Supportive Information

of

Fullerene Stabilized Gold Nanoparticles

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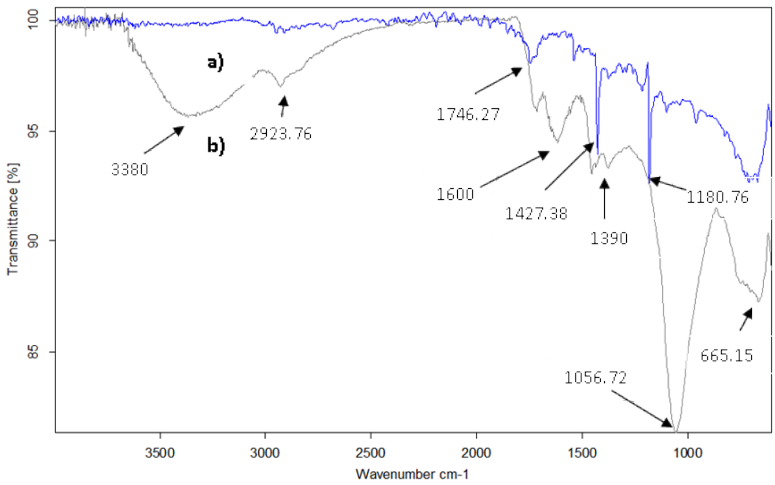
All the chemicals were used as received. [6,6]-Phenyl-C61-butyric acid methyl ester or so called PCBM ($C_{72}H_{14}O_2$ ≥ 99.5% by HPLC with respect to fullerene content, SES research), Glacial acetic acid ($C_2H_4O_2$,Aldrich), Hydrochloric acid (HCl=37%, Aldrich), Toluene (C_7H_8 =99.8%, BDH), Methanol (CH_4O=99.8%, BDH), Diethyl ether ($C_4H_{10}O$ ≥99.0%, Alfa Aesar), Gold(III) chloride trihydrate ($HAuCl_4 .3H_2O$=99.999% trace metals basis, Aldrich), Sodium borohydride($NaBH_4$ =99%, Aldrich), N,N-Dimethylformamide (C_3H_7NO >99%,, Aldrich), Millipore water (18.20 MΩ cm resistivity), N,N-Dimethylformamide (C_3H_7NO >99%, Aldrich),1,2-Dichlorobenzene($C_6H_4Cl_2$=99%, Aldrich), Carbondisulfide(CS_2>99.9%, Alfa Aesar).

Synthesis of [6,6]-phenyl-C61-butyric acid (PCBA) was carried out according to Hummelen, J.C. et al. *J. Org. Chem*. **1995**, 60, 532 – 538.

