BEILSTEIN JOURNAL OF NANOTECHNOLOGY

# Supporting Information

for

# Nanoarchitectonics with cetrimonium bromide on metal nanoparticles for linker-free detection of toxic metal ions and catalytic degradation of 4-nitrophenol

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## Additional figures

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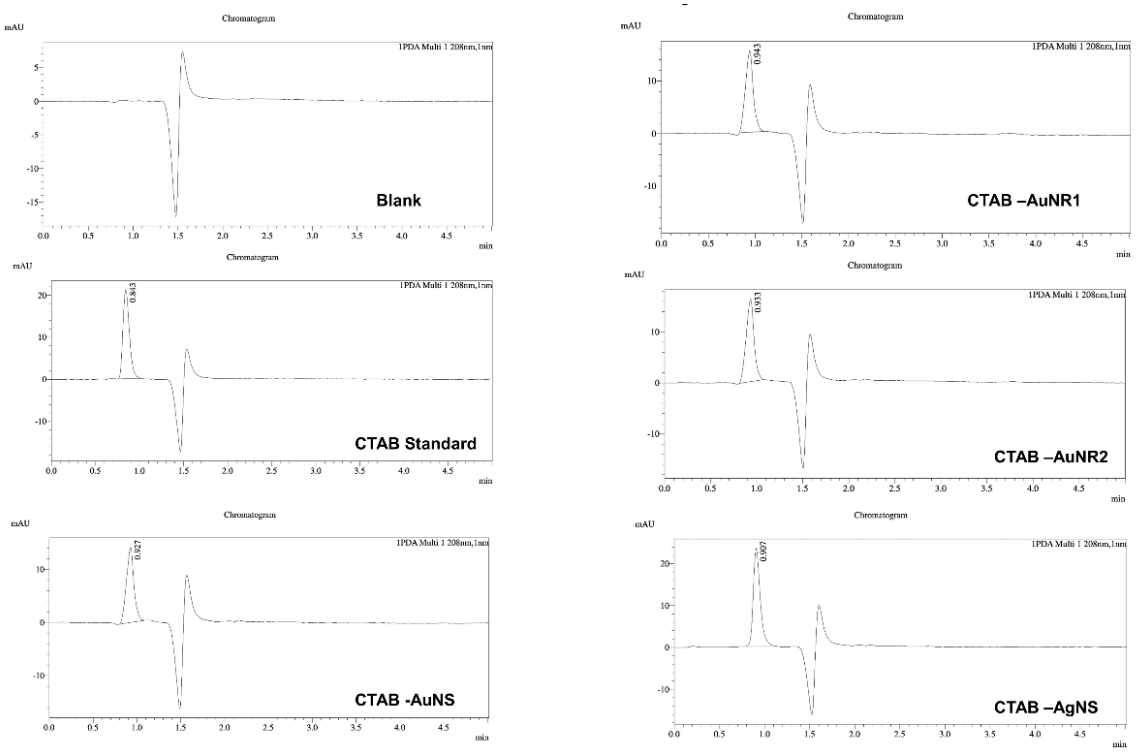


**Figure S1:** HPLC chromatogram of parent CTAB along with CTAB capped AuNS, AgNS, AuNR1 and AuNR2.

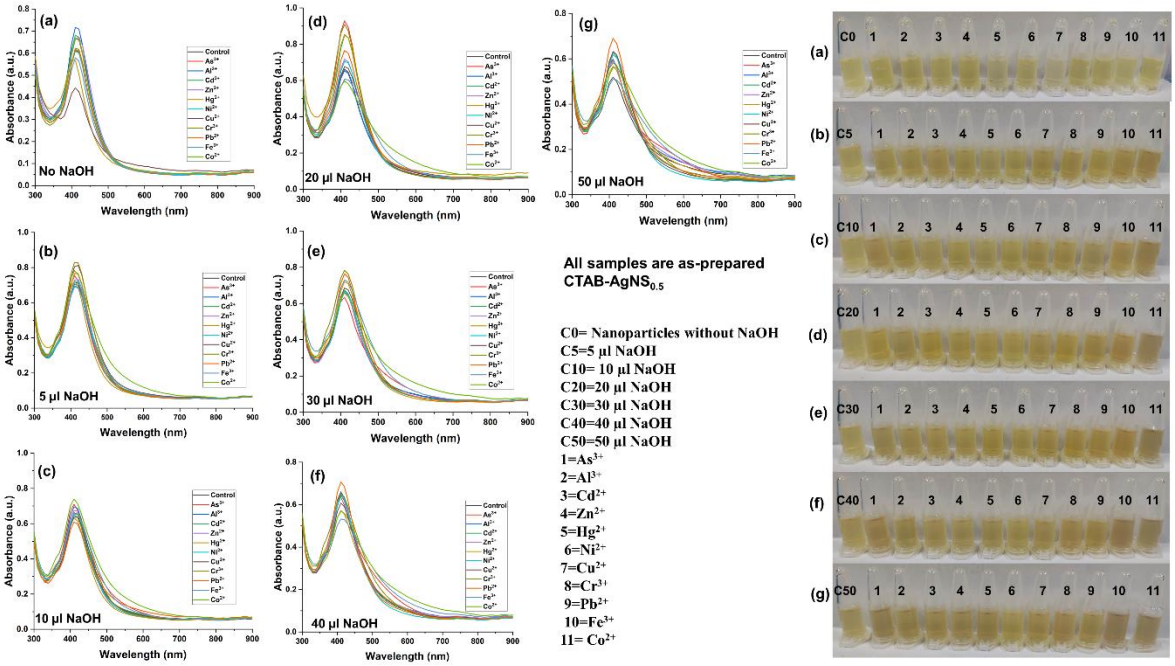


**Figure S2:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AgNS at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

