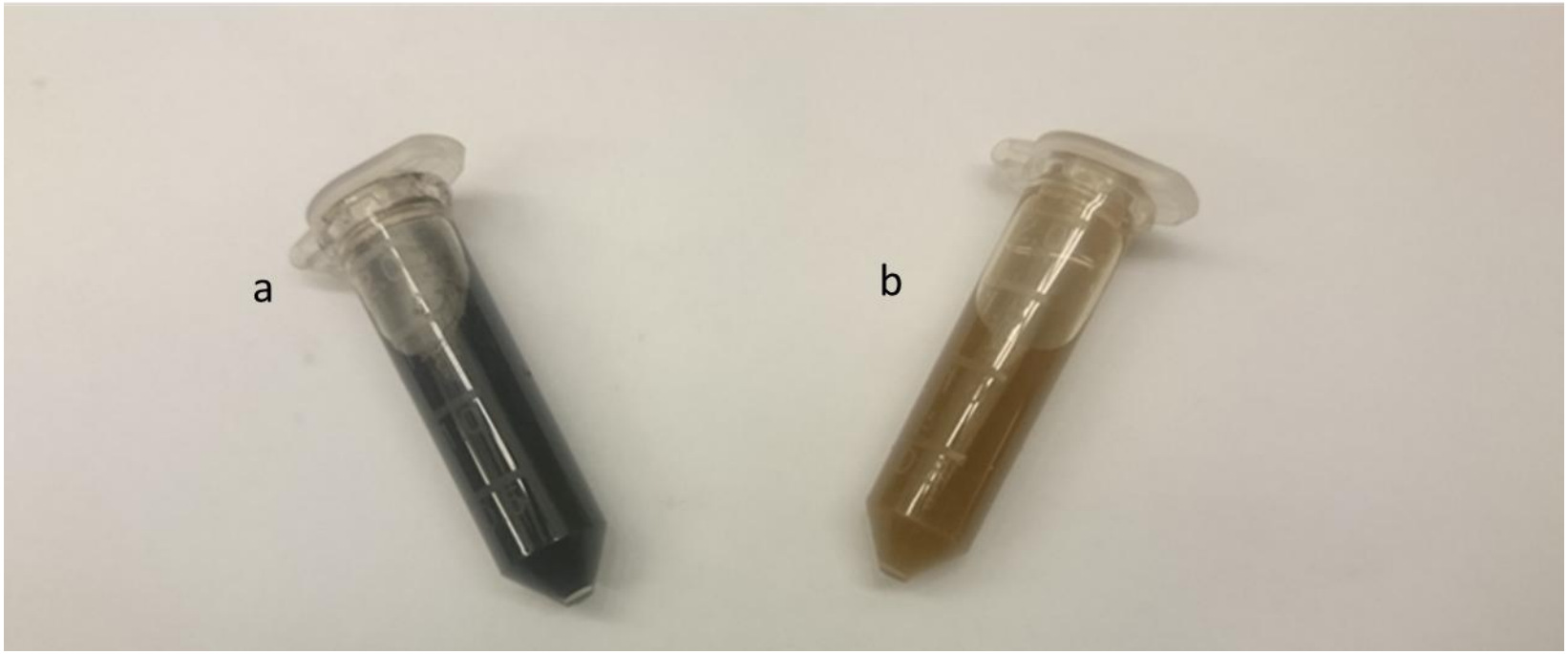
Supplementary Information



Supplementary information 1. Change in color of MNPs as induced by changing their status from magnetite (a) to meghemite (b).

