

Supplementary Information

Rapid Microwave Synthesis of White Light Emitting Magic Sized Nano Clusters of CdSe : Role of oleic acid.

*Aditi A. Jadhav, Priyesh V. More and Pawan K. Khanna**

Reproducibility testing of CdSe MSNCs experiments.

The experiments were repeated several times on domestic microwave oven and results were similar as presented in the paper. The experiments were also conducted on laboratory standard MW oven (Description- CEM model no. 908010, (USA)) for authenticity at similar MW power, at 100 °C and it is observed that reaction time get reduced as compared to domestic MW oven. The results obtained by using laboratory standard MW oven were compared with conventional MW oven which are presented in Table S 1.

Synthesis of CdSe MSNCs by using laboratory standard MW oven:

Cadmium acetate (2.25 mmol) and cyclo-octeno-1,2,3- selenadiazole (2.3 mmol) were taken in 1:1 proportion. Initially, cadmium acetate and oleic acid (5 ml) were taken in 50 ml round bottom flask subjected to microwave irradiation (power, 180 watt, 100 °C) for 2 min in order to form a cadmium precursor. Subsequently, cyclo-octeno 1, 2, 3-selenadiazole pre-dissolved in diphenyl ether (10 ml) were added to the round bottom flask Thereafter, microwave irradiation was continued for 8 minutes at 180 watt power and 100 °C temperature under reflux condition. For work up hexane and methanol added for precipitation of nanoparticles. CdSe MSNCs were separated by centrifugation with repeated washing with methanol and dried in hot air oven at about 50 °C. Yellowish orange powder is obtained, which was used for characterization.

Table SI 1: Analytical data of CdSe MSNCs synthesized using domestic/conventional and laboratory standard MW oven.

Compounds	Reaction Time (min.)	$\lambda_{(abs)}$ (nm)	$\lambda_{(em)}$ (nm) ($\lambda_{(ex)}$ @ 350 nm)	% Yield
C8 (Conventional MW, CM)	12-15	370, 390, 450	396, 441 & 507	55%
C8 (Lab Standard MW , LM)	8	370, 390	396, 440 & 510	58%

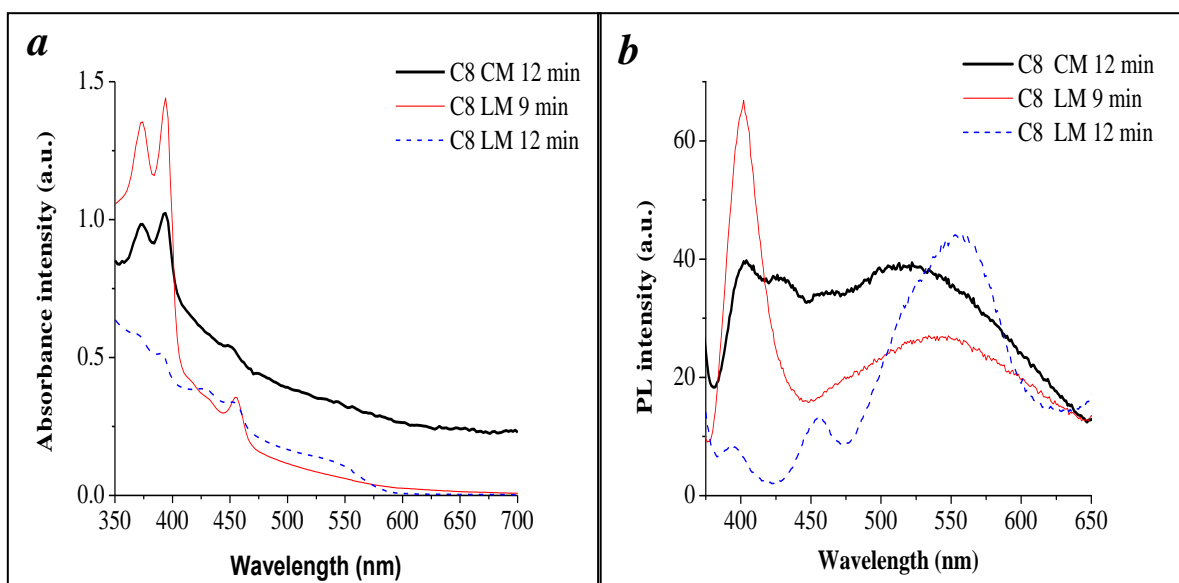


Fig. SI 1. UV–Visible spectra (a), PL spectra (b) of CdSe MSNCs synthesized using conventional (CM) and laboratory standard (LM) MW oven.