Characterization

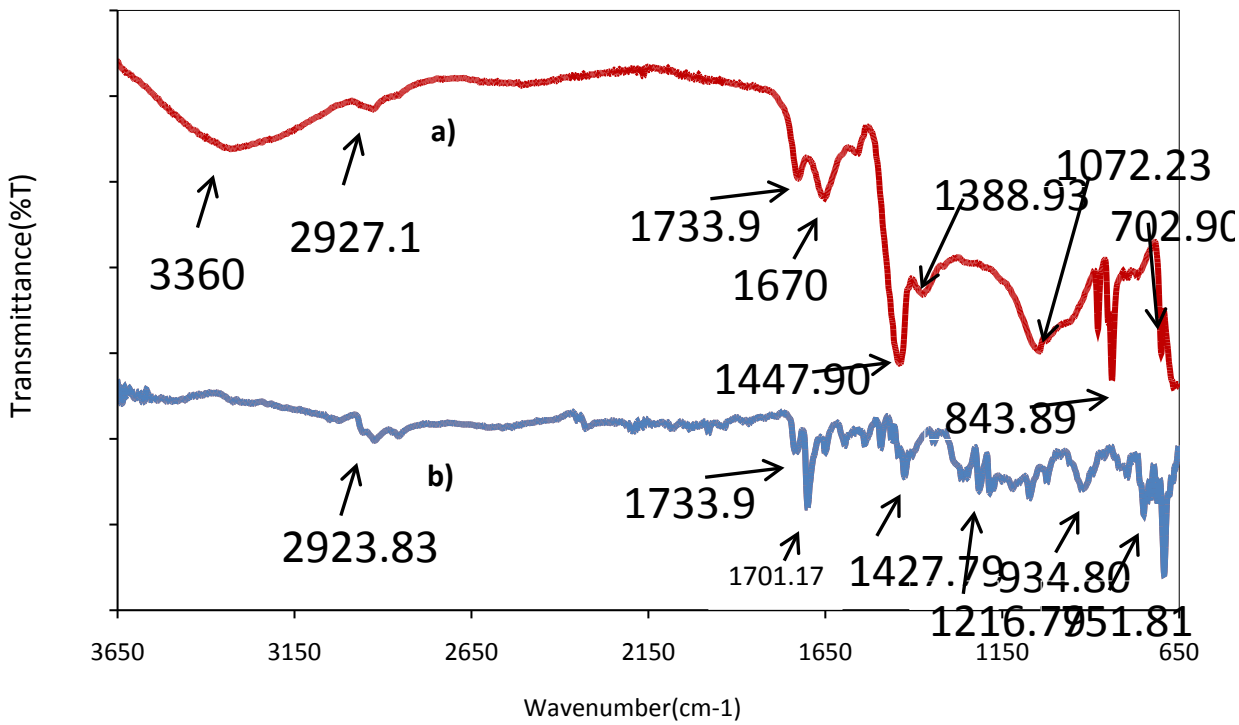
Fourier transform infrared (FTIR) spectra were obtained by using a Perkin-Elmer, Spectrum 100, Universal ATR Sampling Accessory with a range of 650−4000 cm^{-1} in % transmittance mode. UV/Vis spectra were obtained by using Agilent Cary 50 Conc UV-Visible Spectrophotometer using glass cuvette of path length 10mm. Dynamic light scattering (DLS) was carried out by using Zetasizer Nano ZS90 with glass cuvette of 10 mm path length. Zeta potential measurement was carried out using Zetasizer Nano ZS90 with Disposable folded capillary cell. Transmission electron microscopy (TEM) experiments were performed using a JEOL JEM3200FS Cryo-Electron Microscope with an acceleration voltage of 300 kV and more without the cryogenic condition. Carbon coated copper grids with 400 mesh (TED PELLA INC.) were used for TEM imaging. 30 microliter of sample was deposited onto it and led it dry on the grid. AFM was obtained by using Bruker Fastscan Scanasyst type instrument. A drop of nanoparticle sample was deposited on mica substrate and led to dryness for analysis. XRPD was carried using Bruker D8 Discover XRD equipped with Cu Kα radiation.

FTIR



Functional groups of C_{60}-AuNPs	Wave number(cm^{-1})
C-H stretching	2924
O-H stretching	3380
C-O stretching	1056
C-OH bending	1390
C=C stretching	1600
Functional groups of C_{60}	**Wave number(cm^{-1})**
C_{60} ring stretching-Tu(3)	1180
C_{60} ring stretching-Tu(4)	1427

Figure 1s. FTIR of a) C_{60} only and b) C_{60}-AuNPs (**1**).



Functional groups of PCBA-AuNPs	Wave number(cm^{-1})
Alkyl C-H stretching	2928
O-H stretching	3380
C-O stretching	1072
C-OH bending	1389
C=C stretching	1586

Figure 2s. FTIR of a) PCBA-AuNP (**2**) and b) PCBA only.

X-ray Powder diffraction (XRPD):

