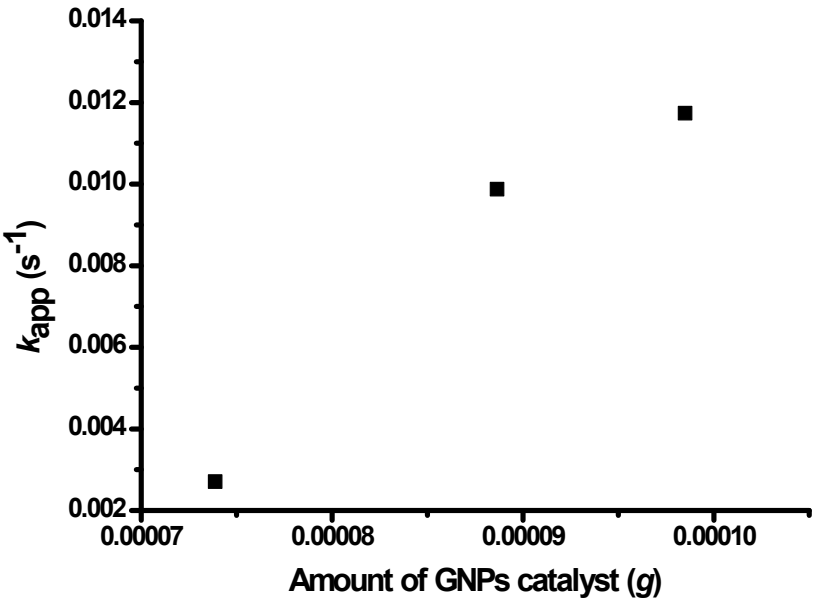

Figure S5. Variation of reaction rate of borohydride reduction of *p*-nitrophenol with amount of GNPs catalyst (sample Ex-Au-1).

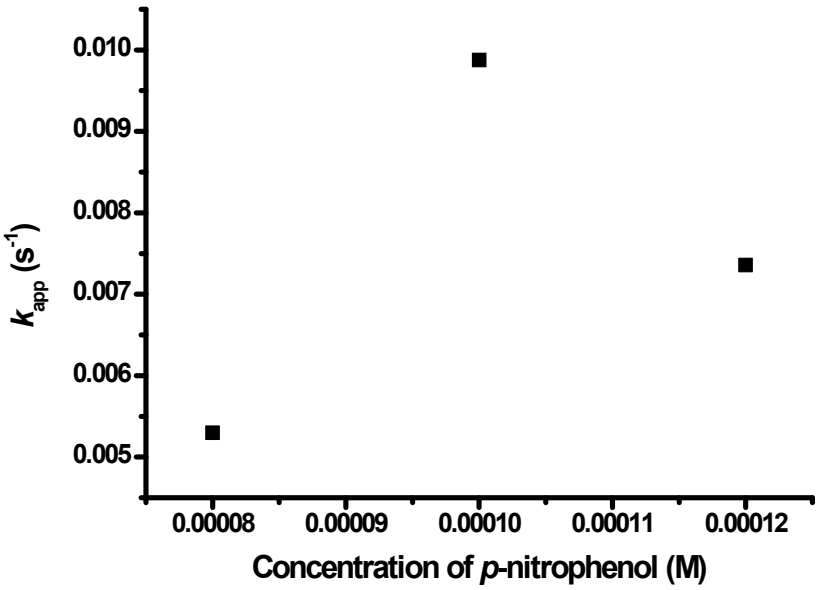

Figure S6. Variation of reaction rate of borohydride reduction of *p*-nitrophenol with concentration of *p*-nitrophenol (sample Ex-Au-1).