Table SI 2. Reaction parameters yielding various types of CdSe.

Method	Time	Temperature	OLA (ml)	CdSe particle type
Microwave	12 min	-	5	MSNCs
Microwave	12 min	-	10	MSNCs + Regular QDs
Microwave	12 min	-	15	Regular QDs
Thermal ¹	180 min	180°C	30	Regular QDs
Thermal ²	180 min	150°C	10	MSNCs

1. P. K. Khanna, R. K. Beri, P. V. More, B. G. Bharate, *Current Appl. Phys.* **2010**, *10*, 253,
2. a) P. K. Khanna, R. K. Beri, *J Nanosci. Nanotechnol.* **2011**, *6*, 5137, b) R. K. Beri, P. K. Khanna, *CrystEngComm*, **2010**, *12*, 2762.

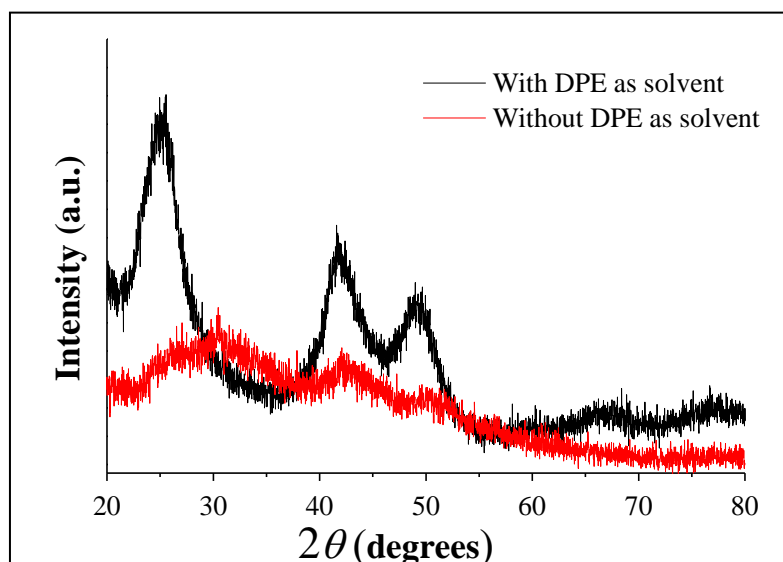


Fig. SI 2. XRD spectra of C8 samples prepared in presence and absence of DPE as solvent

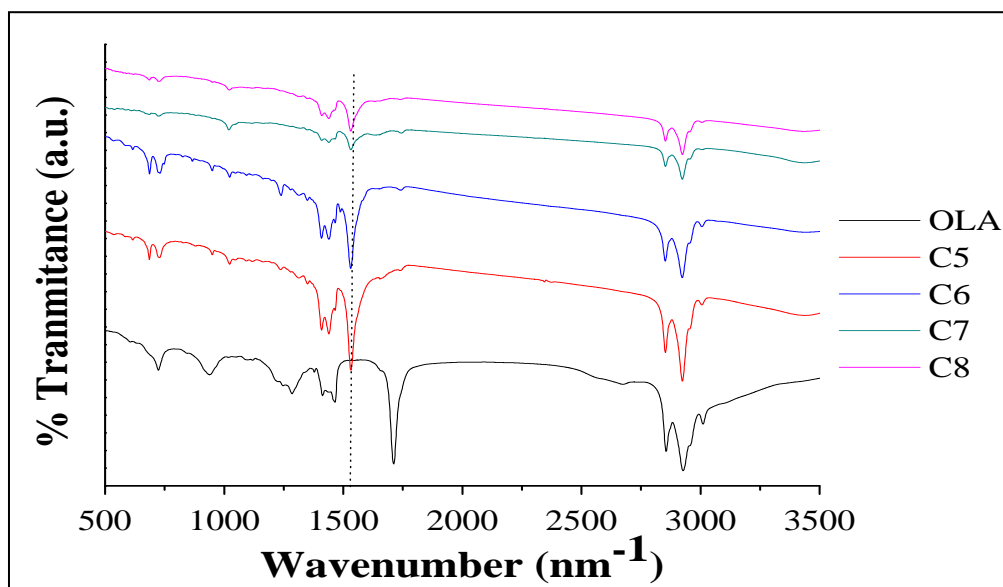


Fig. SI 3. FT-IR spectra of CdSe MSNCs prepared by using various selenadiazoles and OLA.

