Electronic Supplementary Information (ESI)

ESI-I

Digestive ripening process has been employed to many materials such as metal, alloys and sulfide. In this process, generally digestive ripening agent was added and solution containing polydispersed larger sized particles of metal, alloys or sulfide was refluxed in presence of ripening agent. The ripening agent offers excess surface active ligands and therefore colloidal solution attains thermodynamic equilibrium resulting in to ultrafine monodispersed particles. Table 1 it is clear that till now polydispersed particles of metal, alloys and sulfide has been processed by digestive ripening to obtain ultrafine monodispersed particles.

Table 1:- Literature survey of materials on which digestive ripening was employed along with their different digestive ripening agents and temperature at which ripening process was carried out.

Sr. No.	Materials	Ripening Agent	Refluxed at temperature
1.	β-Indium Sulfide	alkyl thiolate-capped	190 °C[1]
2.	CdSe and CdTe quantum dots	Trioctylphosphine oxide (TOPO) and oleylamine (OA)	Ripening agent was added during cooling[2]
3.	Cobalt, Iron, and Platinum and their alloy nanoparticles	Trioctylphosphine oxide (TOPO) and oleylamine (OA)	286 °C[3]

4.	**Silver**	**Dodecanethiol ligands**	**110 °C[4]**
5.	**Gold**	**dodecanethiol (RSH), dodecylamine (RNH_2), octadecyl silane ($RSiH_3$), trioctyl phosphine (R_3P), dodecyl bromide (RBr), dodecyl iodide (RI), dodecanol (ROH), and decane (RH).**	**Up to solvent boiling temperature[5]**
6.	**ZnS, CdS, CdSe, PbS**	**toluene t-butyltoluene**	**198 °C[6]**
7.	**Ca**	**Hexadecyl amine (HDA)**	**Room temperature[7]**
8.	**Mg**	**Hexadecyl amine (HDA)**	**Room temperature[8]**
9.	**Indium**	**TOPO, HDA**	**38 °C[9]**

ESI-II

Table 2:- The crystal structures for both the samples i.e. (a) $BiFeO_3$ and (b) Bi_2O_3 particles was identified by selected area electron diffraction (SAED) patterns. Each ring corresponds to specific d-spacing which can be verified from JCPDS data as follows,

(a) JCPDS-86-1518 hexagonal crystal structure for BFO

d-spacing in Å from JCPDS No: 86-1518	d-spacing in Å observed from SAED	plane
3.96	4.04	012
2.81	2.89	110
2.28	2.28	202
1.98	2.03	024
1.81	1.79	211

(b) JCPDS 41-1449 monoclinic crystal structure for Bi_2O_3

d-spacing in $\overset{o}{A}$ from JCPDS No: 41-1449	d-spacing in $\overset{o}{A}$ observed from SAED	plane
3.62	3.63	102
3.30	3.33	111
3.25	3.21	120
2.43	2.45	130
2.13	2.10	122
1.95	1.92	041

ESI-III

Citrate milling process for bulk Fe_2O_3 and Fe_3O_4 particles:-

When Fe_2O_3 was treated with citric acid process [see fig. S1], clear transparent solution obtained indicating no citrate milling occurred. Further, Fe_3O_4 was treated with citric acid [see fig. S2 (a)] gave a yellow solution i.e. Fe_3O_4 particles dissolved in water containing citric acid. Also, TEM images for yellow solution observed after citric acid treatment on Fe_3O_4 particles have shown only presence of citric acid and no traces of metal oxide particles were observed [see fig. S2 (b)].