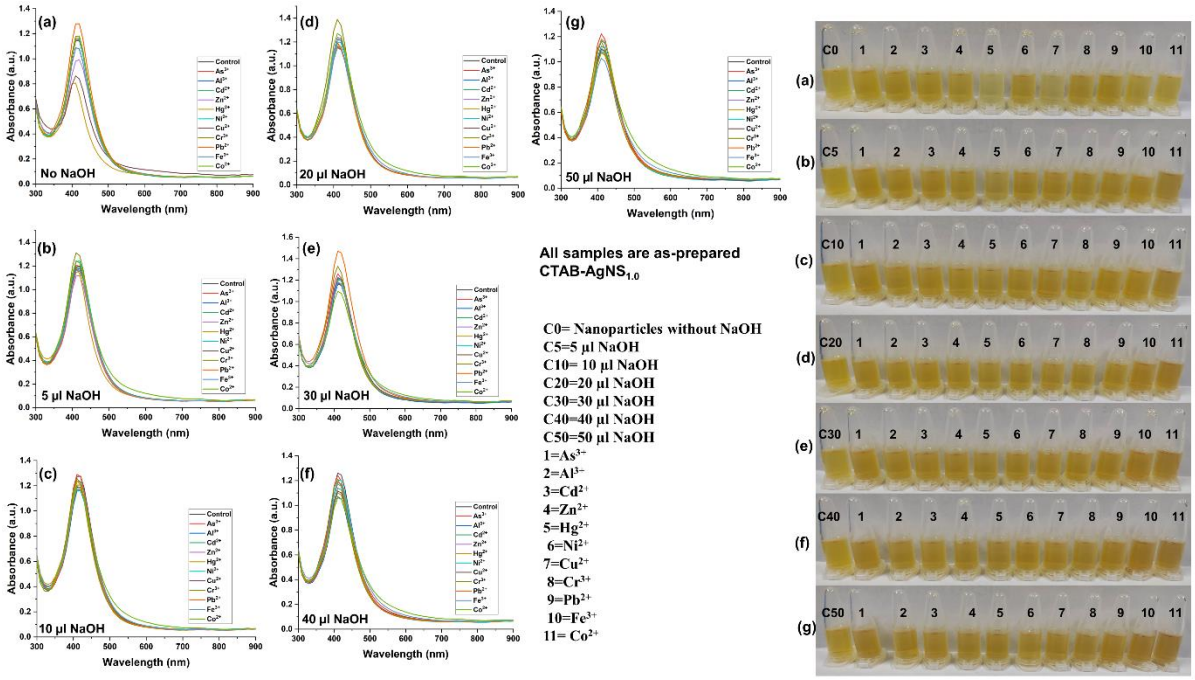


**Figure S3:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AgNS at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

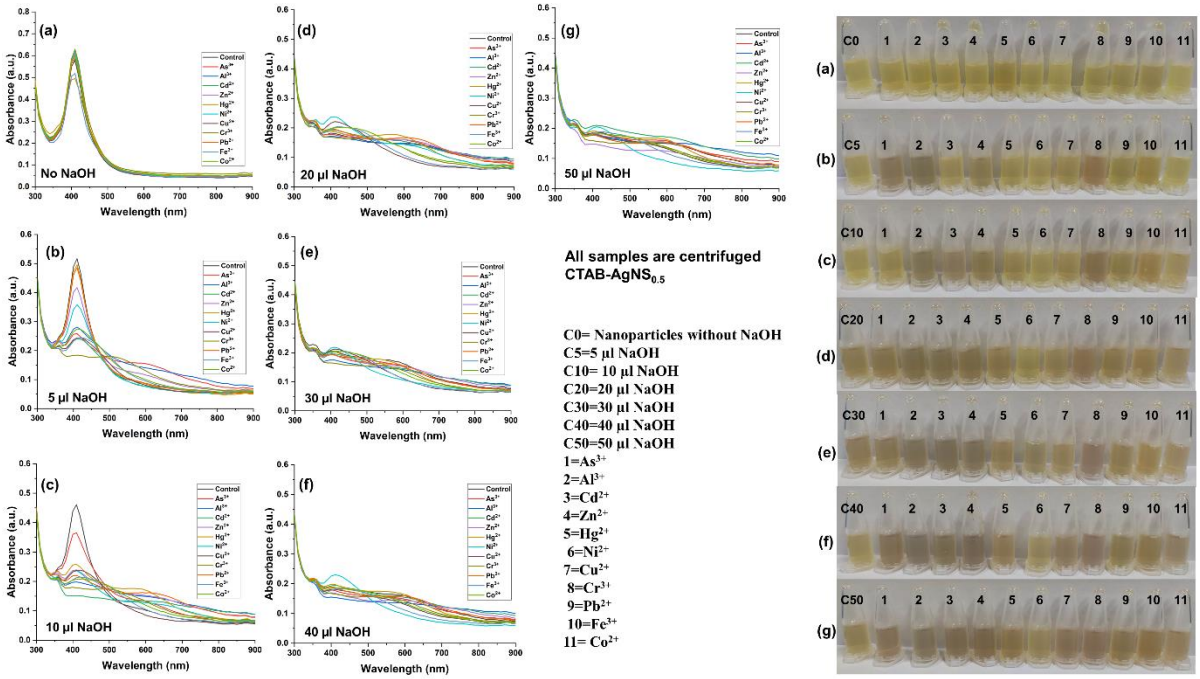


**Figure S4:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AgNS at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

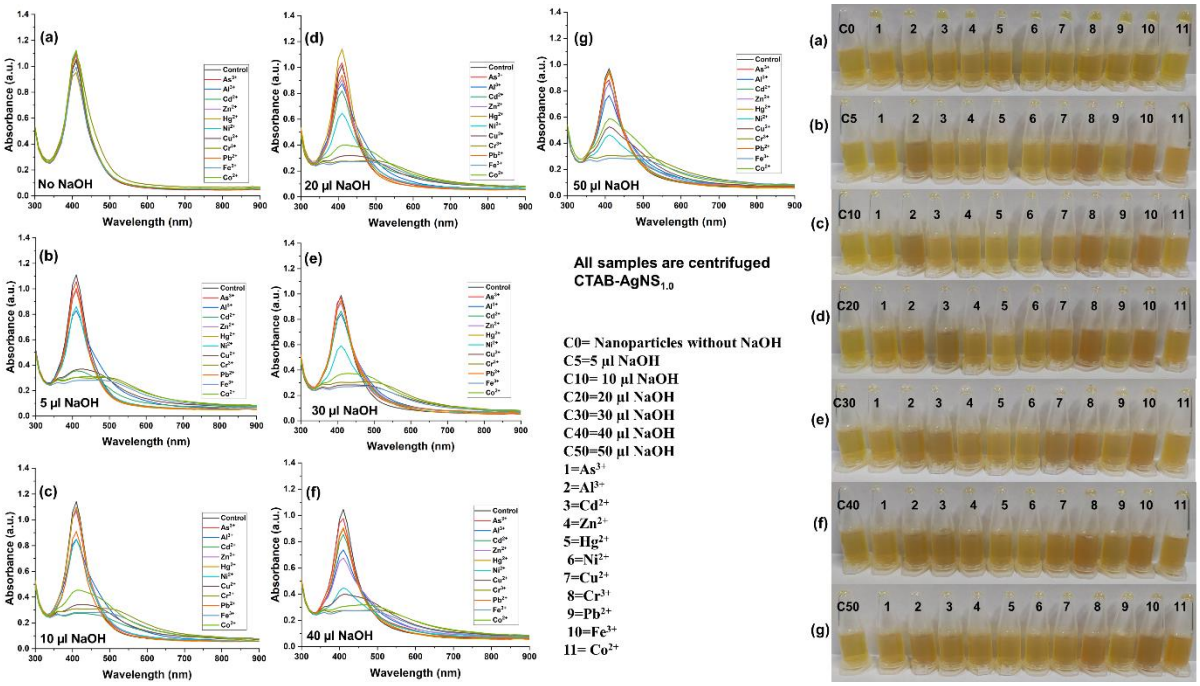


**Figure S5:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AgNS at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