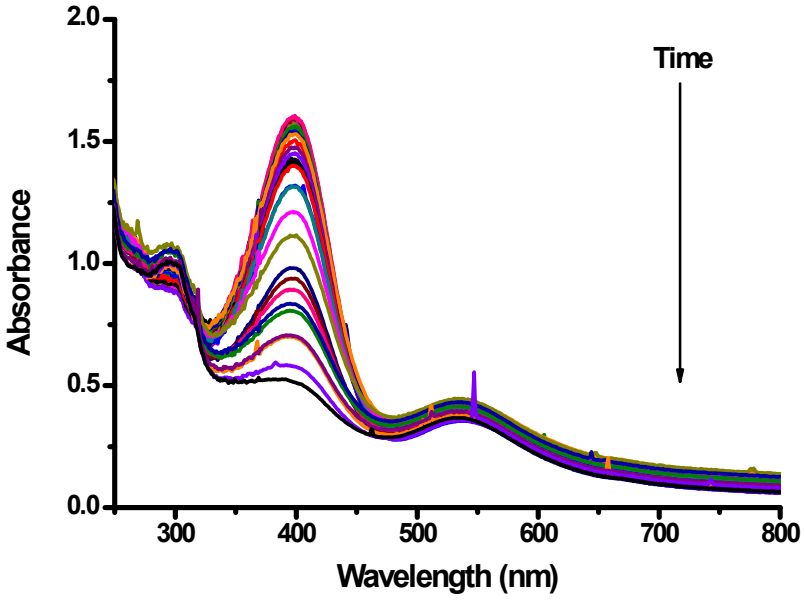

Figure S7. Successive UV-vis absorption spectra of the borohydride reduction of *p*-nitrophenol catalyzed by regenerated GNPs (sample Ex-Au-1).

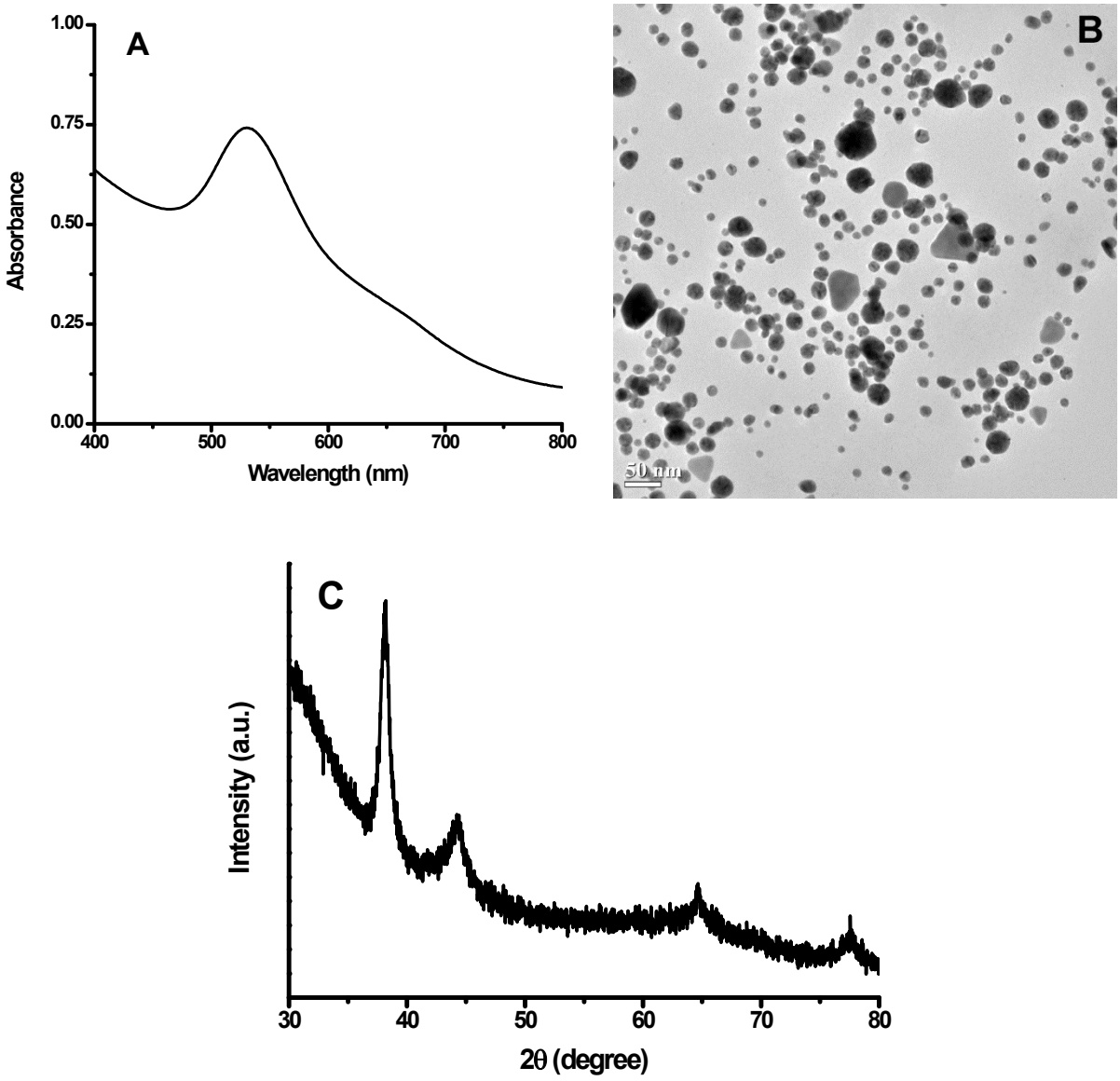

Figure S8. Uv-vis spectra (A), TEM image (B) and XRD pattern (c) of colloidal GNPs (sample Ex-Au-1) after first cycle of catalysis.

