Electronic Supplementary Material (ESI) for Analytical Methods.

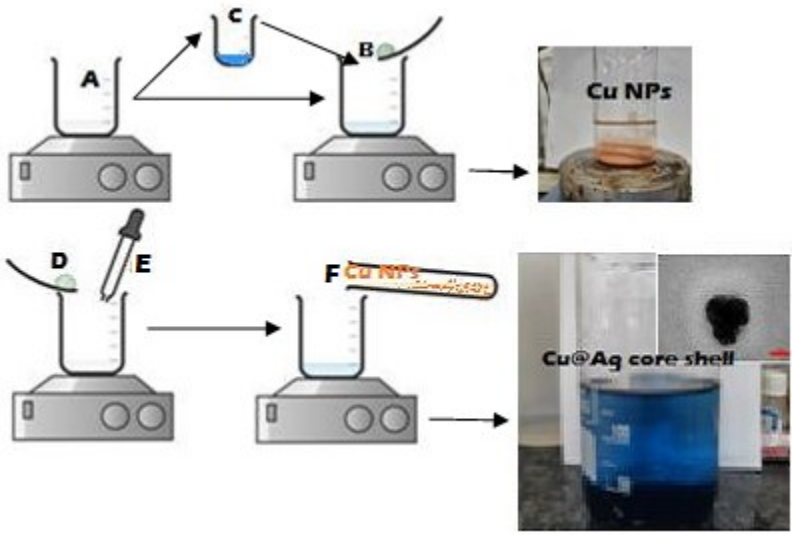

Figure 1S. Two steps synthesis of Cu-Ag core shell nanoparticles A) PVP (k25) B) ascorbic acid, C) copper sulfate, D) silver nitrate, E) ammonia solution, F) Cu NPs dispersed in distilled water.

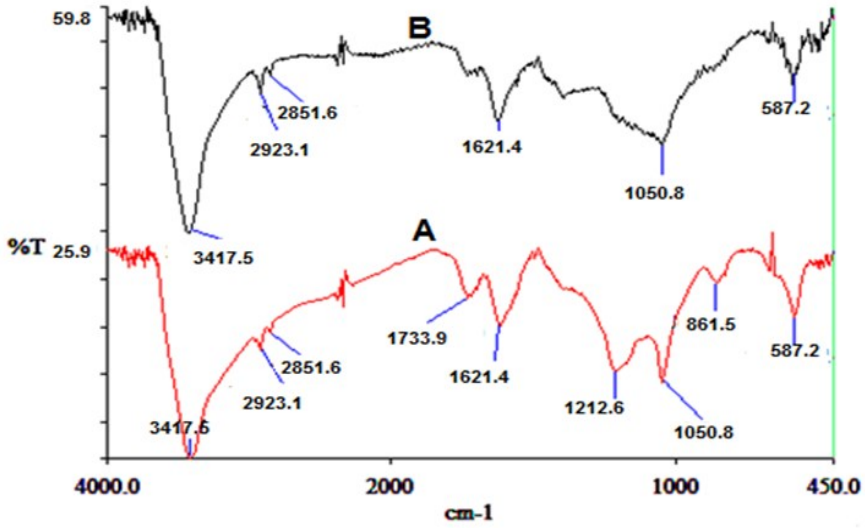

Figure 2S. FT-IR spectrum of (A) graphene oxide and (B) Cu-Ag/GO nanocomposite.