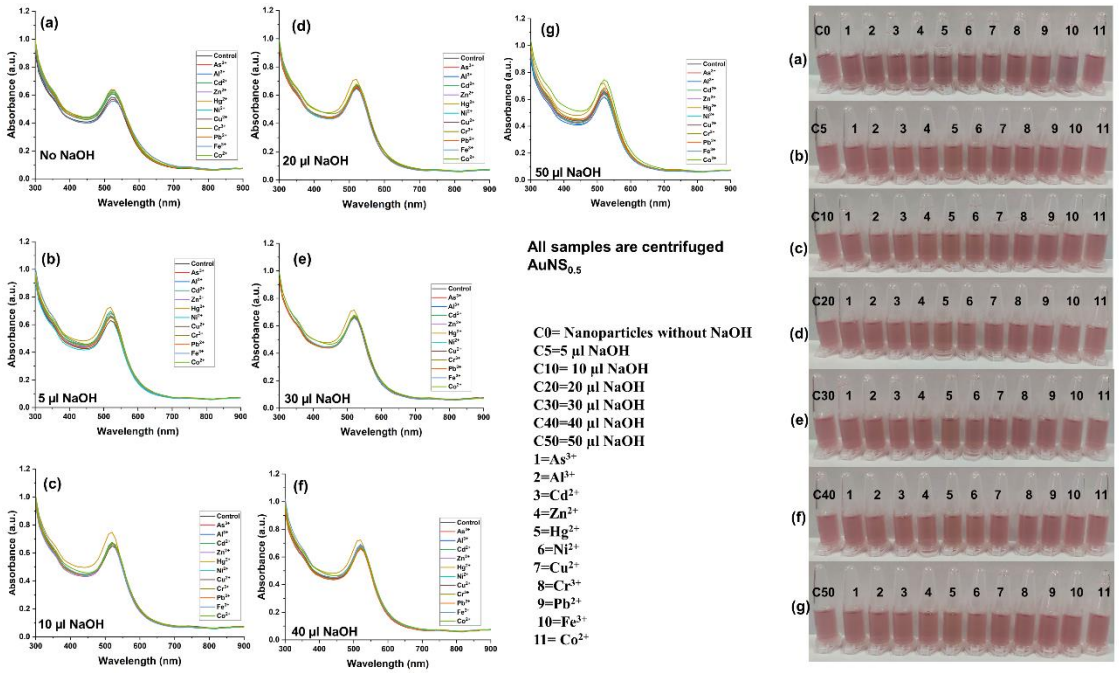


**Figure S6:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNS at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

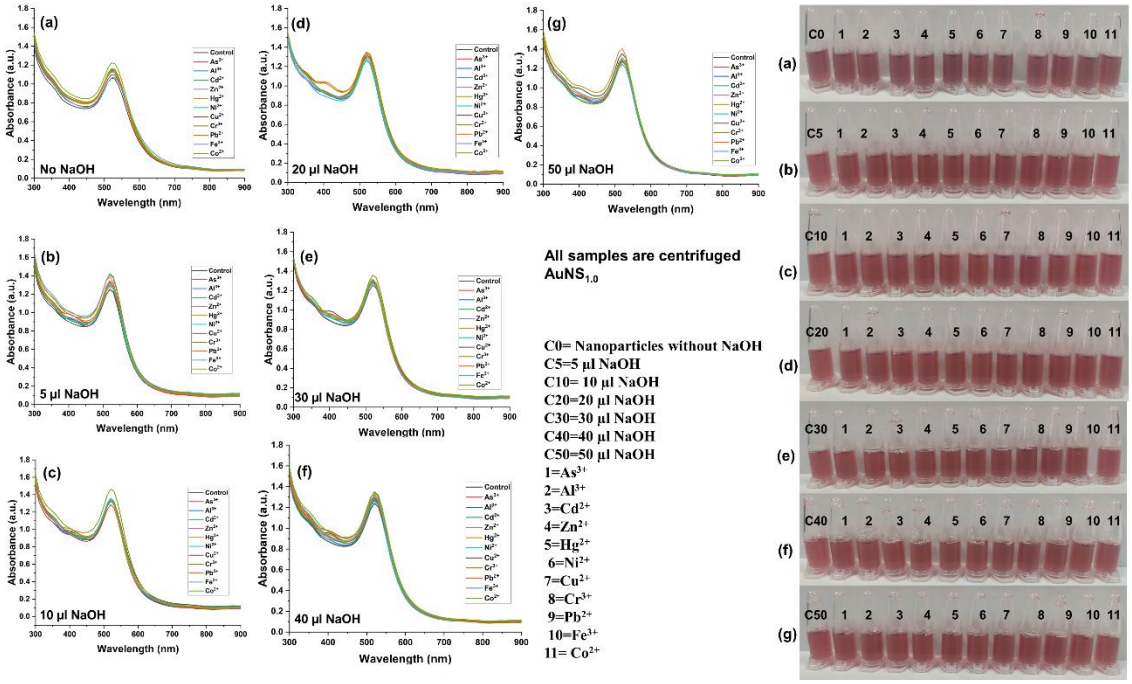


**Figure S7:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNS at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