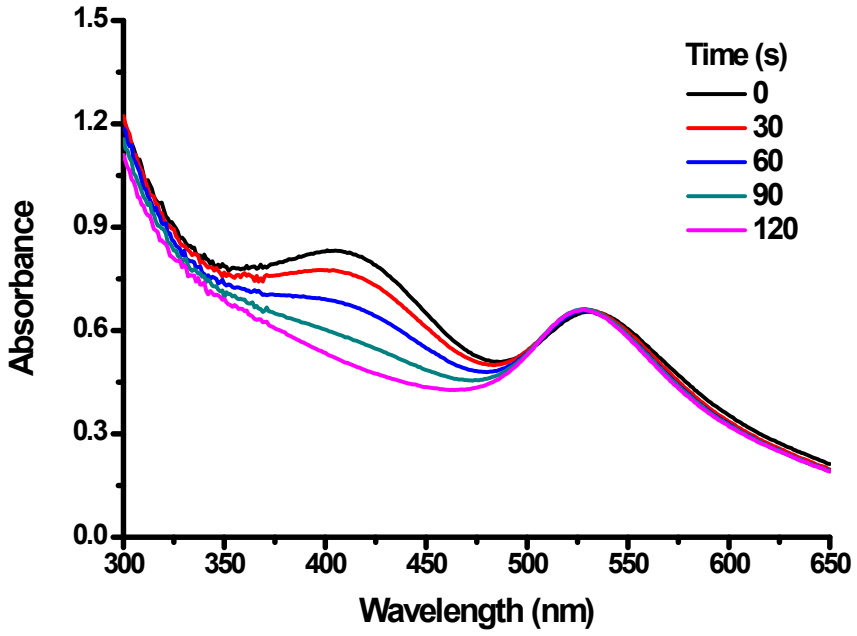

Figure S9. Successive UV-vis absorption spectra of the borohydride reduction of *o*-nitrophenol catalyzed by GNPs (sample Ex-Au-5).

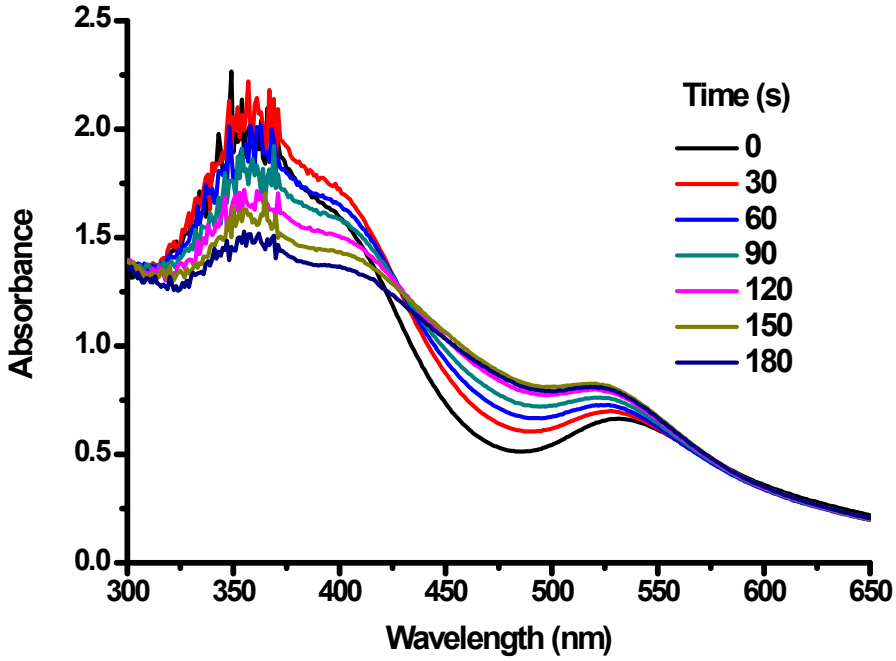

Figure S10. Successive UV-vis absorption spectra of the borohydride reduction of *m*-nitrophenol catalyzed by GNPs (sample Ex-Au-5).