Highly selective colorimetric sensor of mercury(II) ions and hydrogen peroxide by biosynthesized silver nanoparticles in water and investigations of the interaction between silver-mercury

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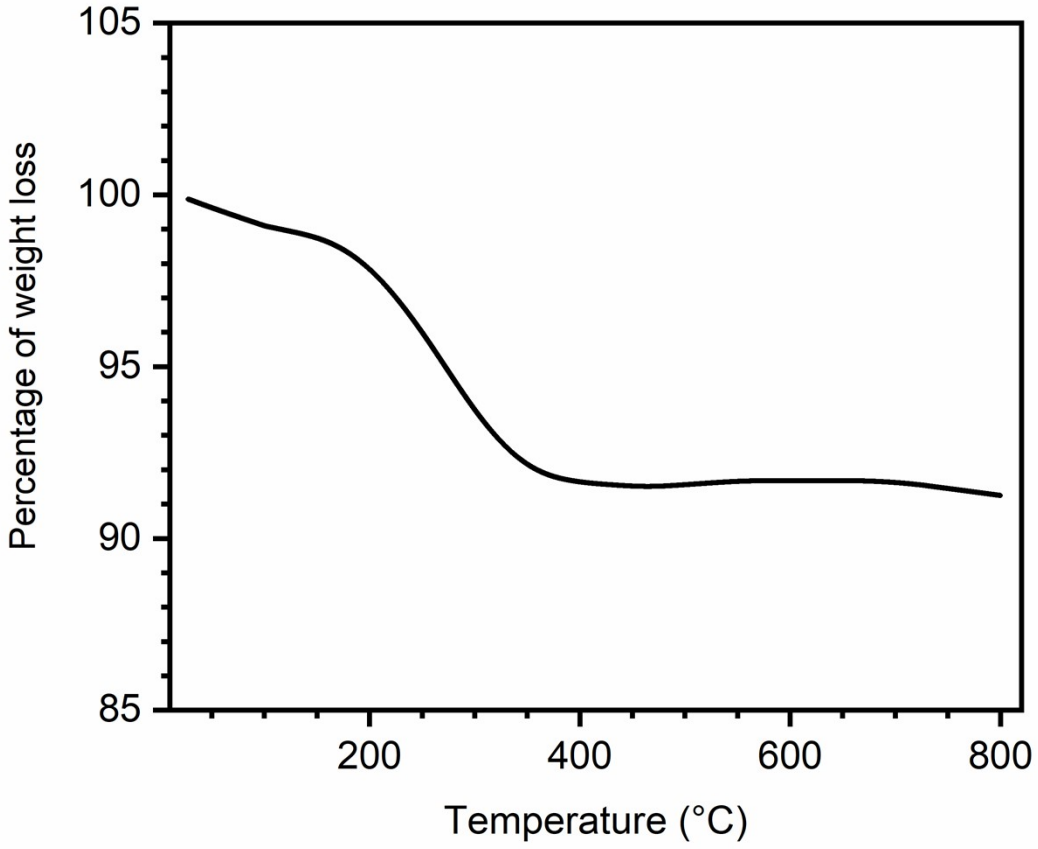

Figure S1. Thermogravimetric analysis (TGA) curve of AgNPs synthesized using Averrhoa bilimbi fruit extract at 60 °C and pH =10 for 30 min (Conditions: N_2 and 10 °C/min).

