Supporting information:

Tuning the optical characteristics of poly(p-phenylenevinylene) by in-situ Au-nanoparticle generation

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Polymer (DHPPV) was synthesised and well characterized with various spectroscopic tools such as FTIR, ^{1}HNMR, ^{13}CNMR. Molecular weight was determined by using gel permeation chromatography and found to be 34410, PDI=2.10. DHPPV is thermally stable up to 400 ^{o}C determined by using TGA.

Instrument Description: Scanning electron micrograph (SEM) images were obtained by means of a LEO-1430 VP electron microscope and ZEISS Sigma VP Field Emission Scanning electron micrograph (FESEM)on samples glued on an aluminum stub and gold sputtered. FT-IR analysis was carried out on air-dried samples with a Perkin Elmer-Spectrum One FT-IR Spectrometer from 4000 to 450 cm-1. UV-visible spectra were recorded, by dissolving a calculated amount of the sample in an appropriate solvent, on a Hitachi UV–visible U–2001 Spectrophotometer or on a Perkin Elmer Lambda 25 UV–visible Spectrophotometer. For the PL measurements, a Varian Cary Eclipse fluorescence spectrophotometer was used. The excitation wavelengths of these samples were in the range of 480 nm to 434 nm. Transmission Electron Microscopy (TEM) of the composite solutions, placed on carbon coated copper grids, was performed using JEOL-2100 equipment operating at a maximum acceleration voltage at 200 kV. The TEM samples were prepared by drop casting the liquid samples on copper grid of 300 mesh followed by evaporation of solvent at room temperature. Particle Size Analysis was done by Differential Light Scattering (DLS) method. 20 mL portion (in chloroform) of the DHPPVAuNP in chloroform solution was taken in a cell for which particle size distribution was measured using a HORIBA LB-550 instrument.

Figure S1: **^{1}HNMR** Spectra of DHPPV in $CDCl_3$**.**

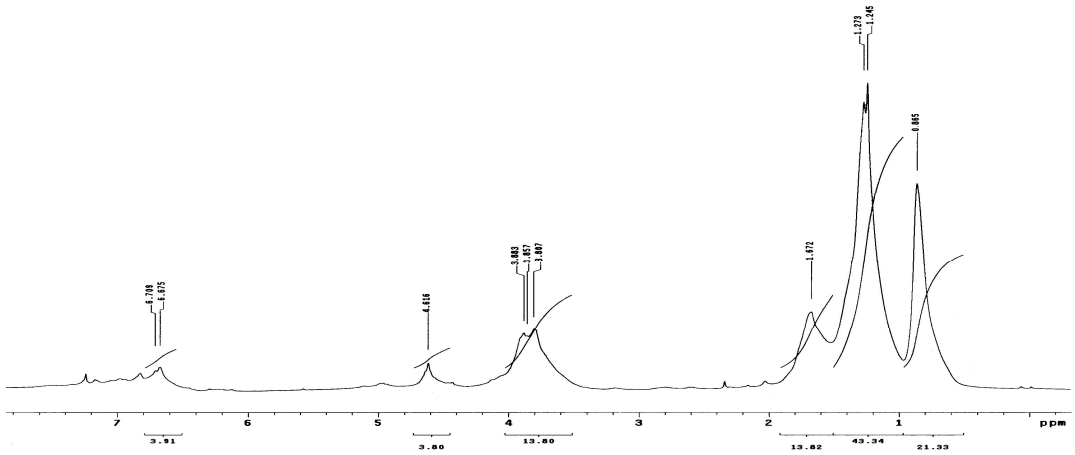


Figure S2: **^{13}CNMR** Spectra of DHPPV in $CDCl_3$

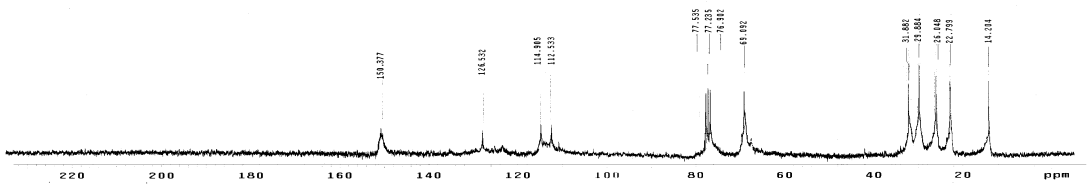


Figure S3: **FTIR** spectra of DHPPV.

