

Supporting information

Controlled aggregation of quantum dot dispersions by added amine bilinkers and effects on hybrid polymer film properties

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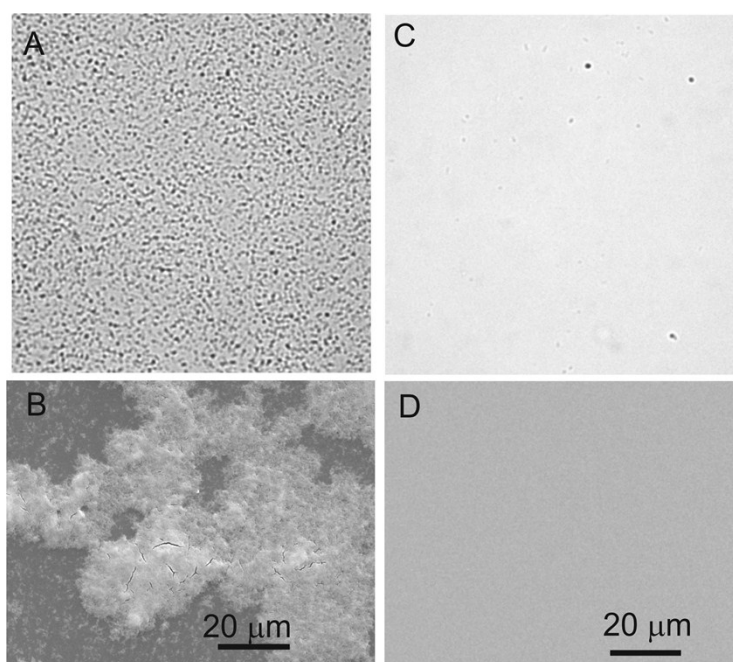


Fig. S1. Effect of 1-propylamine volume fraction on morphology of spin coated ZnO films. Optical microscopy (A) and SEM image (B) for ZnO film deposited from nanocrystals dispersed in CHCl_3 (0 % 1-PA). Optical microscopy (C) and SEM image (D) for ZnO film deposited from blend of CHCl_3 /1-PA (13 % 1-PA). The size of the optical microscopy images is 400 x 400 μm .

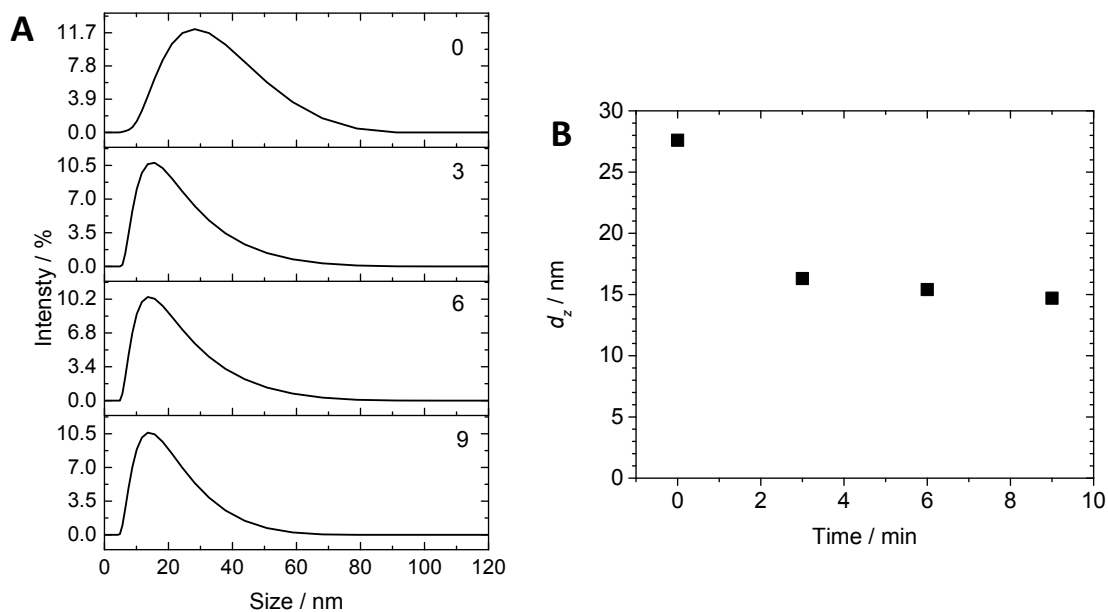


Fig. S2 Reversible aggregation of ZnO. 1-HT was added ($MR = 0.1$) to ZnO dispersed in CHCl_3 solution containing 13 vol.% 1-PA and DLS data (A) were measured at different times (shown in min.) after addition and the d_z values are shown in (B).