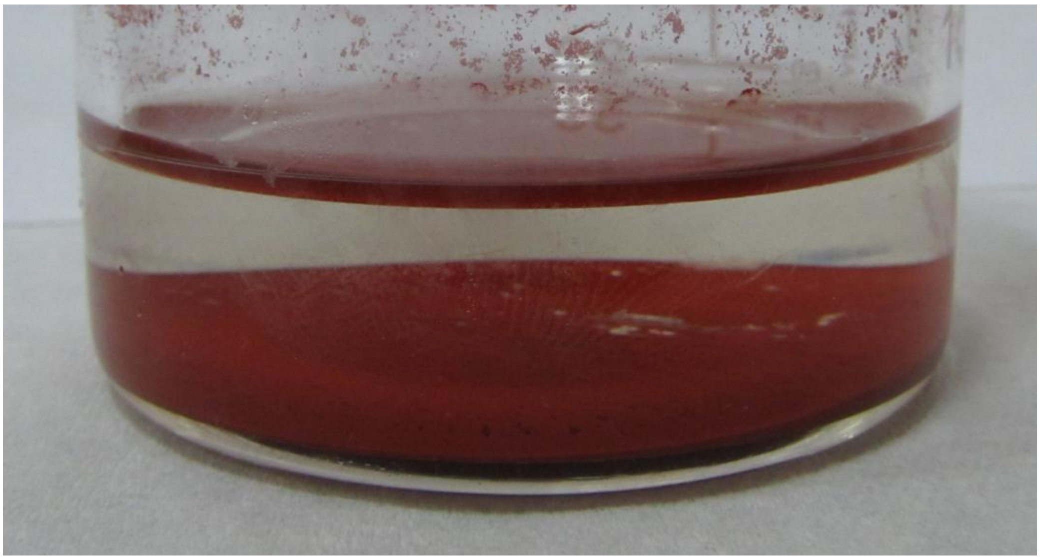

Figure S1: - Photograph of Fe_2O_3 polydispersed bulk powder after citric acid treatment.

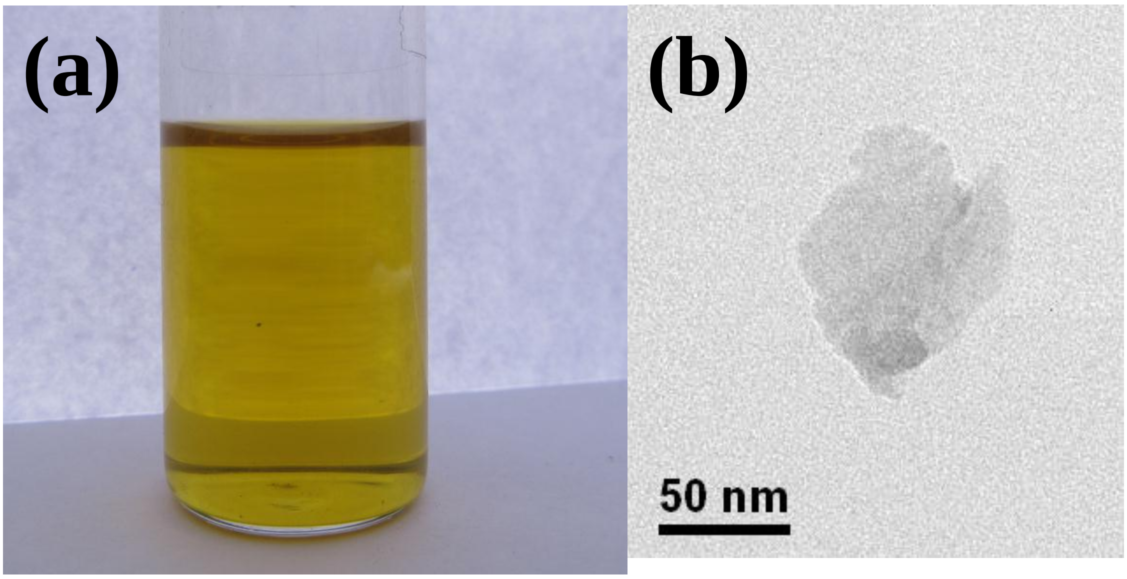

Figure S2: - (a) Photograph of Fe_3O_4 polydispersed bulk powder after citric acid treatment and (b) TEM image after citrate milling of Fe_3O_4 polydispersed bulk powder.

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