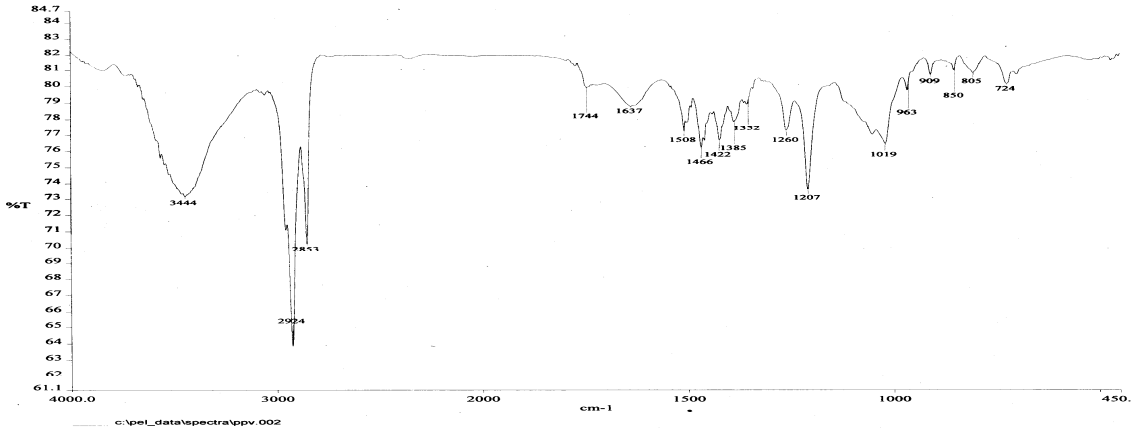
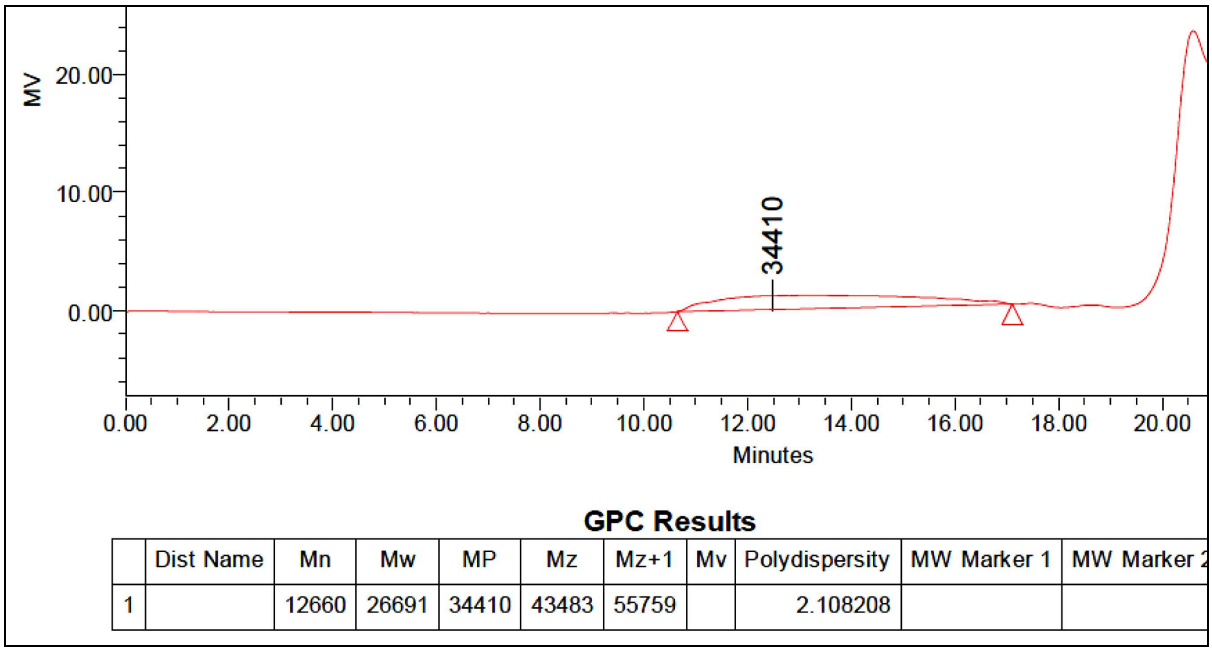


