Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary materials

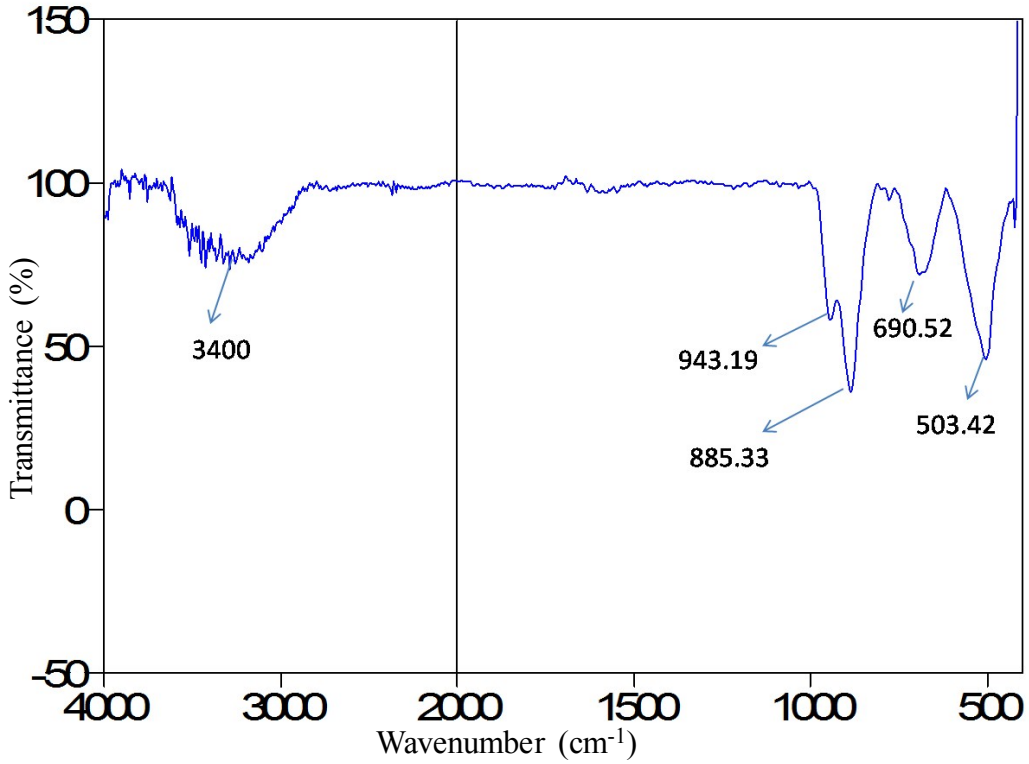

Fig. S1: FTIR spectrum of $Ag_2O{\cdot}SnO_2{\cdot}Cr_2O_3$ nanoparticle

Cyclic voltammetry and Impedance spectroscopy study:

It is investigated the electrode performance with $Ag_2O_3{\cdot}SnO_2{\cdot}Cr_2O_3$ NPs fabricated GCE and bare-GCE electrode by cyclic voltammetry (CV) and impedance spectroscopy study (EIS) in 5.0 mM $[Fe(CN)6]^{3-/4-}$ containing 0.1 M KCl. CVs of 5.0 mM $[Fe(CN)6]^{3-/4-}$ containing 0.1 M KCl were recorded separately using NPs-coated GCE and bare-GCE at a scan rate of 0.1 Vs^{-1}, which represented with red and blue color curves (Fig. S3a). Figure S3a shows that a bare GC electrode gives well-defined redox peaks while NPs/GCE provides low-currents response due to the slightly blocking the electrode surface. The NPs/GCE exhibited substantial redox currents in comparison with those exhibited by the GCE electrode, which demonstrated the most auspicious

catalytic performance in presence of 4-AP. The EIS spectra (5.0 mM $[Fe(CN)6]^{3-/4-}$ containing 0.1 M KCl) were recorded to explore the relative charge transfer of the modified electrodes with NPs coated and uncoated GCE as shown in Fig. S3b.