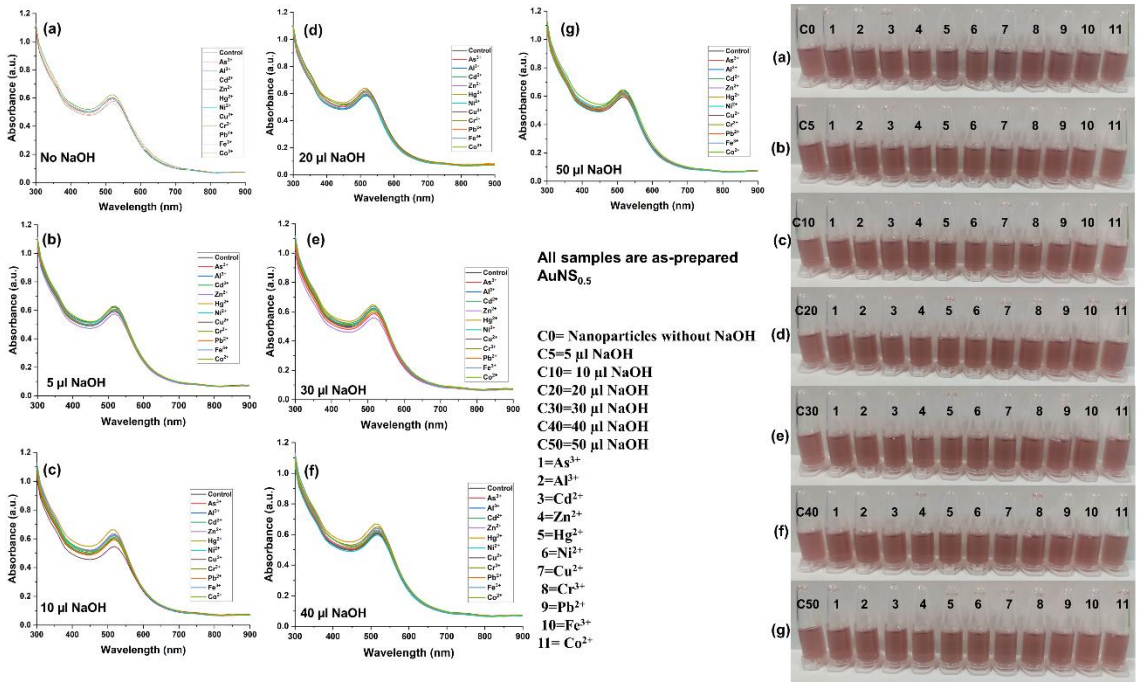


**Figure S8:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNS at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

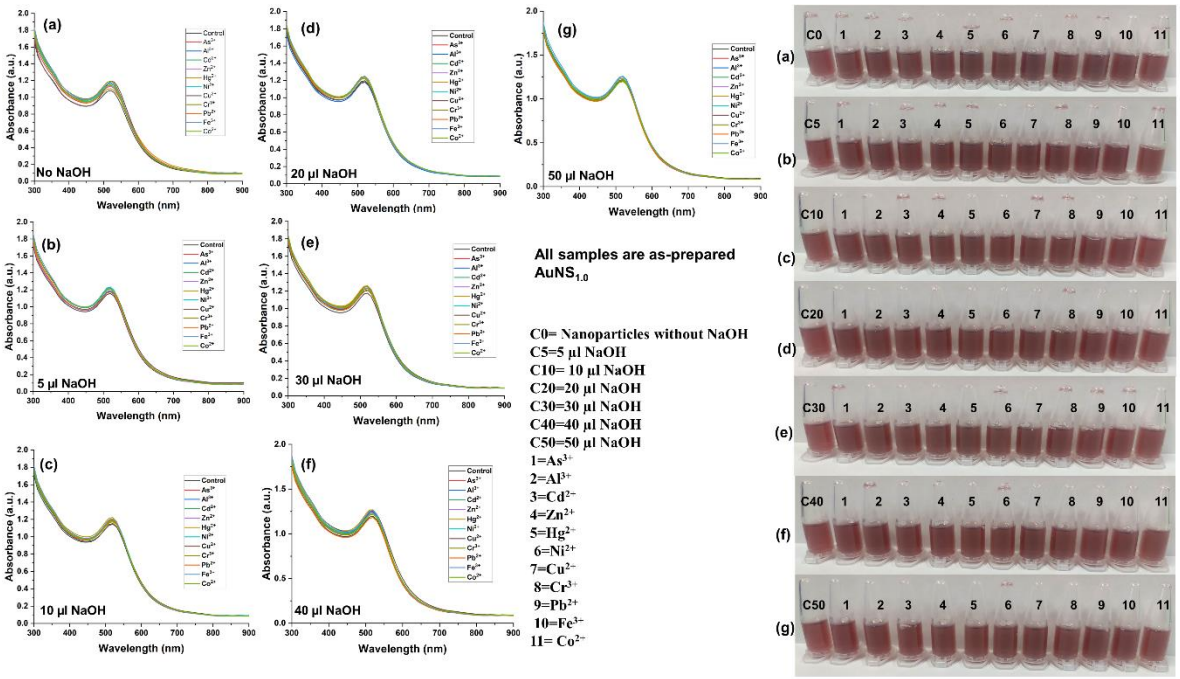


**Figure S9:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNS at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