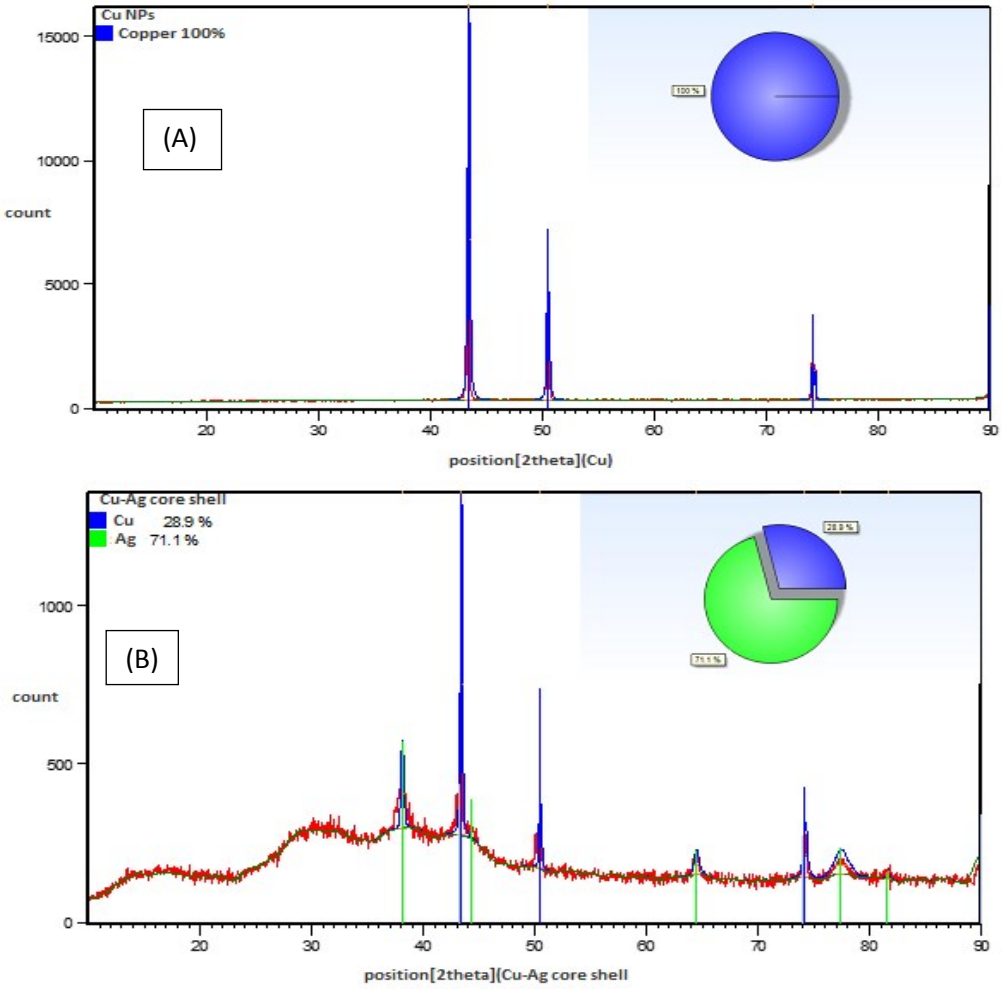

Figure 3S. XRD Analysis of (A) Cu-Ag core shell (B) Cu nanoparticles.

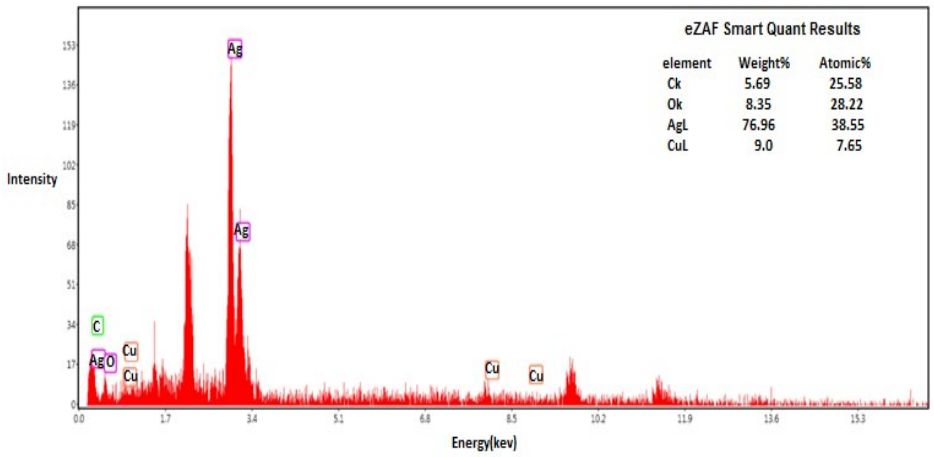

Figure 4S. EDS analysis of GO/Cu-Ag core shell nanoparticles.