Figure S4: **Gel Permeation Chromatography** of DHPPV (**Mol wt. =34410, PDI=2.10**)



GPC Results

	Dist Name	Mn	Mw	MP	Mz	Mz+1	Mv	Polydispersity	MW Marker 1	MW Marker 2
1		12660	26691	34410	43483	55759		2.108208		

Figure S5: **TGA** of DHPPV in THF(tetrahydrofuran).

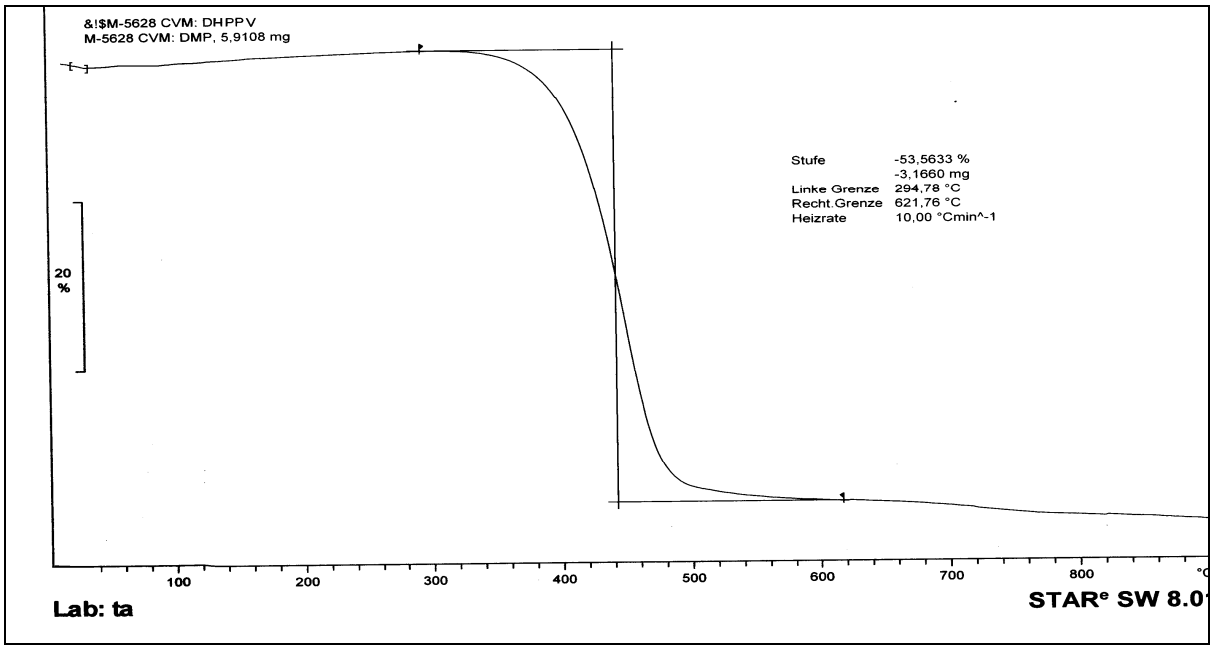


Figure S6: **SEM** Micrograph of DHPPVAu nano composite.