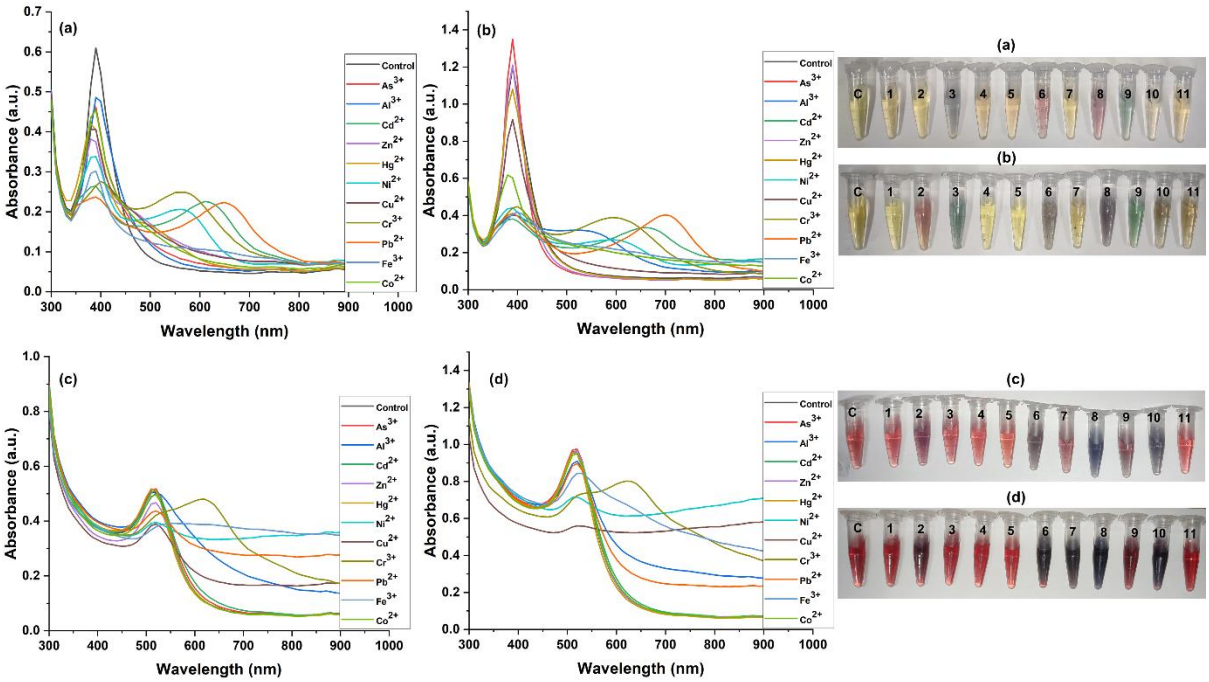


**Figure S10:** Spectrophotometric and colorimetric detection of heavy metal ions: a) and b) (Bare AgNS at 0.5 and 1 OD), c) and d) (Bare AuNS at 0.5 and 1 OD). The C represents control sample without metal ions in colorimetric images.

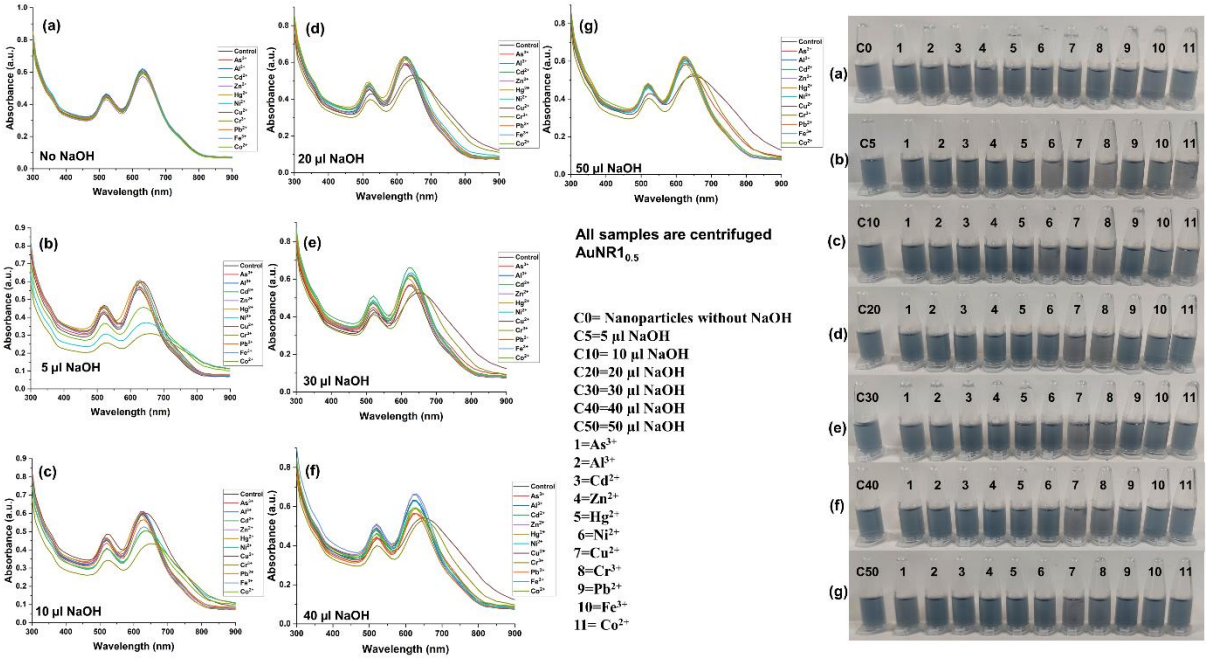


**Figure S11:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNR1 at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

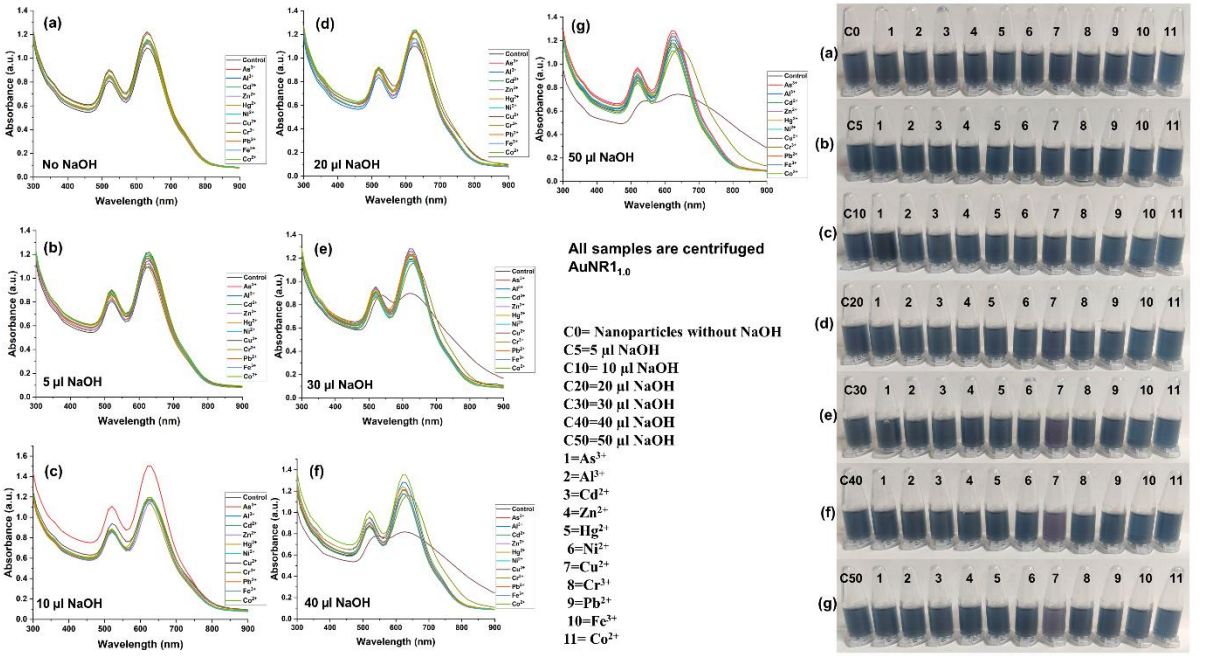


**Figure S12:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNR1 at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

