## **Supporting Information**

## Drastic Nickel Ion Removal From Aqueous Solution By Curcumin-Capped Ag Nanoparticles.

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AgNO<sub>3</sub> and curcumin concentrations were optimized monitoring the formation of silver plasmonic peak (at 423 nm) and the vanillin absorption peak (located at 274 nm). A curcumin excess shows a quick formation of the most abundant degradation product during the synthesis procedure, vanillin, whereas a defect of AgNO<sub>3</sub> induces a negligible increase of the intensity of the plasmonic peak.



**Fig. S1** Fluorescence spectra of guaiacol, ferulic acid and vanilline recorded with an excitation wavelength of 430 nm. Fluorescence intensities is more than 5 times lower than curcumin fluorescence emission, and the spectral profile are deeply different.



**Fig. S2** Plasmonic peak of silver nanoparticles using ferulic acid as reducing agent obtained by the same procedure adopted in the presence of curcumin. A comparison of the spectra obtained using curcuimin as the reducing species is proposed. The maximum of absorption, located at 434 nm, is close to 430 nm obtained in presence of curcumin but the lower yield of the synthesys with ferulic acid is evident comparing the intensity of absorption bands after 120 min.



**Fig. S3** a) schematic representation of the capping mechanism of Ag nanoaggregates with curcumin molecule. For sake of semplicity, silver aggregate was represented by a sphere capped by just two curcumin molecules. According to the spectroscopic and morphologic evidences reported in figures 1 and 2, the silver nanoaggregates probably interact with more than two molecules of curcumin. b) Stronger affinity of curcumin towards nickel than to silver induces the formation of a low soluble adduct. Infrared spectra suggest that the curcumin nickel chelation mechanism reported in the litterature at alkaline pH is the same that rule the formation of the Ni<sup>2+</sup>-curcumin precipitate.