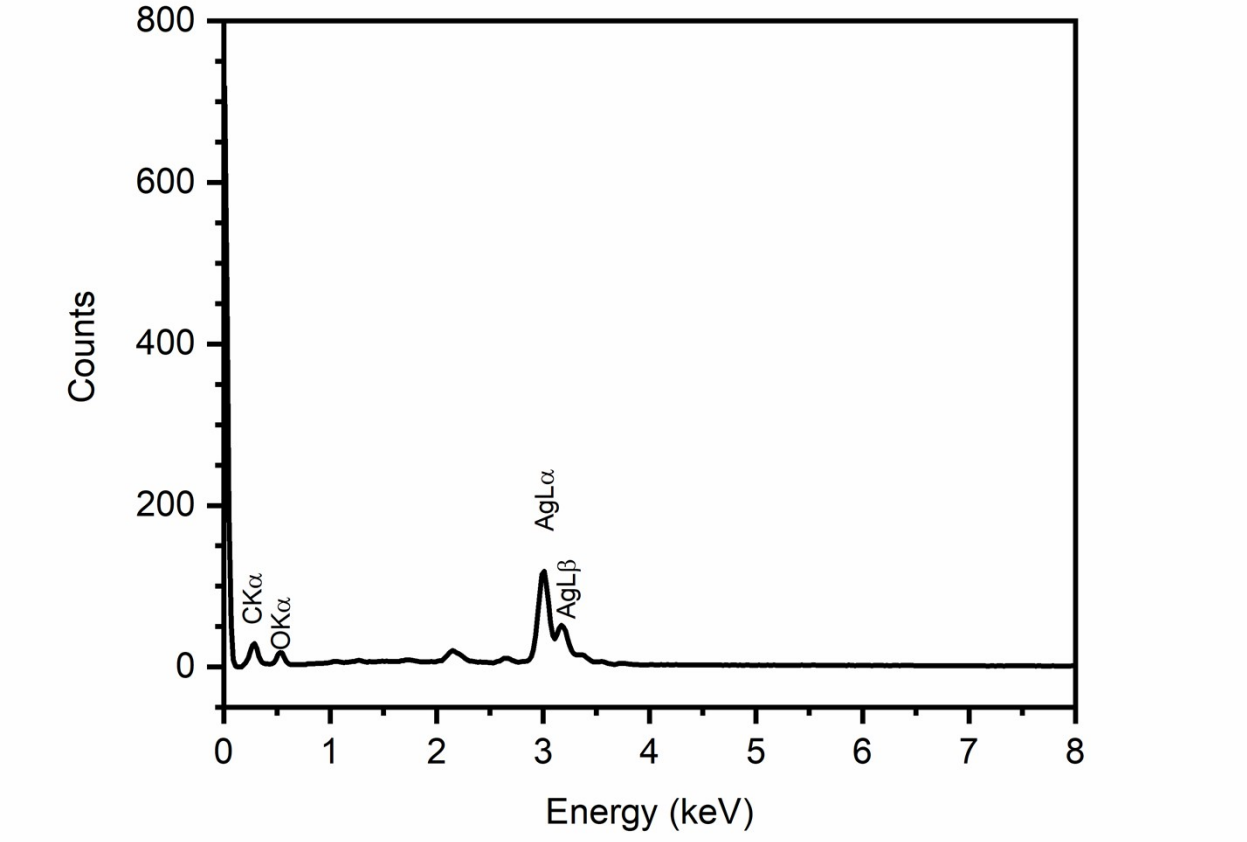

Figure S2. EDX spectrum of *AgNPs synthesized using Averrhoa bilimbi fruit extract at 60 °C and pH =10 for 30 min*