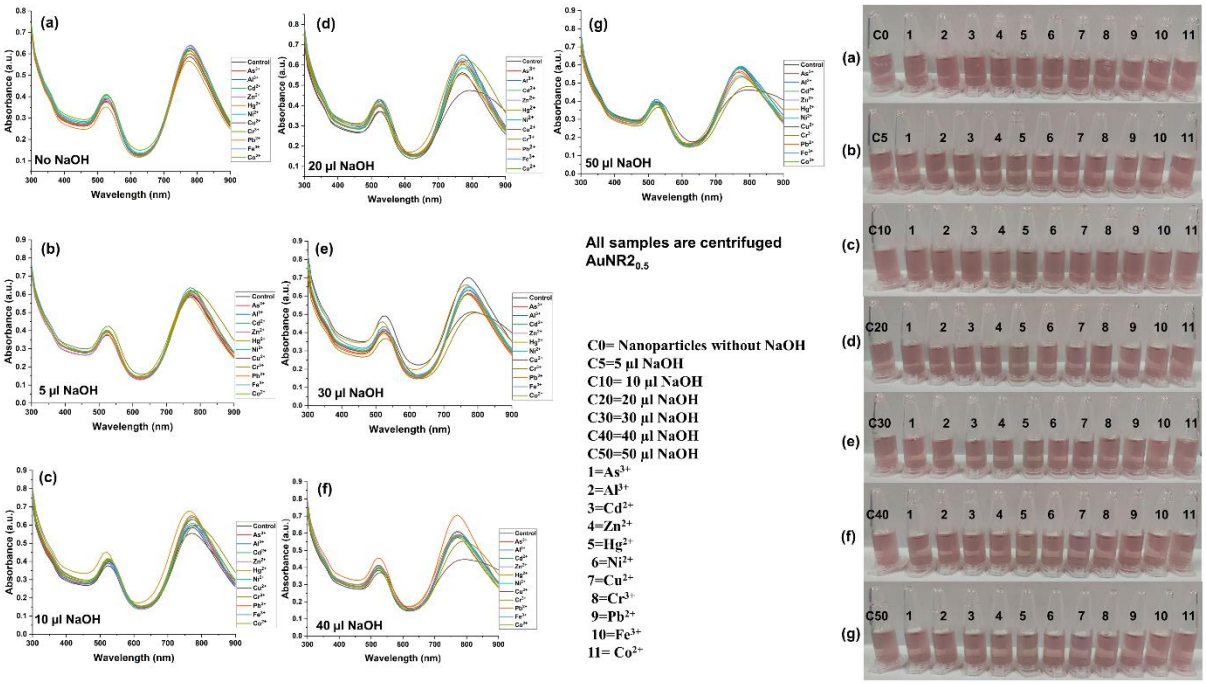


**Figure S13:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNR2 at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

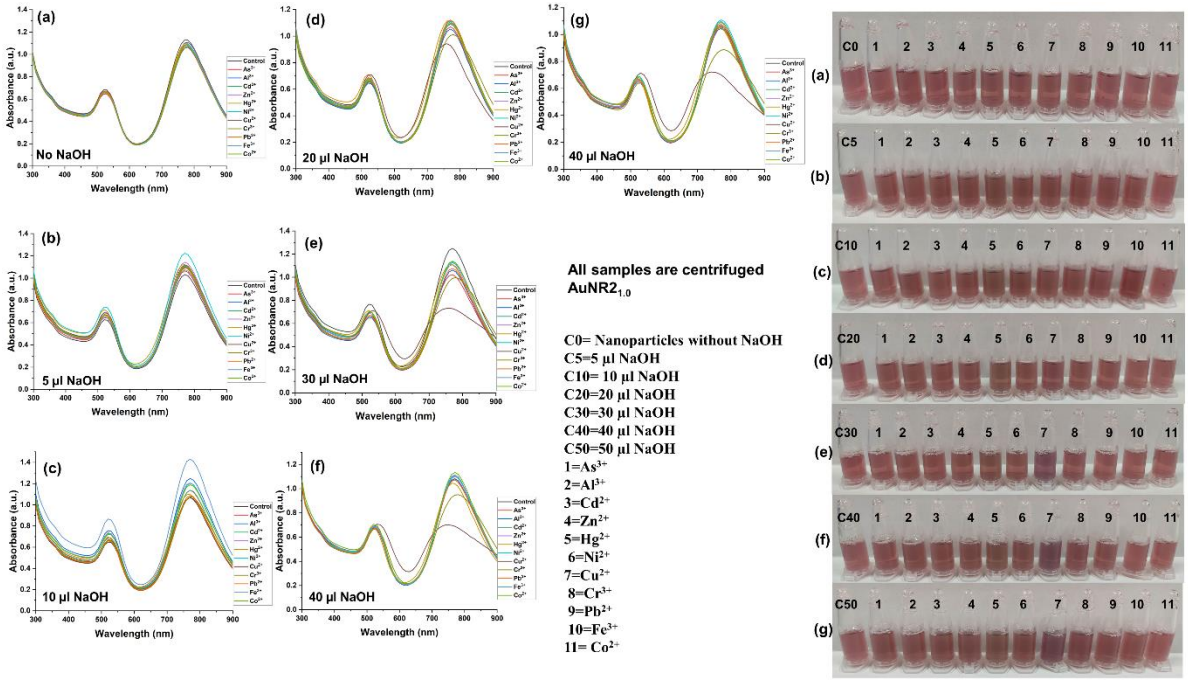


**Figure S14:** Spectrophotometric and colorimetric detection of heavy metal ions using centrifuged CTAB-AuNR2 at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