A= DHPPVAuNP composite at 12 μL $HAuCl_4$ concentration. B= DHPPVAuNP composite at 18 μL $HAuCl_4$ concentration. C= DHPPVAuNP composite at 24 μL $HAuCl_4$ concentration. D= DHPPVAuNP composite at 60 μL $HAuCl_4$ concentration

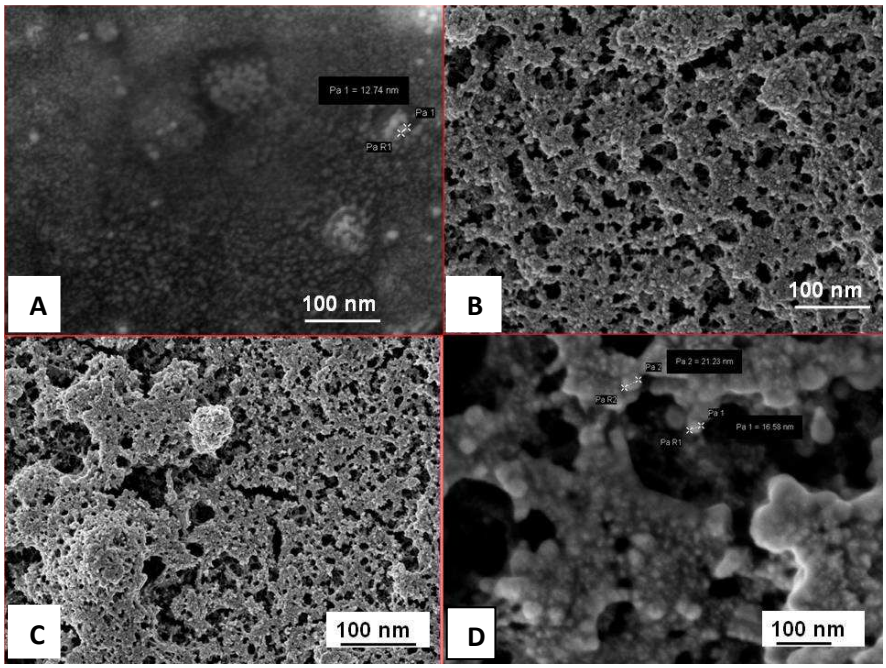


Figure S7: **EDX** Profile of DHPPV.

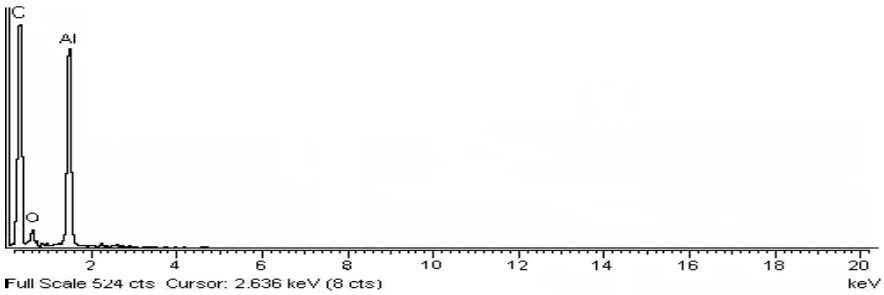


Figure S8: **EDX** Profile of DHPPVAu NP composite 6μL HAuCl4.