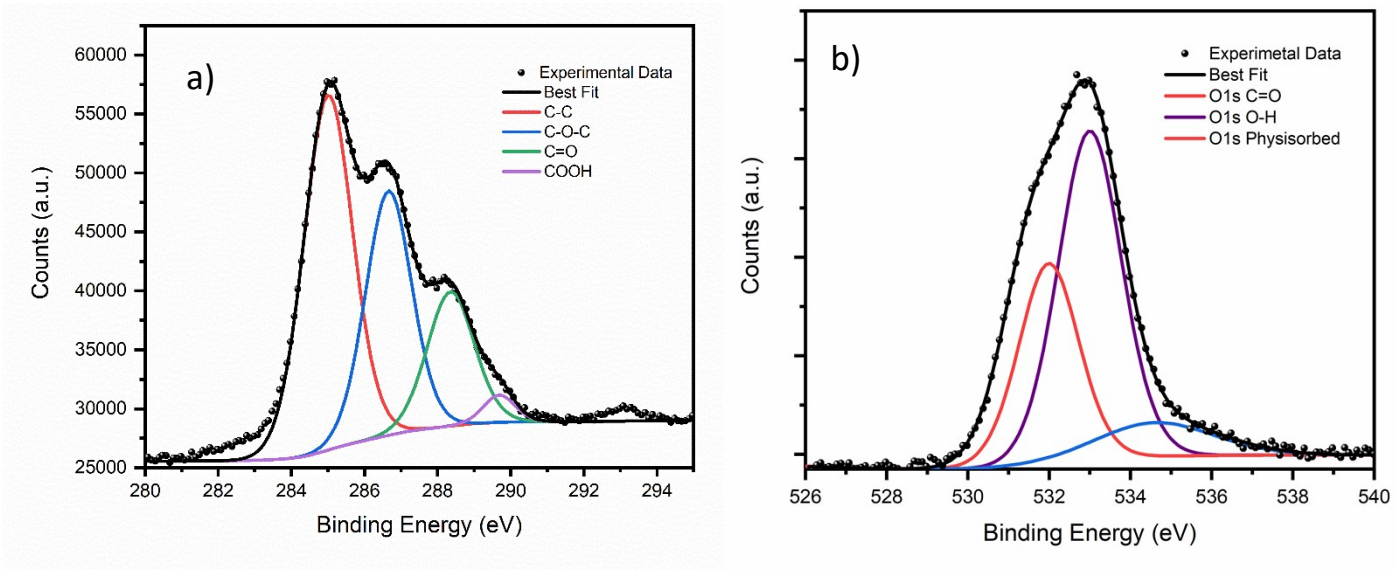

Figure S3. a) SR-XPS C1S core level spectra; b) SR-XPS O1S core level spectra.

Table S1: Results of the SR-XPS data analysis: relative intensity levels, BE (eV), FWHM (eV), and proposed signal assignments.

Signal	BE (eV)	Atomic ratio (exp.)	Assignment
Ag $3d_{5/2}$	368.02 369.15	90.4 9.6	Ag(0) Ag(δ+)
$Hg4f_{7/2}$	100.1 101.2	93.0 7.0	Hg(0) Hg(ii)
C 1s	285.2 286.8 288.3 289.8 291	3.5	C-C C-O-C C=O Contaminants COOH Contaminants COO^- Contaminants
O 1s	532 533 534.76	3.15 1.0	C=O C-O H_2O physisorbed