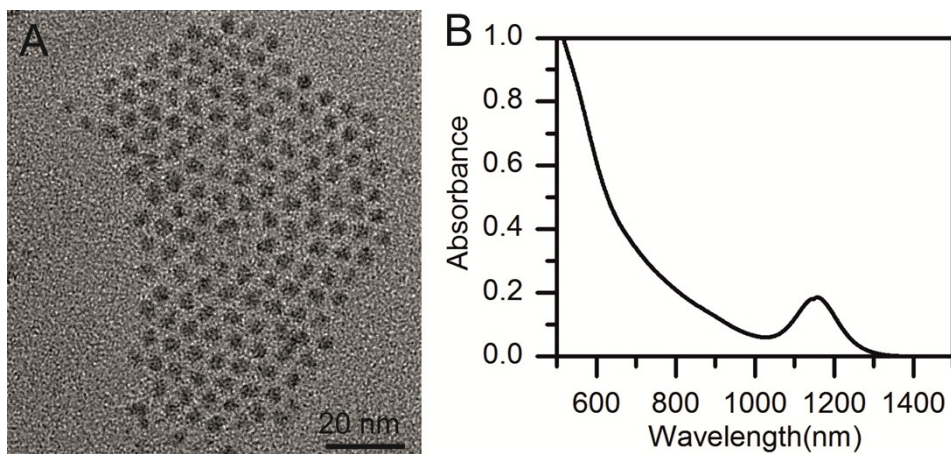


Fig. S3 TEM (A) and UV-vis-NIR data (B) for PbS nanocrystals. The scale bar for (A) is 20 nm. The nanocrystals were dispersed in CHCl_3 for the UV-visible spectrum shown in (B).

