# Electronic supplementary information (ESI)

# Enzyme mimicking inorganic hybrid Ni@$MnO_2$ for colorimetric detection of uric acid in serum sample

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**Catalytic Reduction of 4-Nitrophenol by Using Ni@$MnO_2$.**

Typically, 300 μL of $5 \times 10^{-2}$ M freshly prepared aqueous $NaBH_4$ solution was mixed with 3 mL aqueous solution of 4-nitrophenol ($1 \times 10^{-4}$ M) in a quartz cuvette under ambient condition. Then 1 mg of Ni@$MnO_2$ nanocatalyst was added to the reaction mixture and the progress of the reactions was recorded using a UV-vis spectrophotometer.

**Sample Preparation for Surface-Enhanced Raman Scattering (SERS) Study.**

In a typical procedure, 0.015 g of Ni@$MnO_2$ hybrid nanomaterials were dispersed in 1 mL of the stock solution of 1,10-phenanthroline ($10^{-5}$ M ethanolic solution) and this substrate-probe assembly was incubated for 2 days. Then the materials were taken on microscope slides, and dried to evaporate the solvent for SERS measurements using He-Ne laser (632.8 nm).

**Figure**

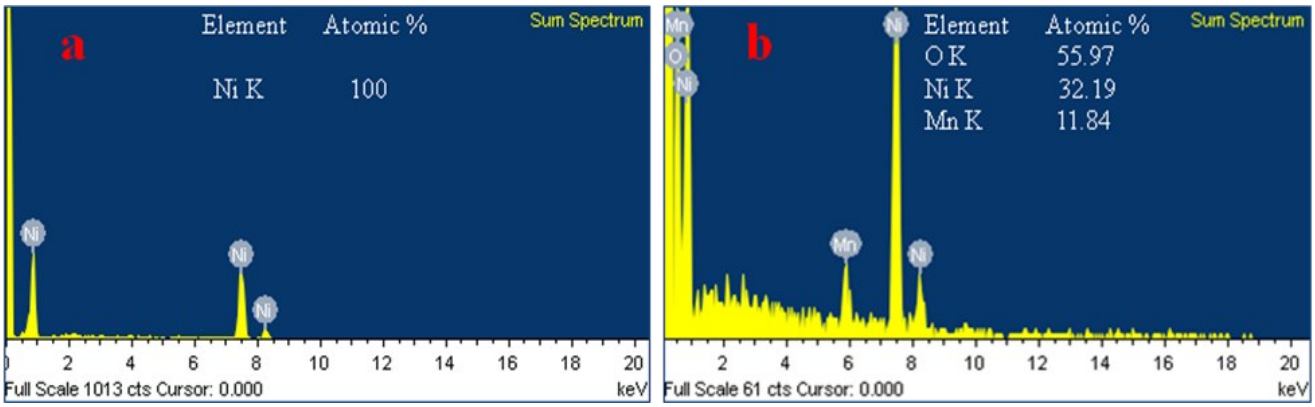


**Fig. S1** EDX analysis of (a) Ni NW and (b) Ni@$MnO_2$ hybrid nanomaterials, respectively.

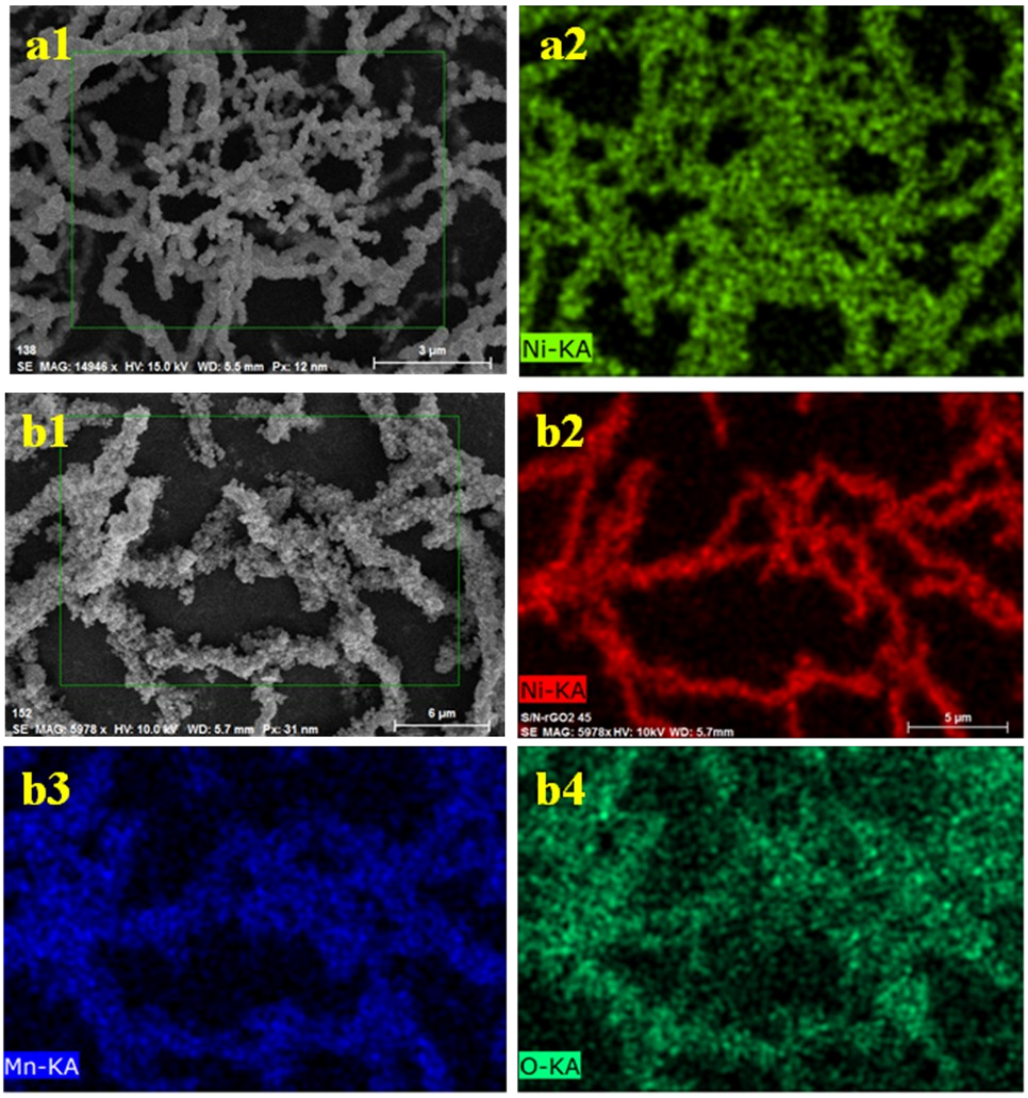


**Fig. S2** Area mapping of as-prepared (a1) prickly Ni NW: for the element Ni (a2). Area mapping of (b1) Ni-$MnO_2$ hybridnanomaterial: for the element Ni (b2), Mn (b3) and O (b4).

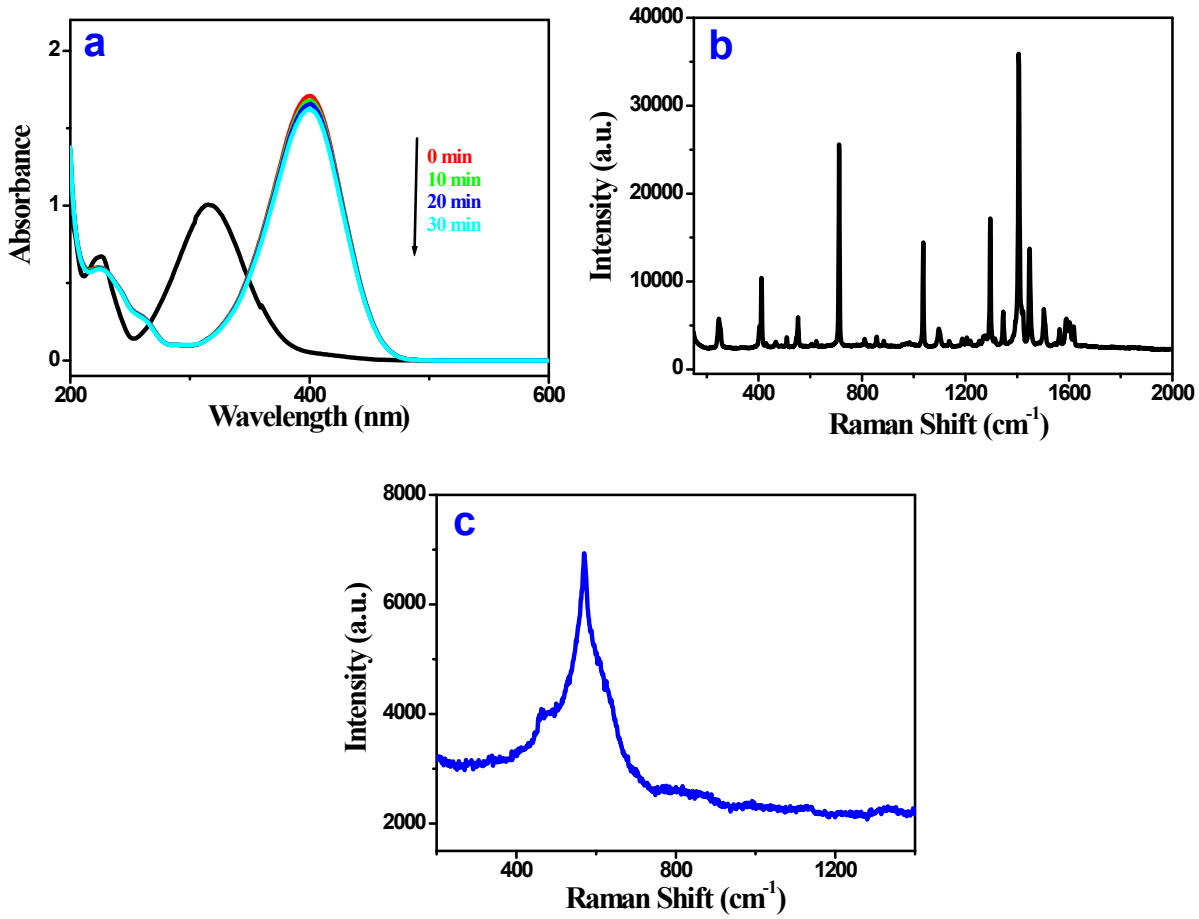


**Fig. S3** (a) UV-visible absorption spectra of the reduction of 4-nitrophenol by $NaBH_4$ in presence of 1 mg of $Ni@MnO_2$ catalyst. (b) Normal Raman spectra of 1,10-phenanthroline in solid state and (c) SERS spectra of $10^{-5}$ M 1,10-phenanthroline over $Ni@MnO_2$ nanoparticles.