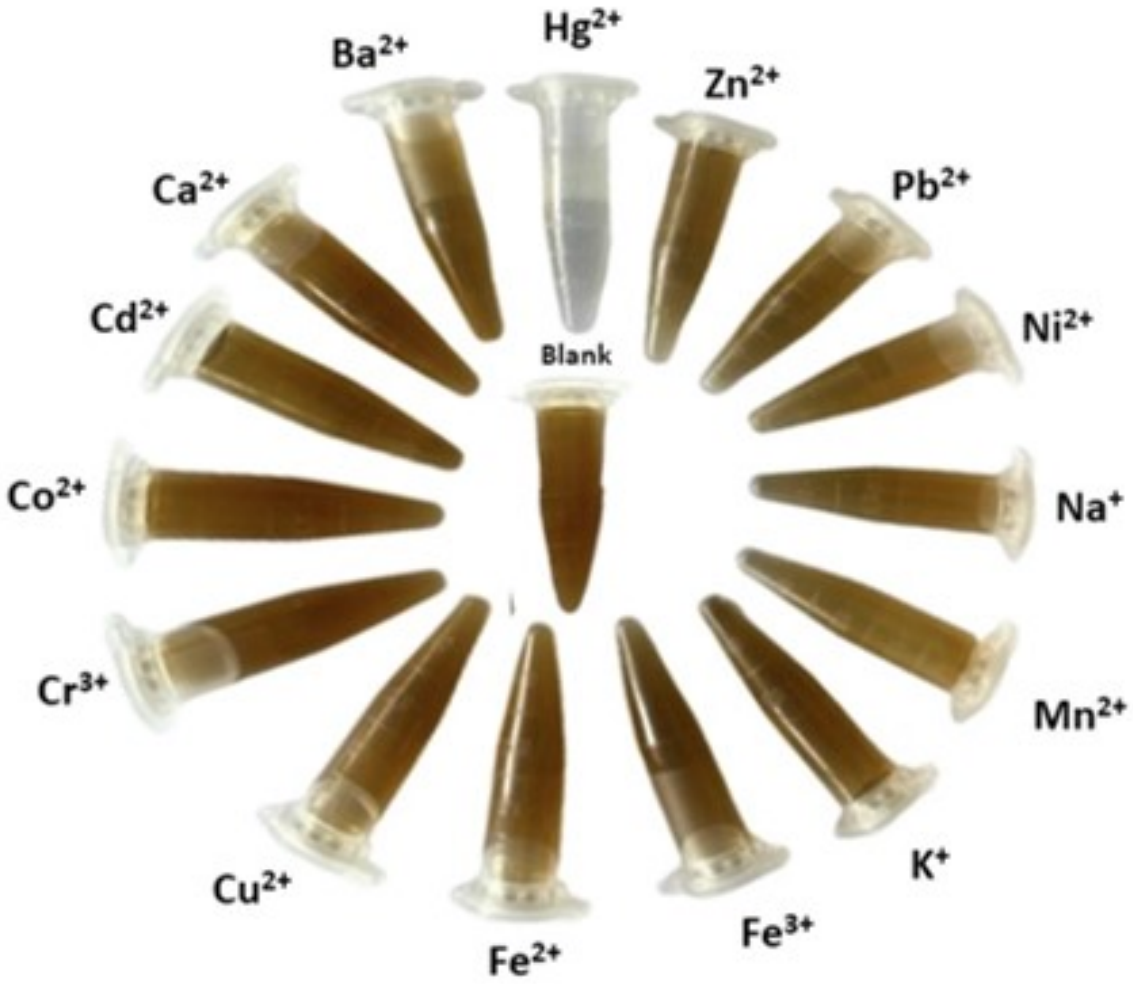

Figure S4: Colorimetric image of AgNPs with different metal ions

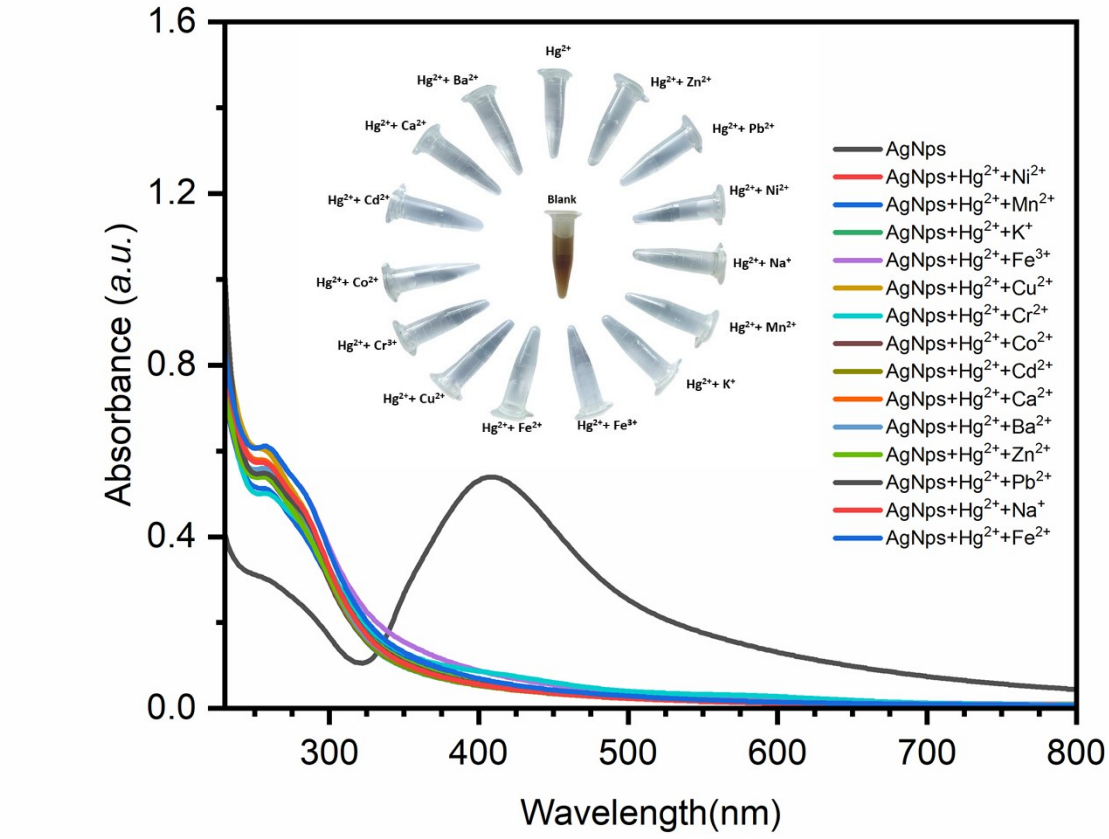

Figure S5: UV-vis absorption of AgNPs solutions incubated with Hg^{2+} and other 14 metal ions. Inside: Colorimetric images of AgNPs with equimolar Hg^{2+} and other metal ions.

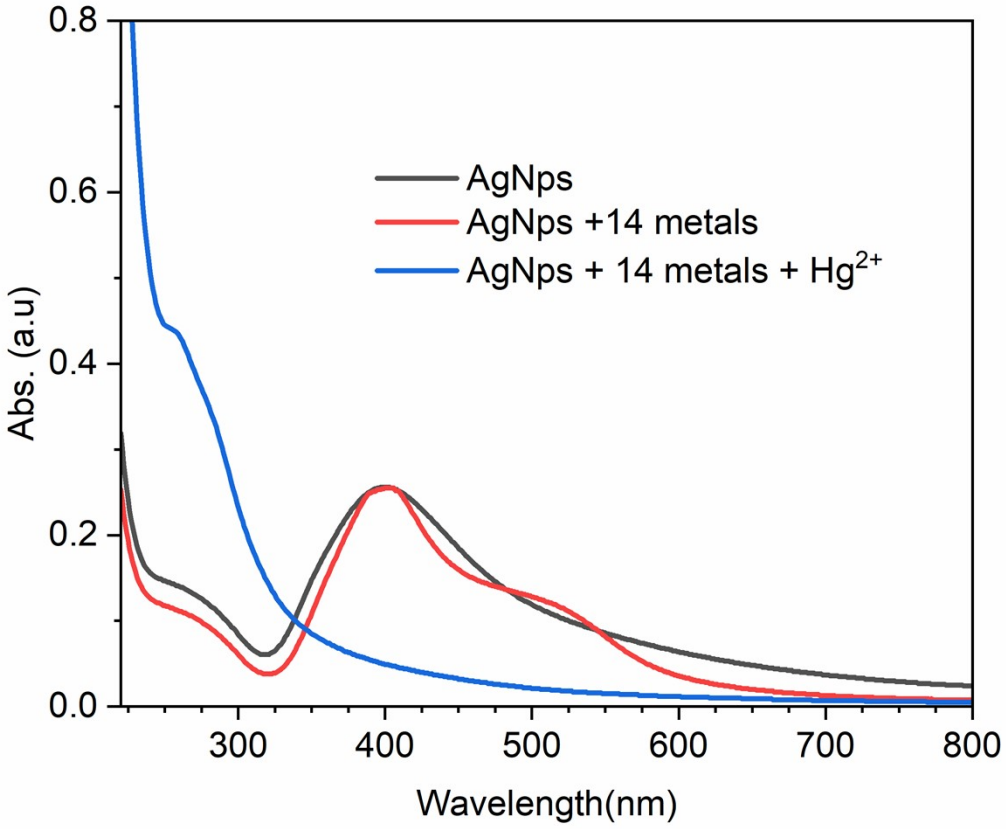

Figure S6. UV-vis spectra of AgNPs, AgNPs incubate with 14 other metal ions and AgNPs incubated with Hg^{2+} along 14 other metal ions.