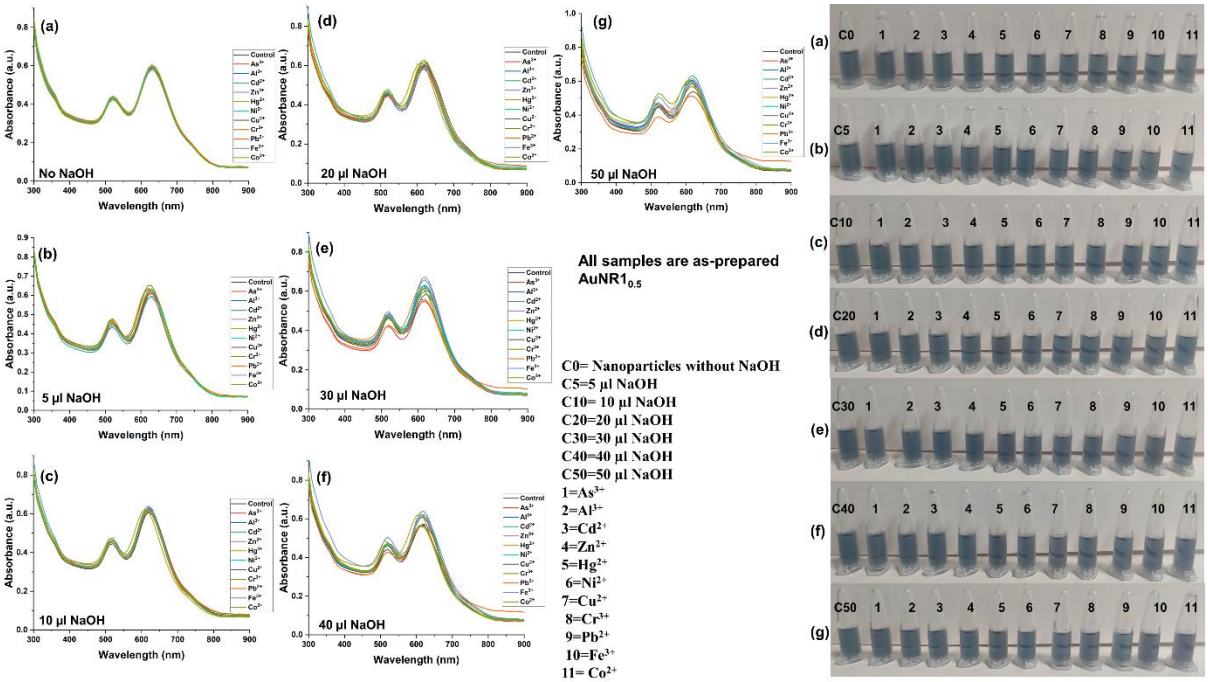


**Figure S15:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNR1 at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

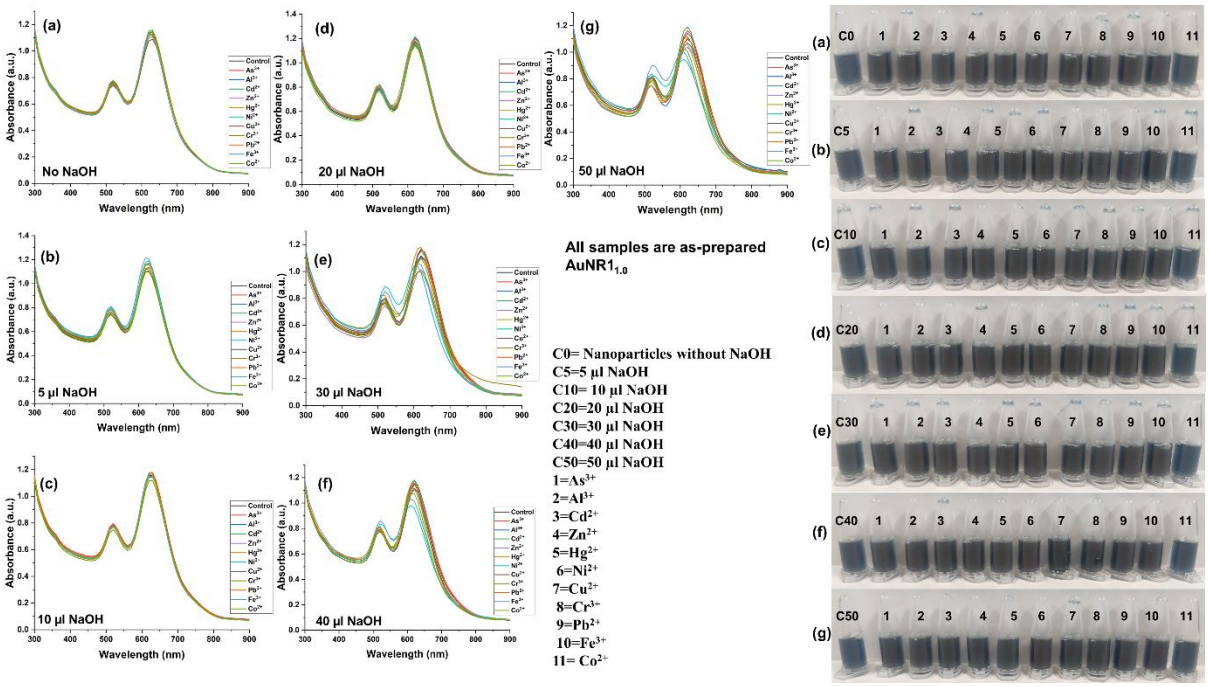


**Figure S16:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNR1 at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

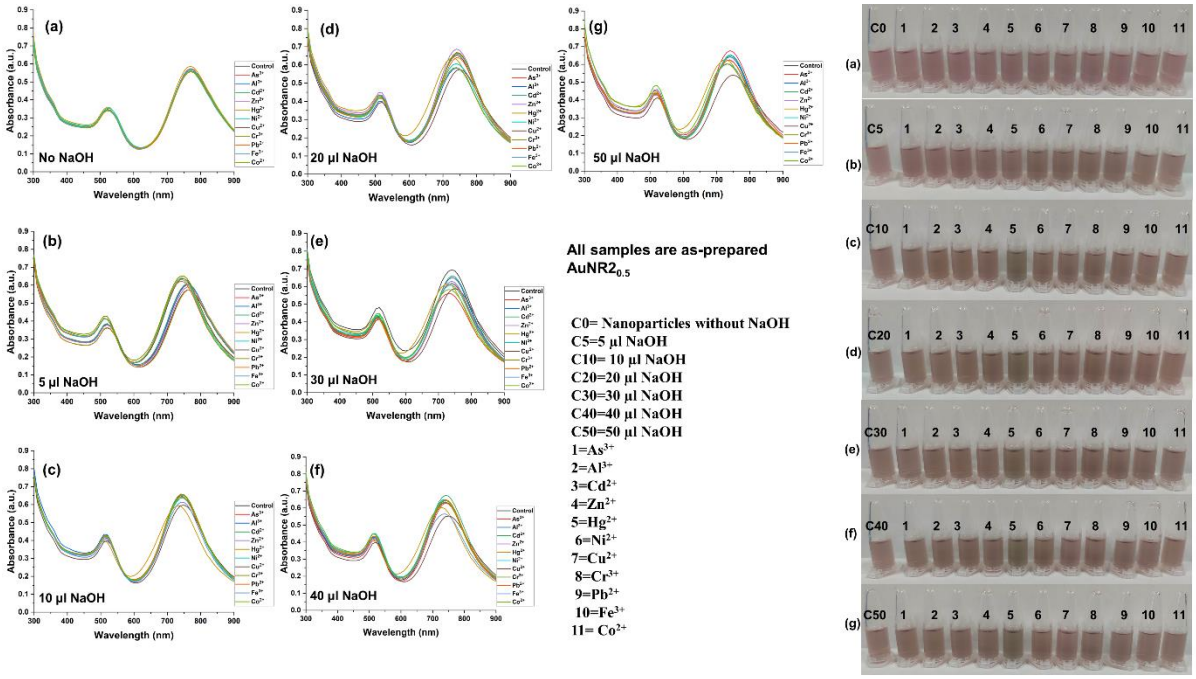


**Figure S17:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNR2 at 0.5 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