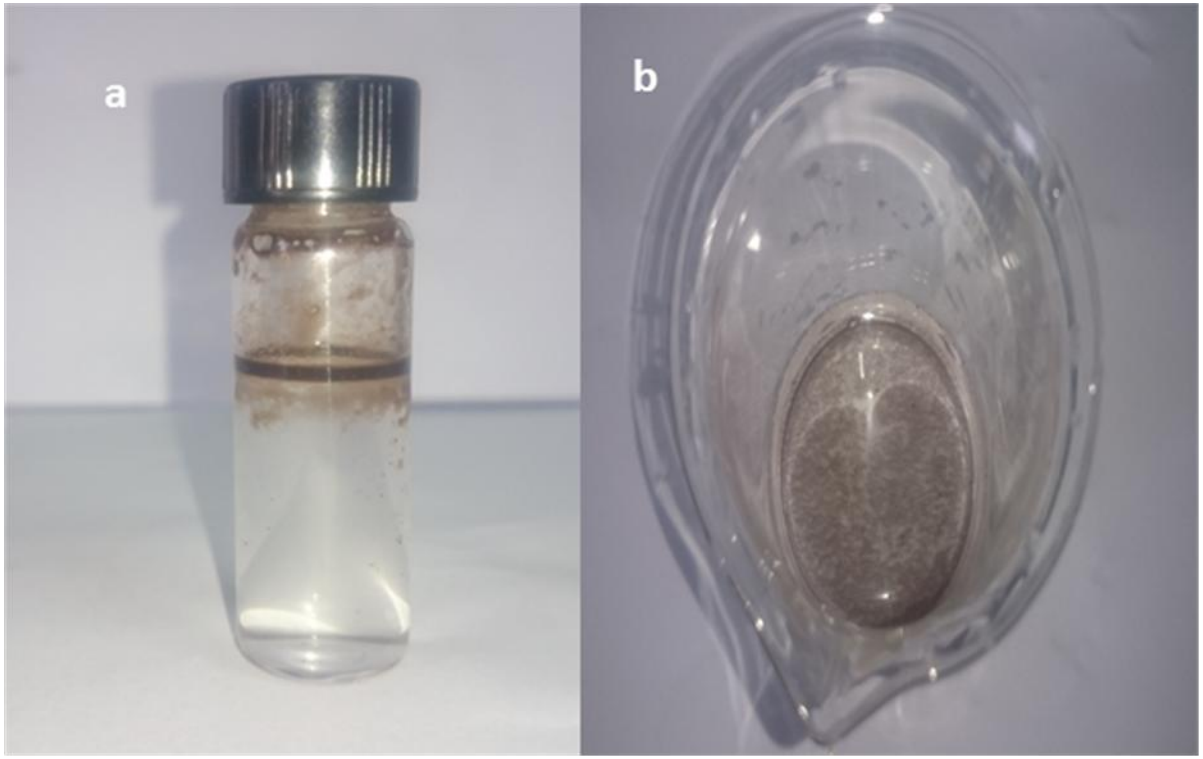
Supplementary information 2. XRD data of the prepared MNPs

Position (2θ)	Å(2θ)
30.29	2.957
35.72	2.518
43.38	2.091
57.45	1.605
63.07	1.474

*D value: inter-atomic spacing in Angstroms (Å)

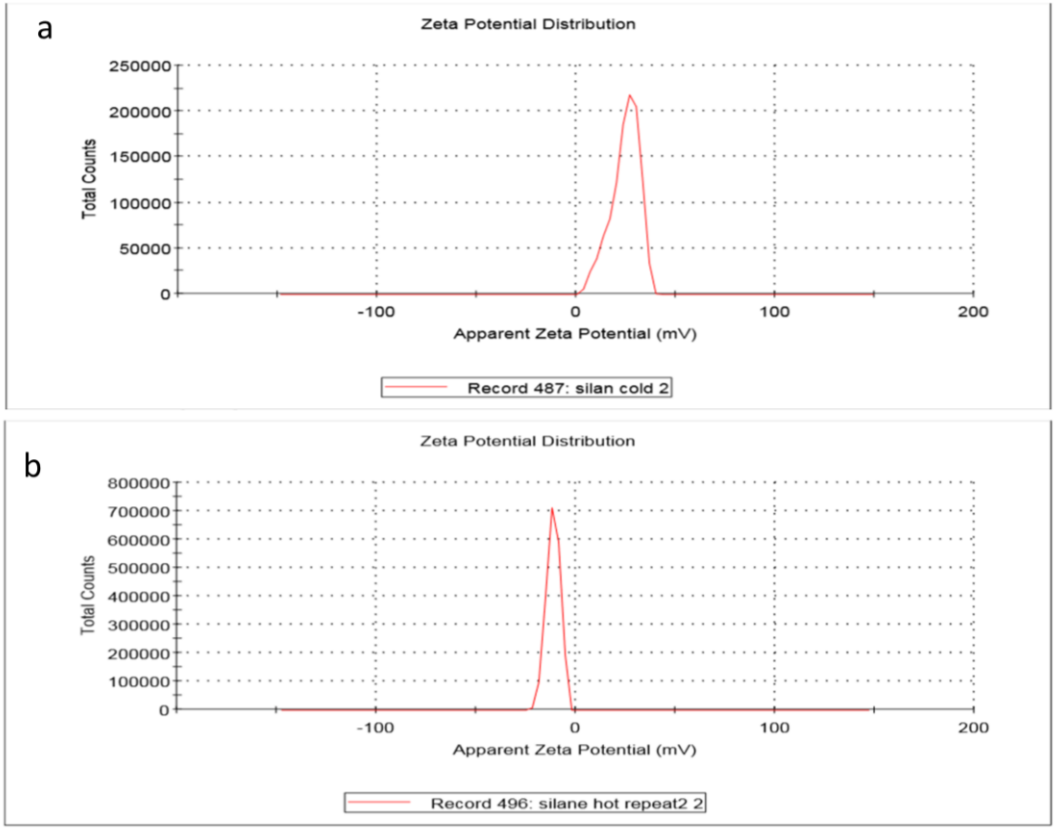
*XRD was recorded at a Cu Kα anode (λ = 0.1542 nm) operating at 40 kV and 30 mA. The pattern was collected at 25 °C in range 5 – 70° with a step size of 0.03° and step time of 1 s.