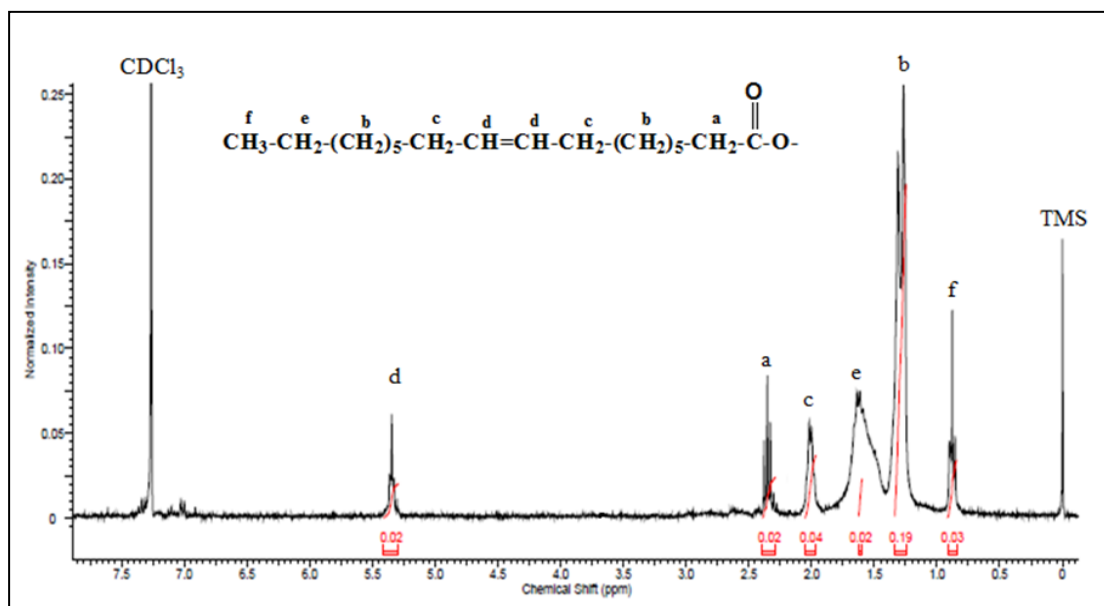


Fig. SI 4. ^1H NMR spectrum of C8 CdSe MSNCs.

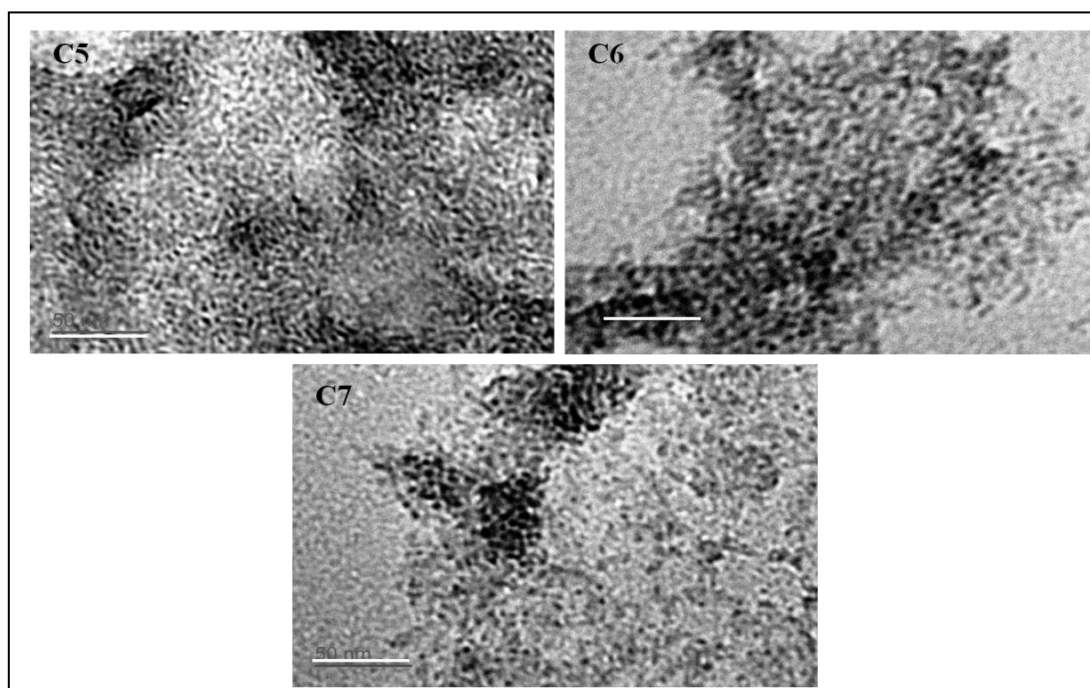


Fig. SI 5. TEM images of various CdSe MSNCs prepared by C5, C6 and C7 Se-precursors. Scale bar is 50 nm for all the samples.