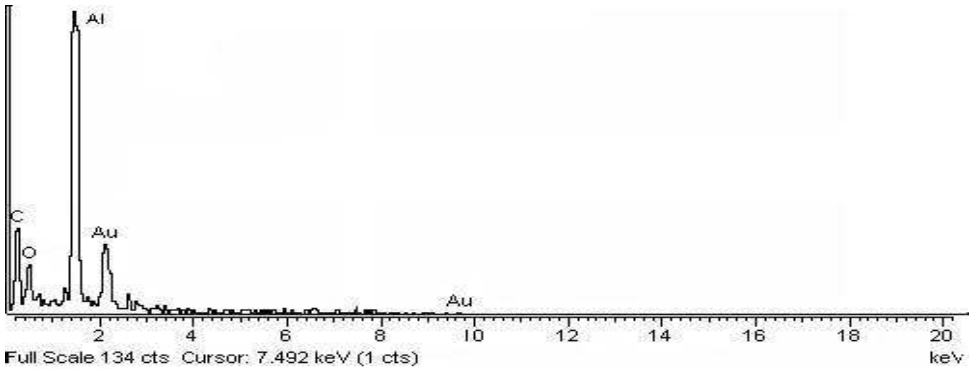
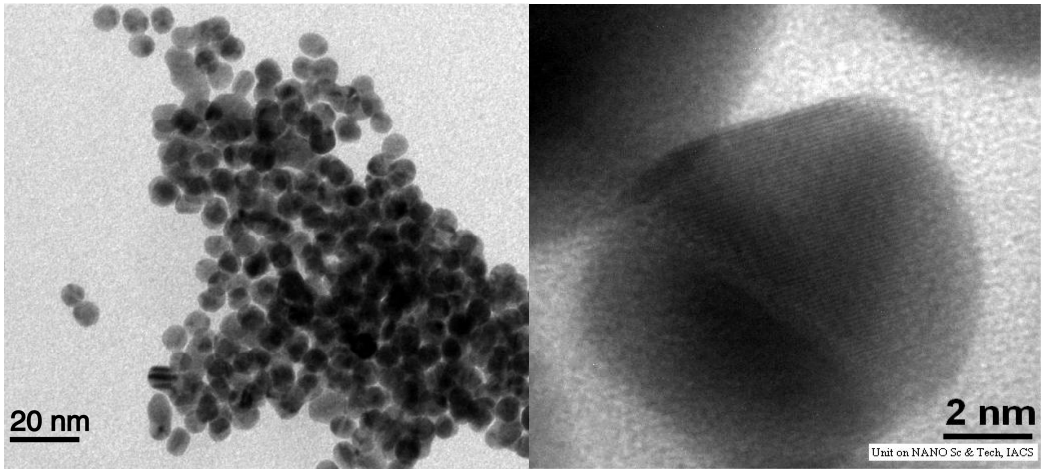


Figure S9: **TEM** image of DHPPV-AuNP composite at 12 μL (A) and 60 μL (B) of $HAuCl_4$ concentration.

A



B

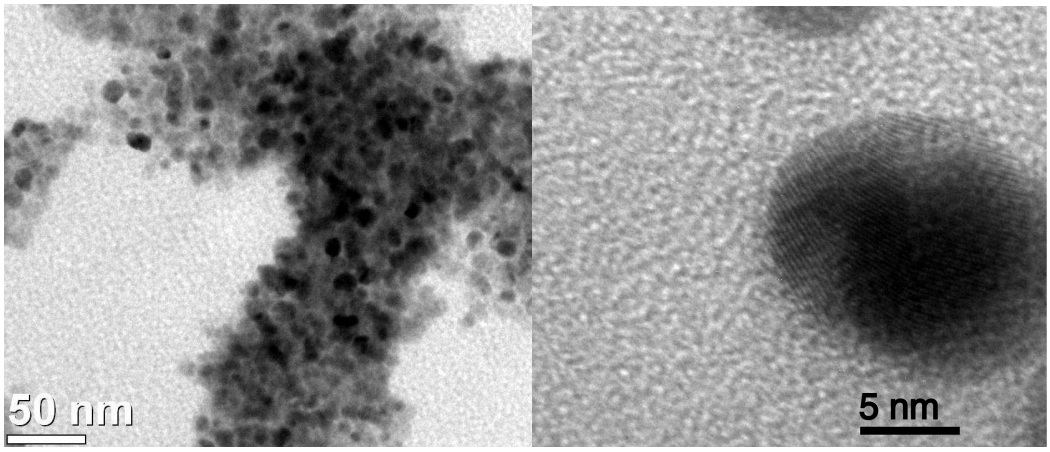


Figure S10: ^{1}HNMR Spectra of DHPPV-AuNP composite in $CDCl_3$.