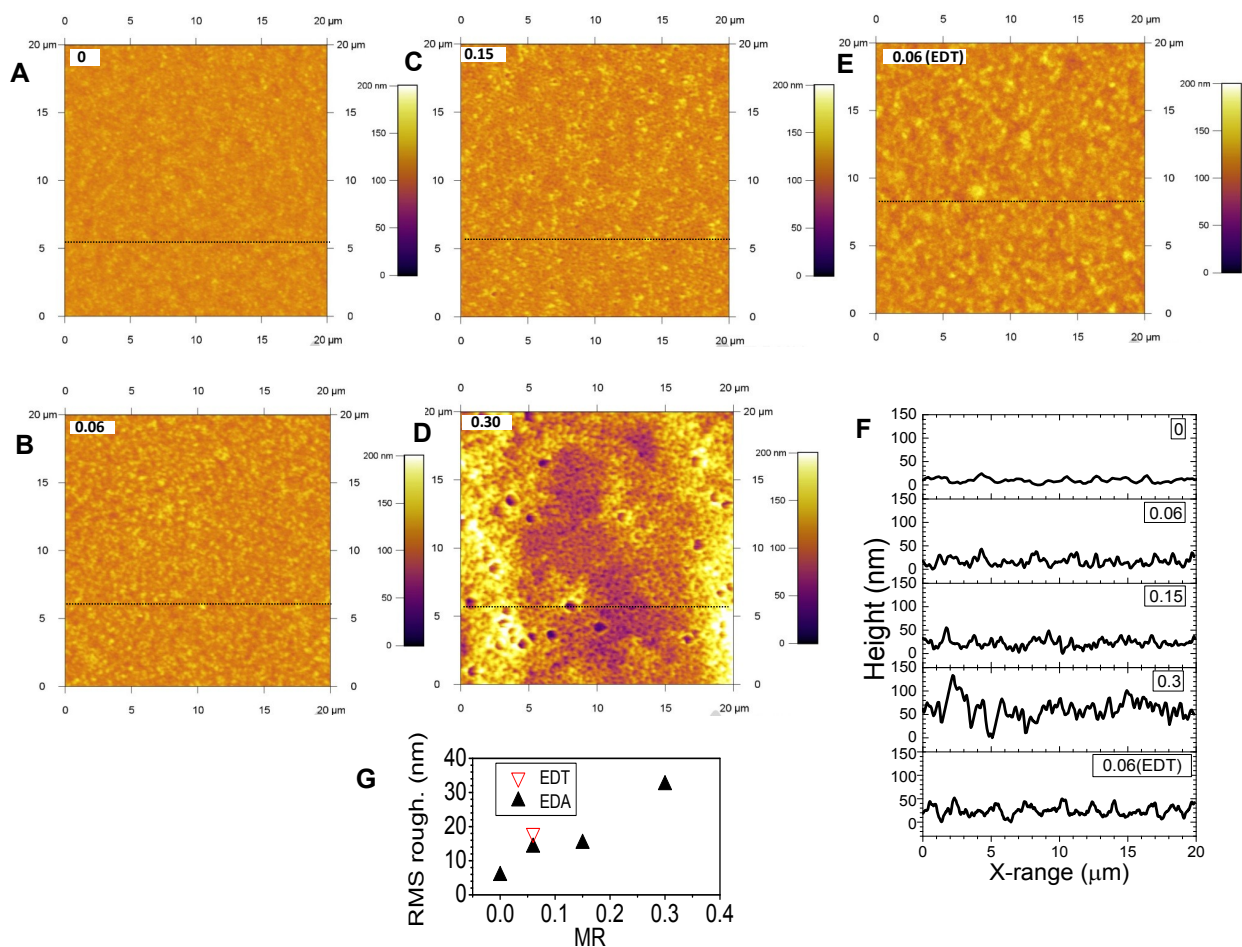


Fig. S4. Large area AFM images and line profiles for P3HT/ZnO films. (A to E) show AFM images for films with various *MR* values (shown). (F) shows the line profiles for each film obtained as indicated in the respective images. (G) shows the variation of roughness with *MR*. The bilinker used was EDA unless otherwise stated.

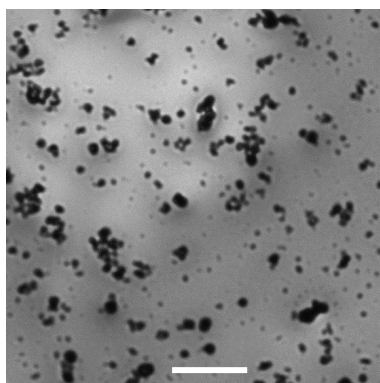


Fig. S5. Morphology of P3HT/ZnO film prepared without added 1-PA. Optical micrograph for a film prepared without 1-PA. The scale bar is 20 μm.