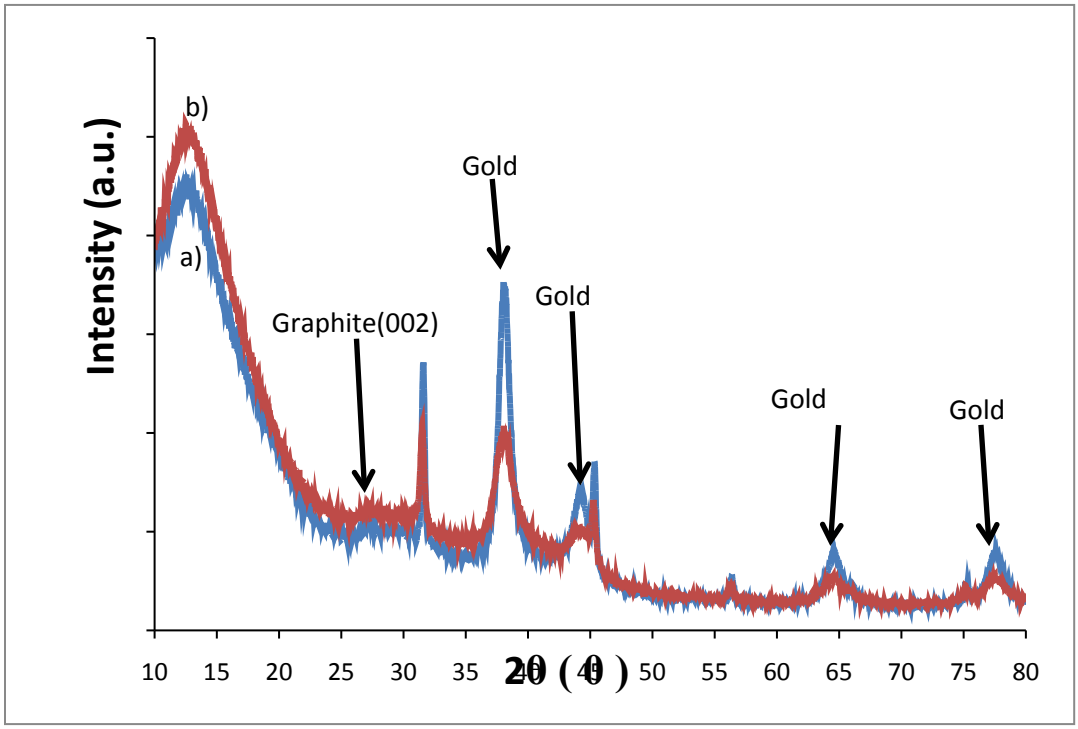


Figure 3s. XRD pattern of a) C_{60}-AuNPs and b) PCBA-AuNPs

TEM

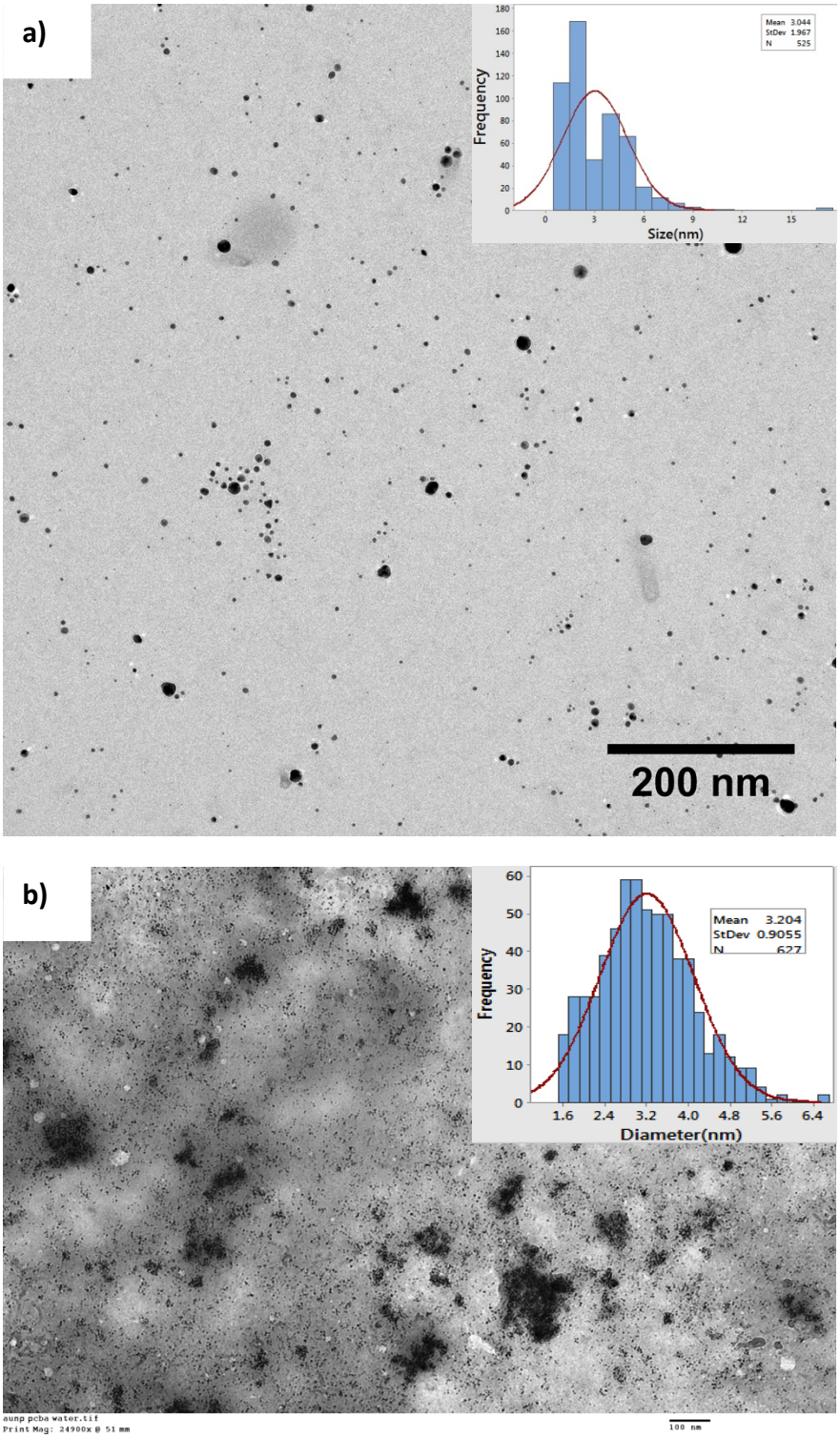


Figure 4s. TEM of a) C_{60}-AuNPs (**1**), inset: size distribution of the C_{60}-AuNPs b) PCBA-AuNPs(scale bar =100nm), inset: size distribution of the PCBA-AuNPs.