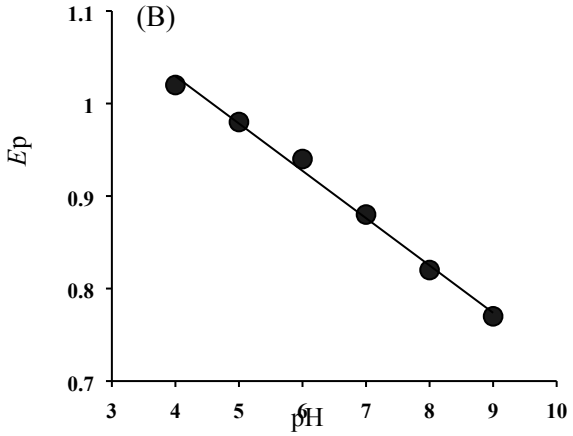

Figure 5S. Plot of oxidation peak potential vs. pH, 400 μM SMZ, scan rate 100 mV/s, Cu-Ag/GO/GCE.

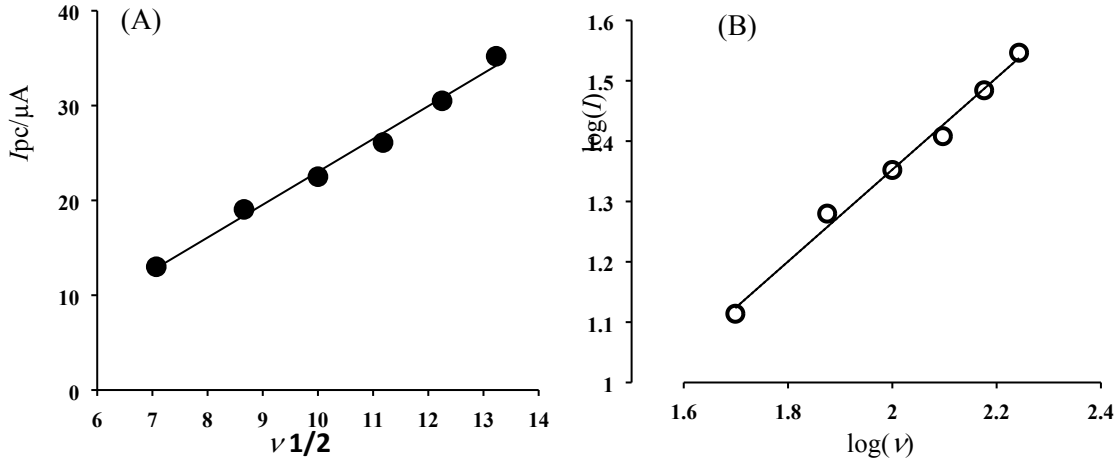

Figure 6S. Plot of (A) anodic peak current vs. square root of scan rates and (B) log*I* (μA) vs. logν, BR buffer solution (pH=6), 500 μM SMZ, Cu-Ag/GO/GCE.

Table 1S. Influence of interference species on the signal changes, Scan rate100 mV/s, Cu-Ag/GO/GCE, BR buffer solution pH=6, SMZ 400 µM.

Interference species	**Conc.(µM)**	**Signal changes%**
Vitamin D_3	100IU	-1.59
lactose	200	1.35
glucose	500	1.14
L-glutamine	400	-2.74
L-lysine	400	-1.91
L-alanine	400	-2.23
Ca^{2+},CO_3^{-2}	500	1.76
K^+, Na^+, Cl^-	500	1.52

Table 2S. Determination of sulfamethazine in spiked milk 3% fat, UHT treated and homogenized long life samples, BR buffer pH=6, scan rate 100 mV/s, proposed sensor and HPLC method.

No. samples	Proposed sensor				HPLC method**		
	Added(mg)	Found(mg)	Recovery%	RSD%	Found(mg)	Recovery%	RSD%
1	10	9.44	94.40	4.10	10.22	102.20	0.032
2	15	14.59	97.30	1.30	14.57	97.15	0.119
3	20	19.80	99.00	2.42	20.53	102.65	0.054

*No. of measurements n=3, ** According to USP 40- NF 35