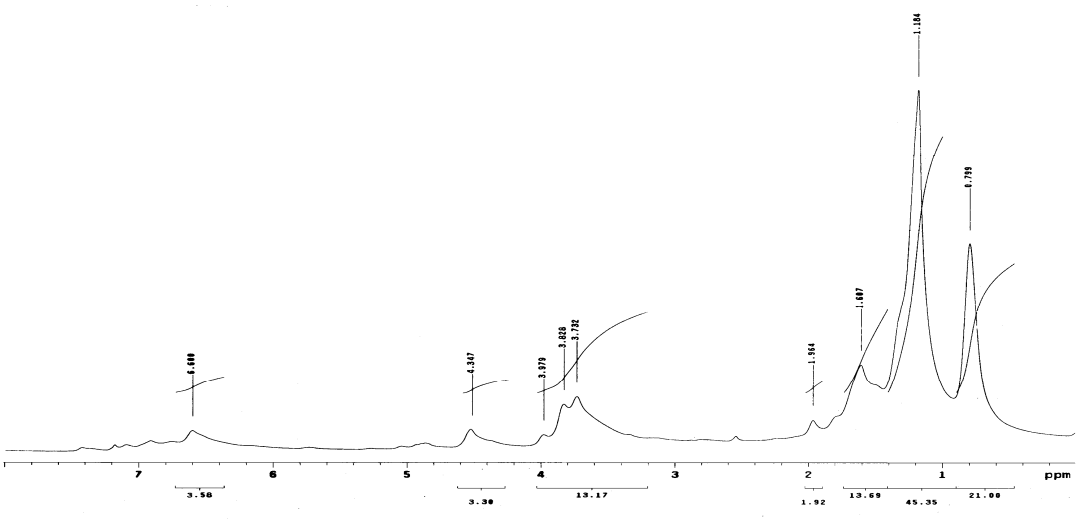


Figure S11: ^{1}HNMR Spectra of octadecanethiol treated DHPPV-AuNP composite in $CDCl_3$.

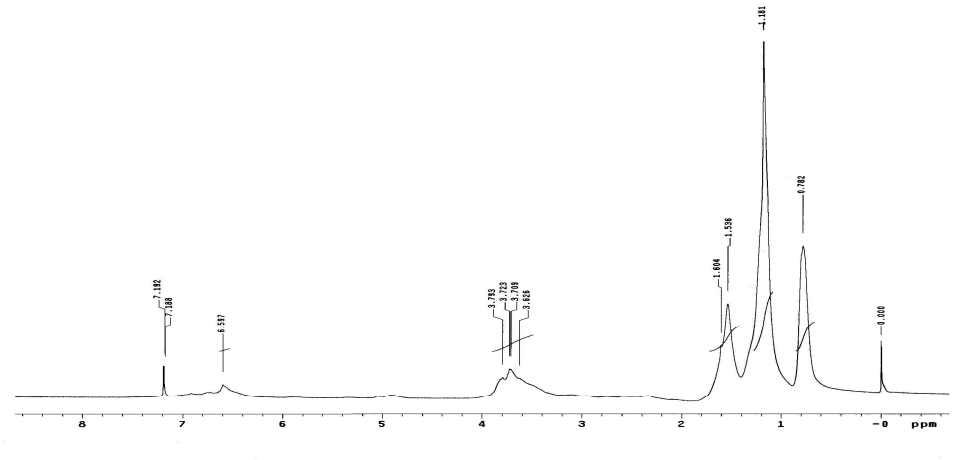


Figure S12: Particle distribution in various $HAuCl_4$ concentration.