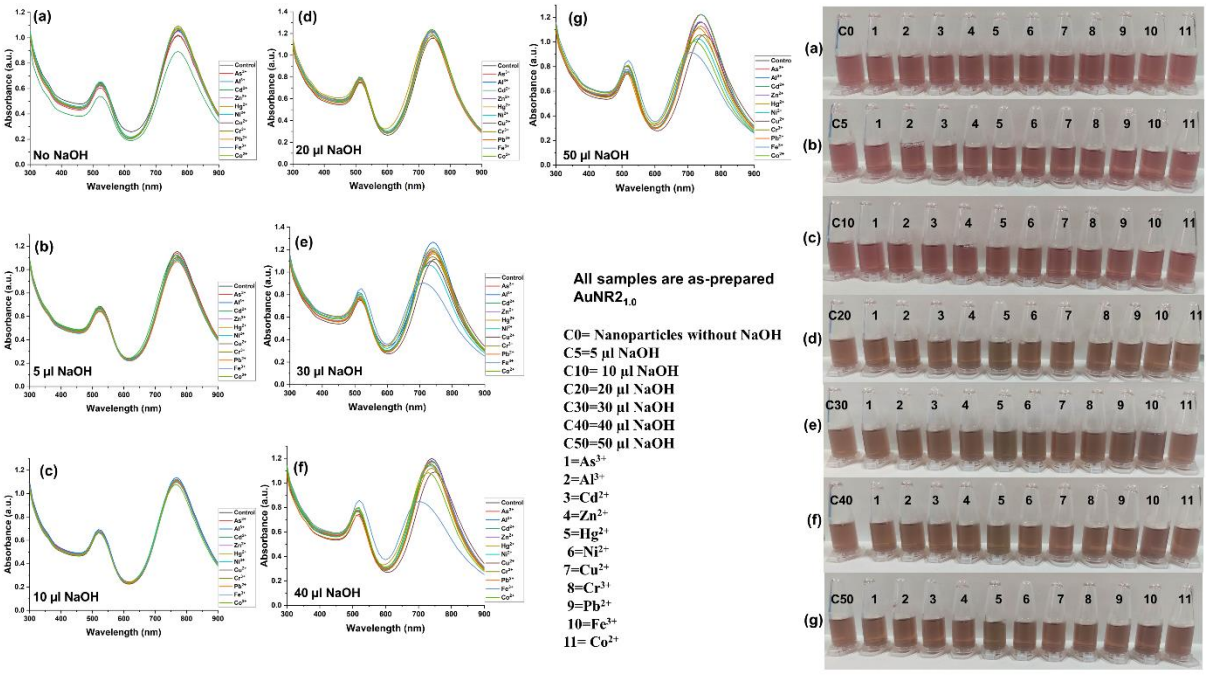


**Figure S18:** Spectrophotometric and colorimetric detection of heavy metal ions using as-prepared CTAB-AuNR2 at 1 OD in the absence (a) and presence (b-g) of NaOH (5-50 µL).

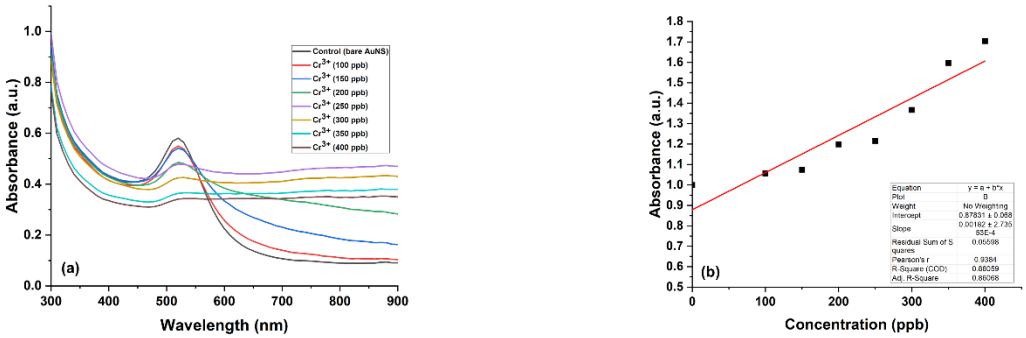


**Figure S19:** Optical absorbance of (a) bare AuNS with different concentrations of chromium ion and (b) Linear plot for quantification of LOD and LOQ of chromium.

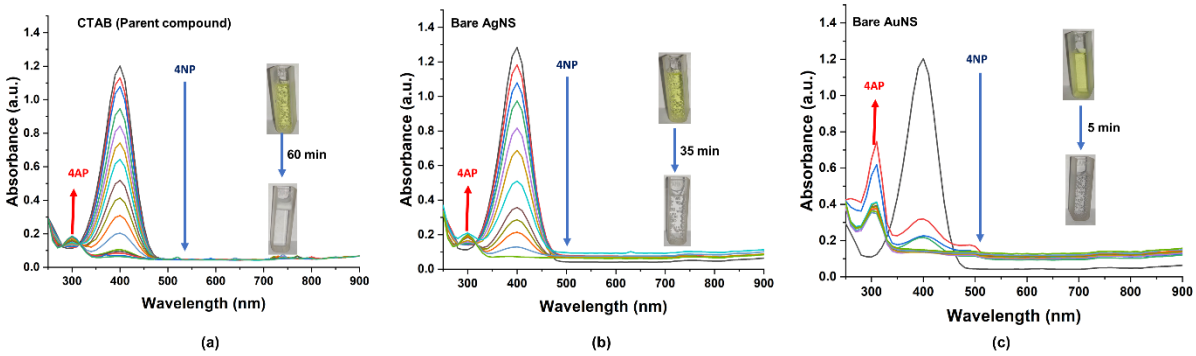


**Figure S20:** Catalytic degradation of 4-NP using a) CTAB, b) Bare AgNS and c) Bare AuNS.