Supplementary information 3.



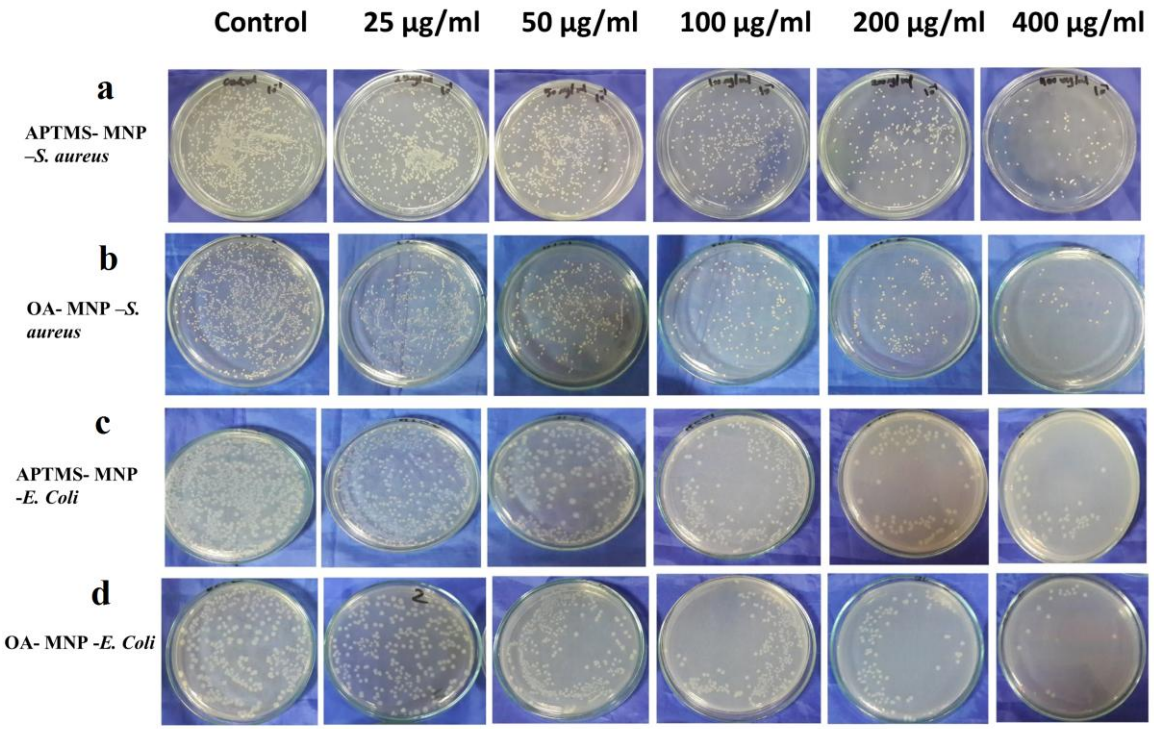
Supplementary information 3. (a) OA-MNP (after washing with water and before wash with ethanol) showing OA-NP not dispersed in water instead floating on water surface. (b) After successive washing with ethanol to remove excess OA from surface of MNPs; OA-MNP are still floating and unable to disperse.

Supplementary information 4.