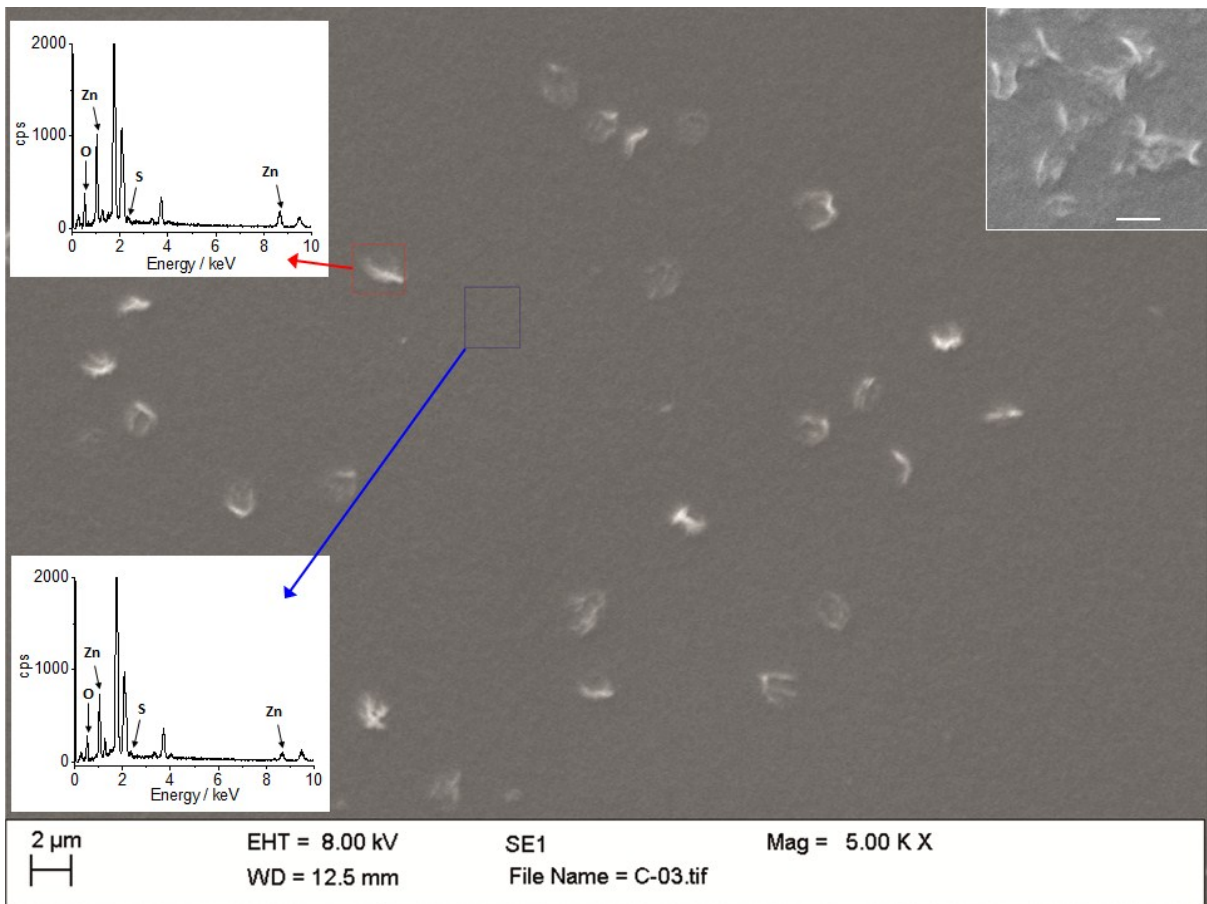


Fig S6. SEM images showing crater-like aggregates. The film was prepared using $MR = 0.15$ and a mixing of 5 min. EDX spectra are shown for a crater-like aggregate and a region without the aggregates. The inset on the top right hand corner shows an SEM image for a film prepared using $MR = 0.6$ and a mixing of 1 min. The scale bar is $2 \mu\text{m}$ and applies to both SEM images.

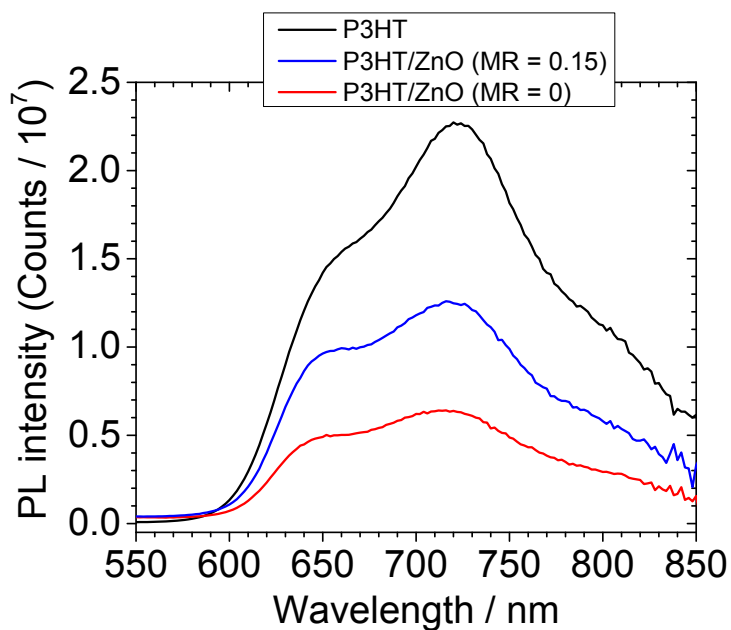


Fig S7. Photoluminescence spectra of P3HT/ZnO films. The excitation was performed at 430 nm and the intensities were corrected for the optical density of the films. Data for P3HT are shown for comparison. The bilinker used was EDA.