Dynamic Light Scattering (DLS)

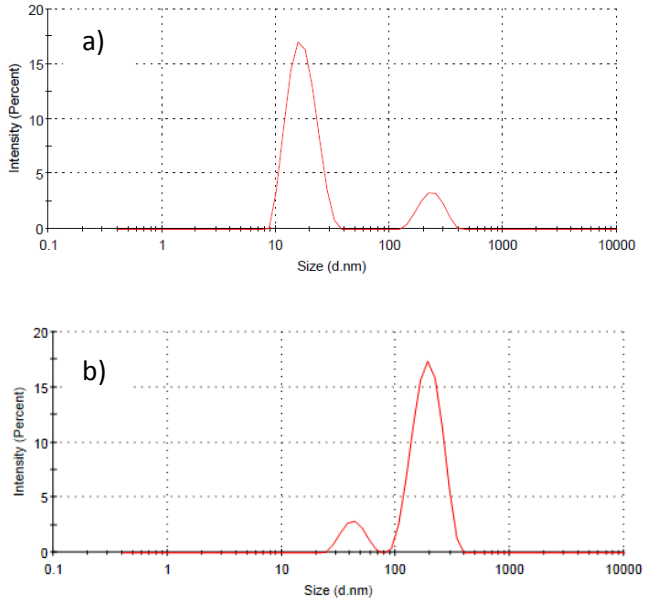
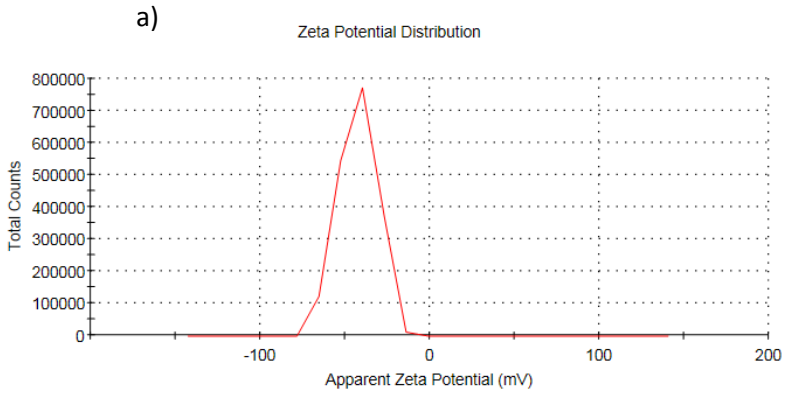


Figure 5s. Dynamic light scattering of the a) C_{60}-AuNPs(**1**) in DMF, b) PCBA-AuNPs (**2**) in H_2O.

Zeta potential:



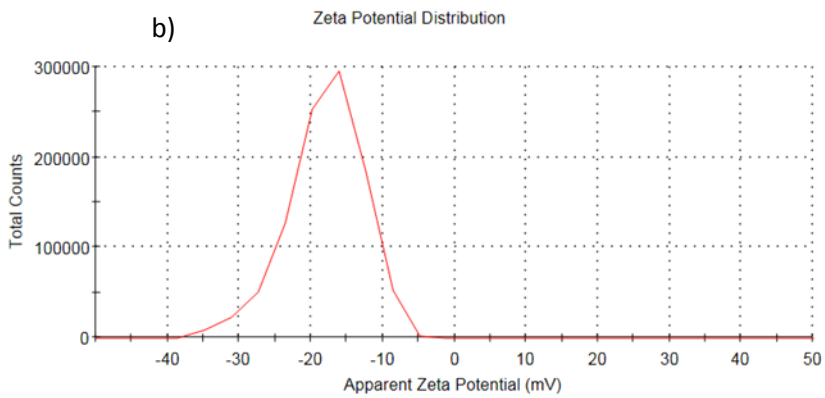


Figure 6s. Zeta potential of the a) C_{60}-AuNPs(**1**) in DMF. b) PCBA-AuNPs (**2**) in H_2O.