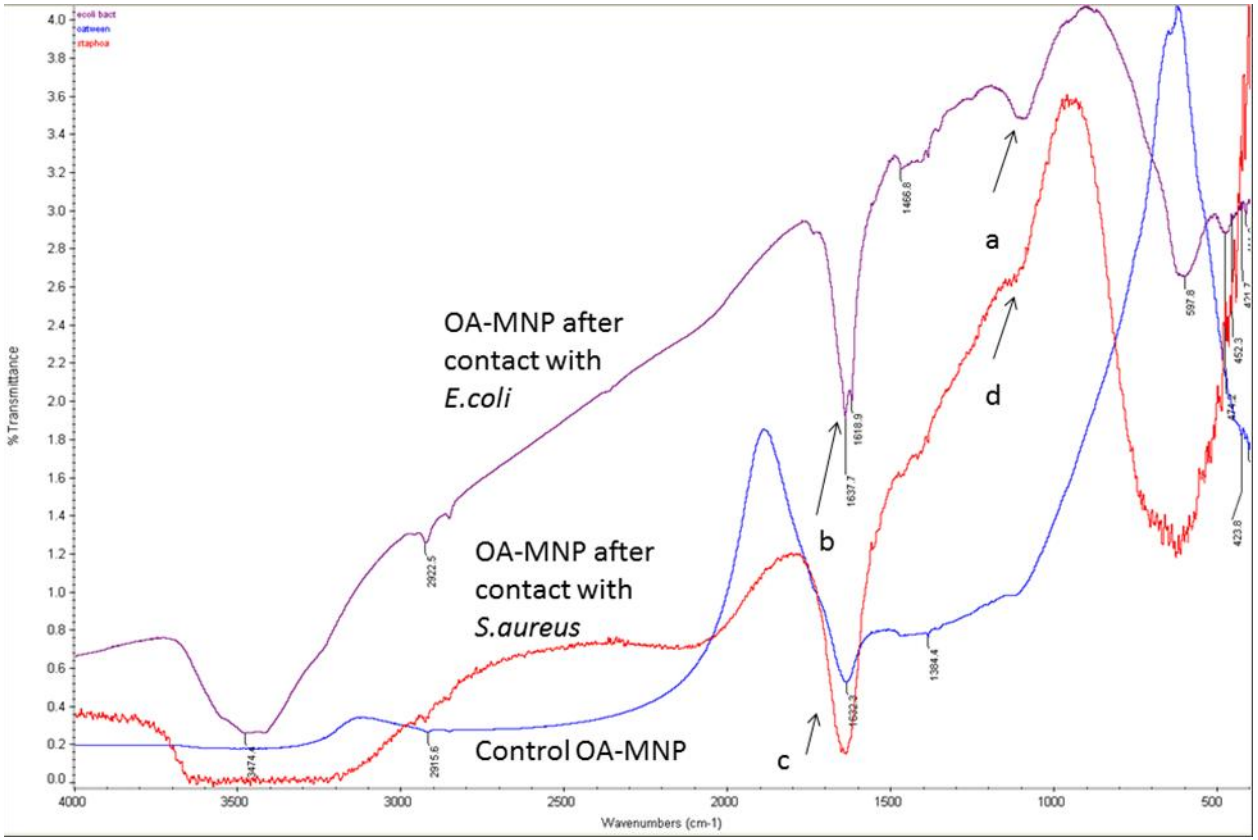
Supplementary information 4. Evaluation of the APTMS- MNP method was performed by comparing the Zeta potential shift imparted on the MNP. (a) Charge on surface of MNPs by the cold synthesis method (+25 mV). (b) Surface charge of particles prepared by the hot synthesis method (-11 mV). The cold synthesis method was more efficient to coat the MNPs with a surface positive charge.