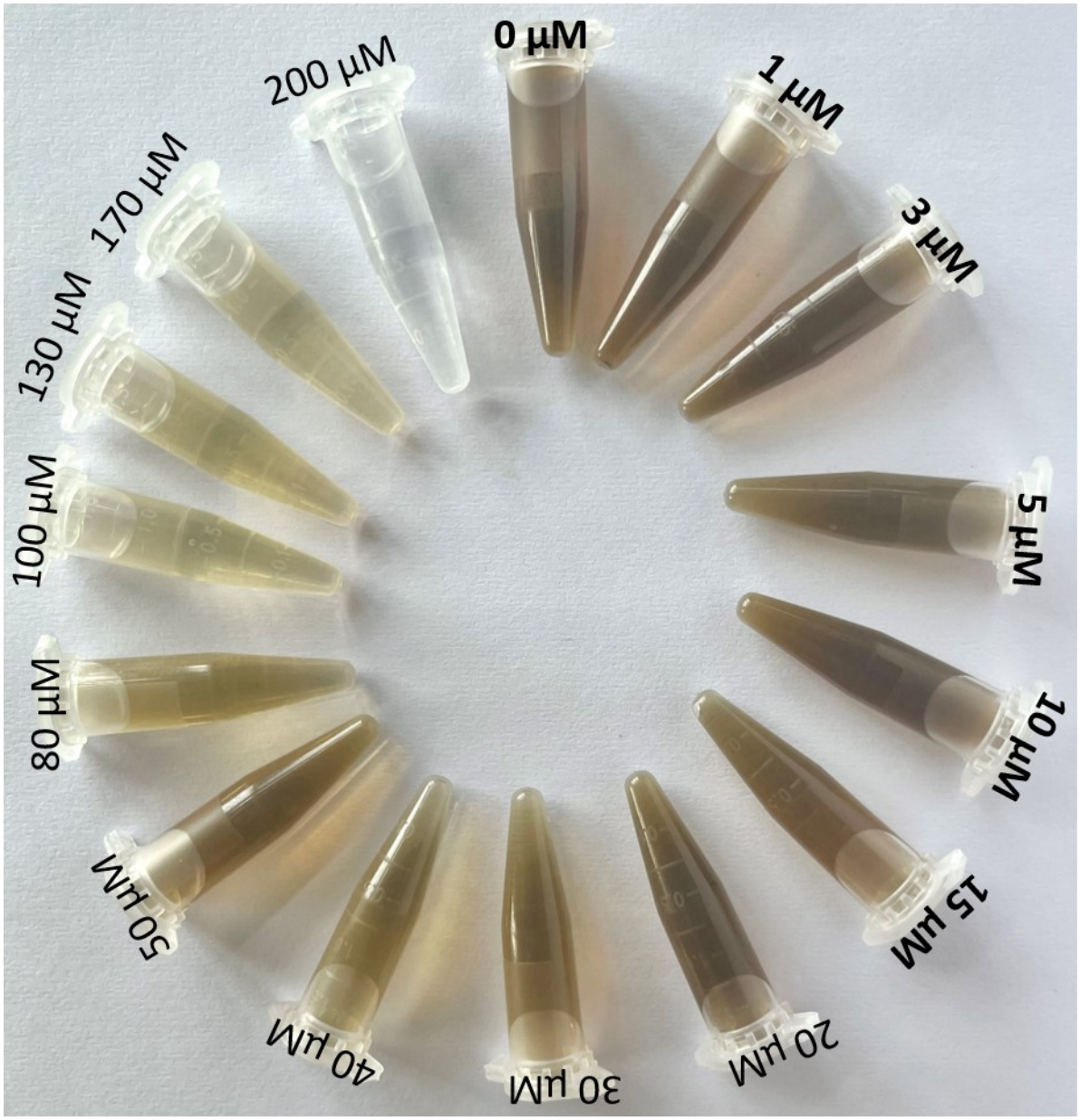

Figure S7: Colorimetric image of AgNPs with different concentration of Hg^{2+} ions.