A= DHPPVAuNP composite at 12 μL $HAuCl_4$ concentration. B= DHPPVAuNP composite at 18 μL $HAuCl_4$ concentration. C= DHPPVAuNP composite at 24 μL $HAuCl_4$ concentration. D= DHPPVAuNP composite at 60 μL $HAuCl_4$ concentration

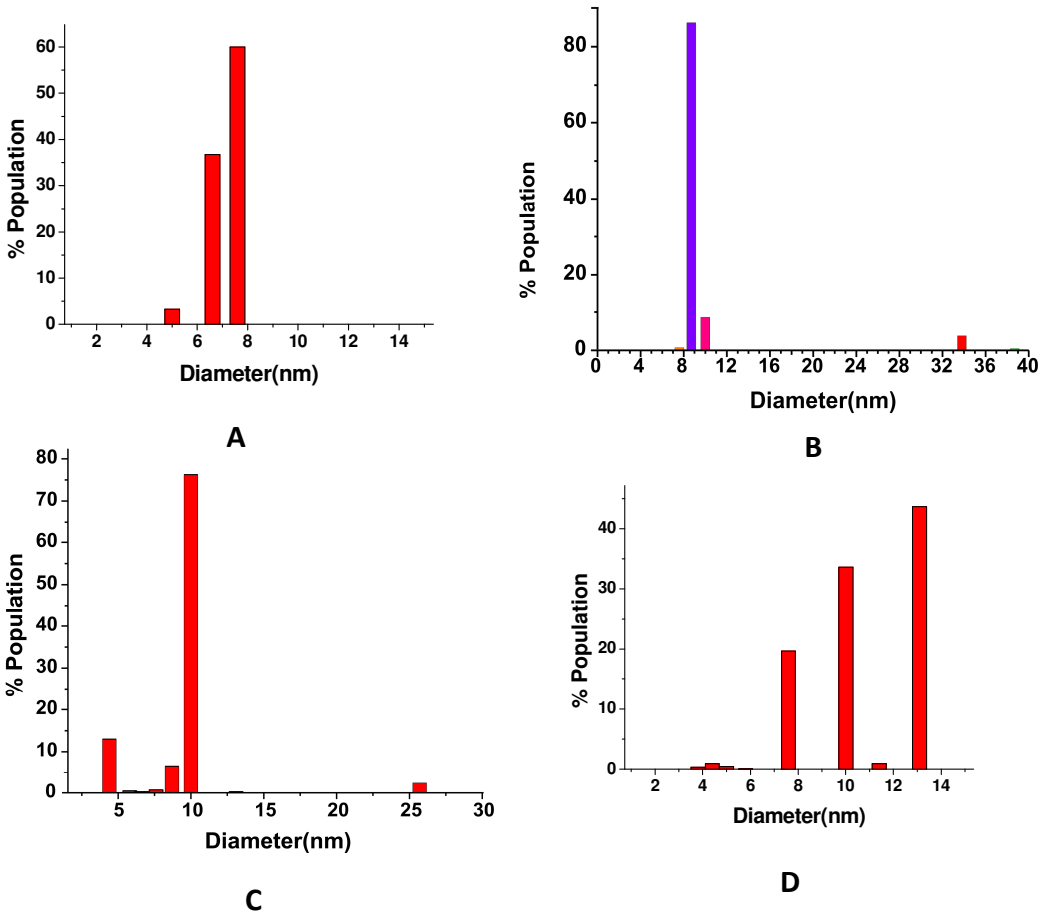


Figure S13. UV/Vis spectra of DHPPV and its nanocomposites at varying quantity of $HAuCl_4$ in Chloroform.