Supplementary information 5



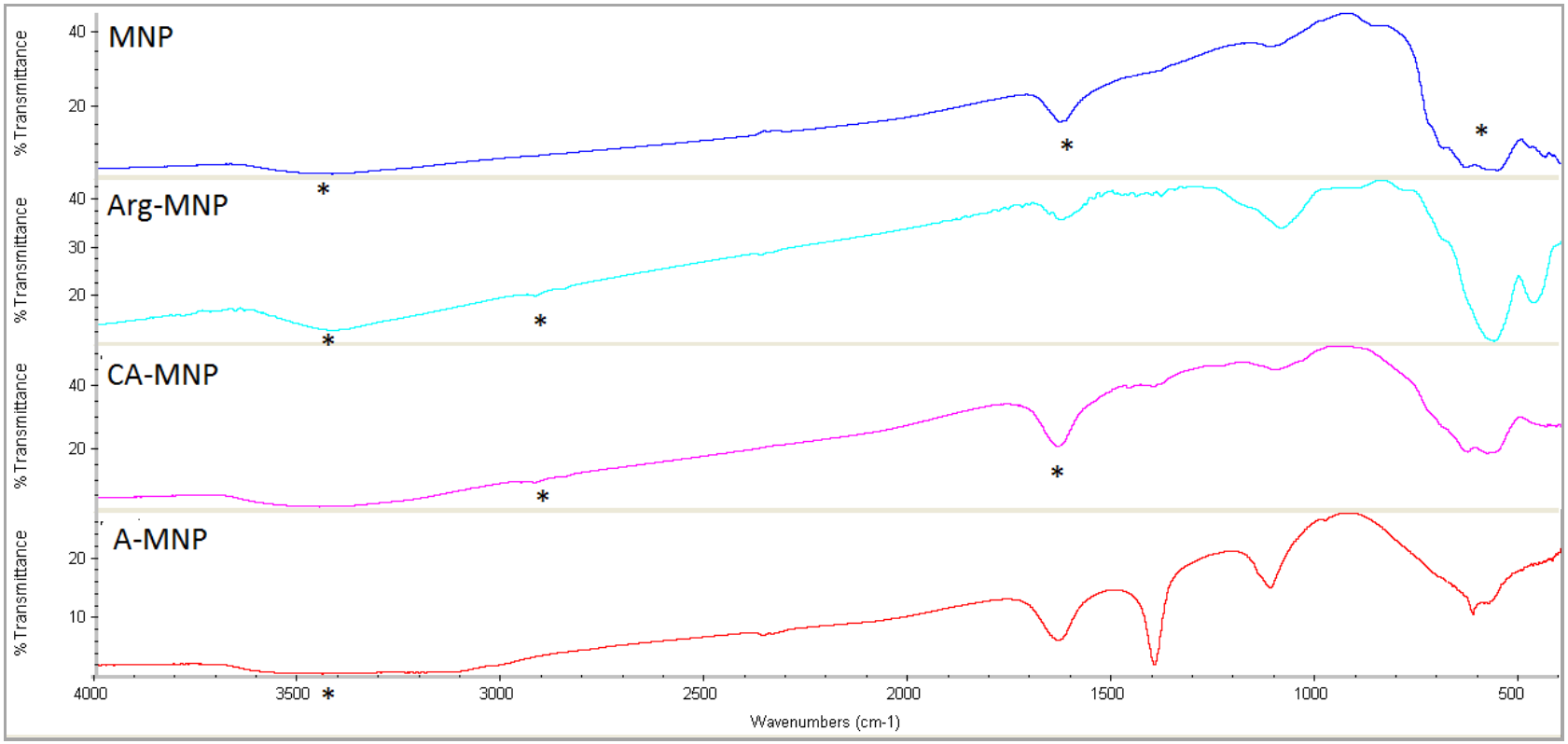
Supplementarry information 5. Growth Inhibitory effect of MNPs on test bacteria 24 h post incubation with variable concentrations of MNPs. Subculture *S.aureus* (ATCC-6538) and *E.coli* (ATCC-8739) were incubated with varying concentrations of APTMS-MNP and OA-MNP for 24 h at 37°C on a shaker (200 rpm) for 24 h. At the end of the incubation period, samples were obtained from each flask and 10 fold serially diluted in sterile saline. One hundred µL of each dilution as well as control were spread on the surface of 3 nutrient agar plates, incubated at 37°C for 24 h and the average numbers of colony forming units (CFU/mL) were counted. (a) and (c) show the effect of APTMS-MNP on *S. aureus* and *E. coli*. (b) and (d) show the effect of OA-MNP on *S. aureus* and *E. coli.*

Supplementary information 6.



Supplementary information 6. FTIR spectrum of control OA-MNPs before and after contact with *S. aureus* and *E. coli*. For *E. coli (*a) indicates the polysaccharide (900 -1200 cm^{-1}) and (b) indicates the band attributed to primary amine (1640 – 1560 cm^{-1}) [31] . For *S. aureus*, the peaks denoted by (c) and (d) represent the C=N and the C-H, respectively [32, 33].

Supplementary information 7.



Supplementary information 7. FTIR spectra of MNPs which did not show significant antibacterial potentials. (*) represent characterizing band.