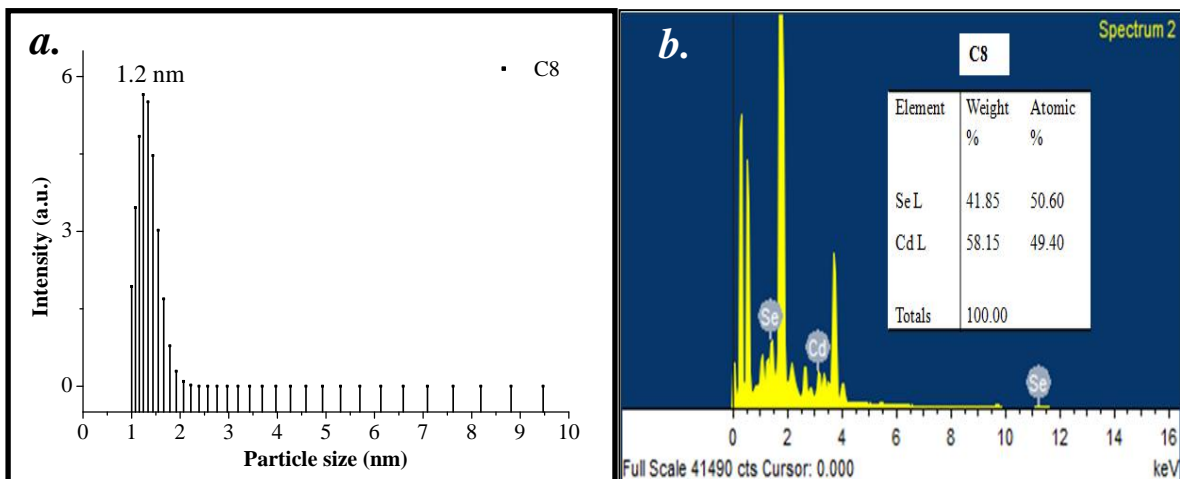


Fig. SI 6. EDAX analysis (a) and particle size (DLS) analysis (b) of CdSe MSNCs of C8 sample.

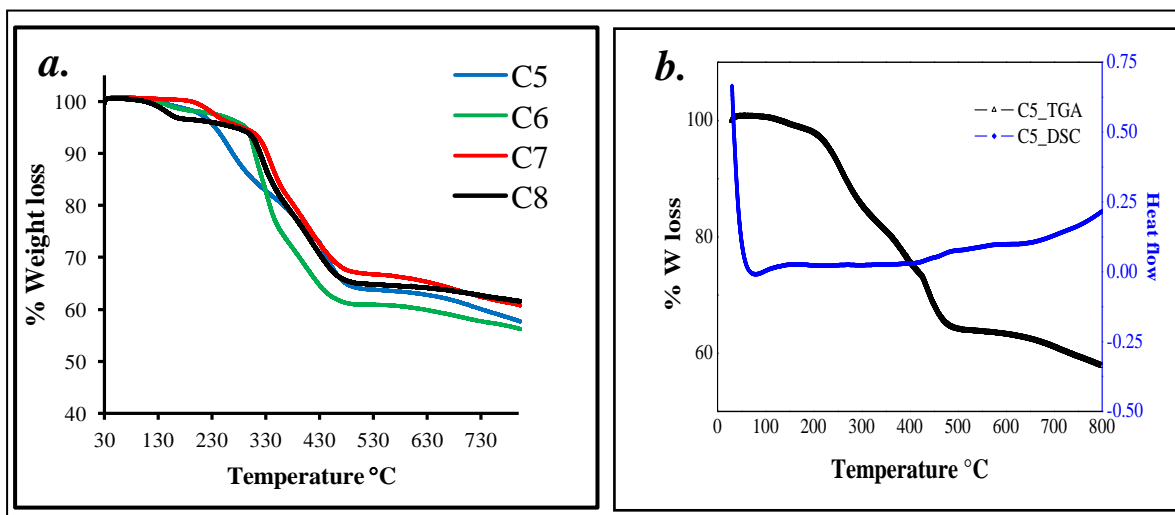


Fig. SI 7. a) TGA analysis of various CdSe MSNCs samples b) TGA-DTA analysis of CdSe MSNCs prepared by C5.