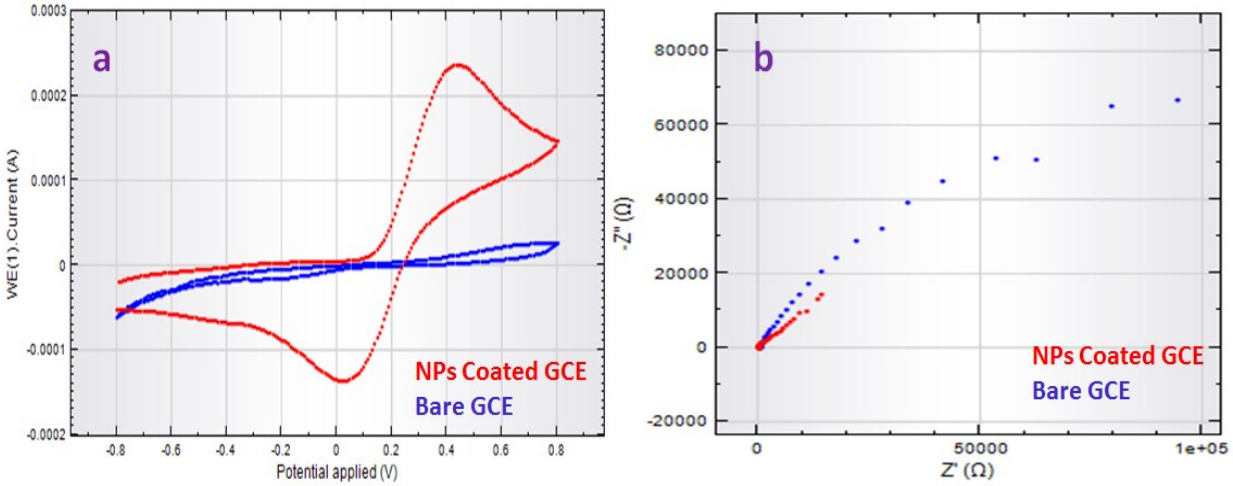

Fig. S2. (a) CV of bare and $Ag_2O{\cdot}SnO_2{\cdot}Cr_2O_3$ nanoparticles coated GCE and (b) EIS of bare and $Ag_2O{\cdot}SnO_2{\cdot}Cr_2O_3$ nanoparticles coated GCE in 5.0 mM $[Fe(CN)6]^{3-/4-}$ containing 0.1 M KCl.

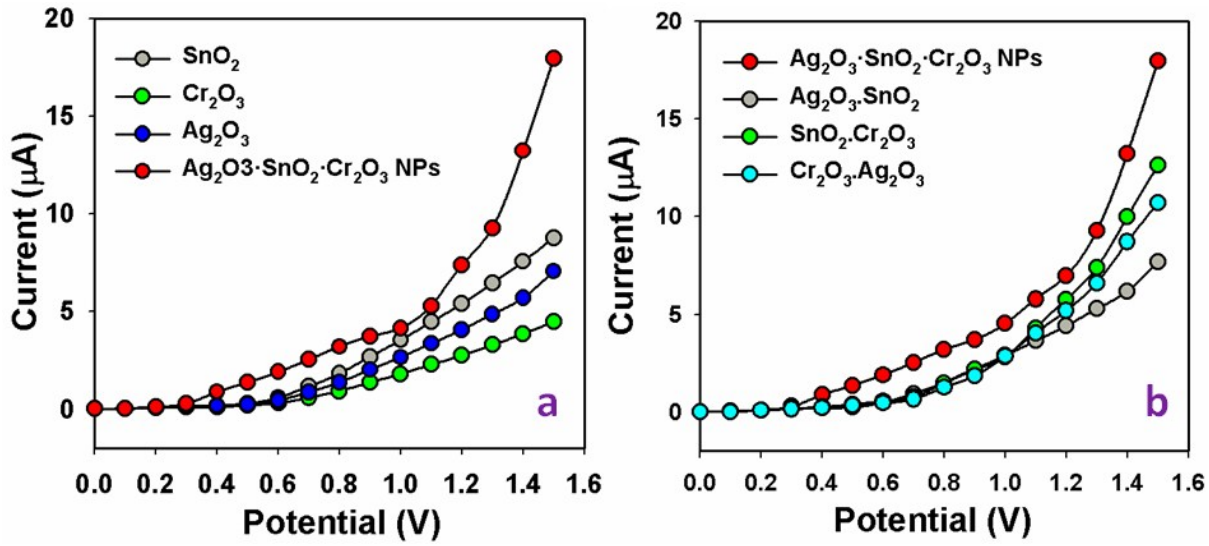

Fig. S3. Control experiment: Electrochemical 0.1μM 4-AP response with various modification of working GCE electrode in identical conditions. (a) Mono- and (b) Binary metal oxides responses and compared with the $Ag_2O_3 \cdot SnO_2 \cdot Cr_2O_3$ NPs.

Table S1: Excitation wavelength dependent emissions of $Ag_2O \cdot SnO_2 \cdot Cr_2O_3$ nanoparticle annealed at 600 °C

Excitation wavelength (nm)	**Emissions observed (nm)**
320	436,467
350	431,464
370	426,464
380	427,462

Table S2: Excitation wavelength dependent emissions of$Ag_2O \cdot SnO_2 \cdot Cr_2O_3$ nanoparticlesannealed at 850 °C

Excitation wavelength (nm)	**Emissions observed(nm)**
330	403, 426 and 454
340	404, 427 and 453
350	405, 426 and 452
370	405, 428 and 454