Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Facile and Greener One Pot Synthesis of Zinc Sulphide Quantum Dots Employing Zinc based Ionic Liquids and their Photocatalytic Activity

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Supporting Information

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Annexure S1: Characterization of [$C_n$mim][$ZnCl_3$] ILs

^{1}H NMR and mass spectroscopy data for synthesized MILs:

[C_4mim][$ZnCl_3$]: ^{1}H NMR (500 MHz, 10% D_2O and 90% H_2O, δ-ppm) 0.89 (t, 3H, C*H*$_3$), 1.284 (m, 2H, (-C*H*$_2$-CH_3)), 1.815 (q, 2H, (N^+-CH_2- C*H*$_2$-)), 3.858 (s, 3H, N-C*H*$_3$), 4.16 (t, 3H, N^+-C*H*$_2$-CH_2-), 7.40 (s, 1H, N-C*H*-CH-N^+), 7.44 (s, 1H, N-CH-C*H*-N^+), 8.67 (s, 1H, N-C*H*-N^+). ESI-HRMS positive ions m/z (for $C_8H_{15}N_2^+$): 139.1155, 140.1185 and negative ions m/z (for $ZnCl_3^-$): 170.8129, 172.8108, 168.8162, 176.8061

[C_8mim][$ZnCl_3$]: ^{1}H NMR (500 MHz, 10% D_2O and 90% H_2O, δ-ppm) 0.88 (t, 3H, C*H*$_3$), 1.30 (br m, 2H, (-C*H*$_2$-CH_3)), 1.89 (q, 2H, (N^+-CH_2- C*H*$_2$-)), 3.91 (s, 3H, N-C*H*$_3$), 4.21 (t, 3H, N^+-C*H*$_2$-CH_2-), 7.45 (s, 1H, N-C*H*-CH-N^+), 7.50 (s, 1H, N-CH-C*H*-N^+), 8.73 (s, 1H, N-C*H*-N^+). ESI-HRMS positive ions m/z (for $C_{12}H_{23}N_2^+$): 195.1807, 196.1837 and negative ions m/z for $ZnCl_3^-$): 170.6735, 172.6691, 168.6781, 174.6655, 174.6604.

[C_{16}mim][$ZnCl_3$]: ^{1}H NMR (500 MHz, 10% D_2O and 90% H_2O, δ-ppm) 0.88 (t, 3H, C*H*$_3$), 1.29 (br m, 2H, (-C*H*$_2$-CH_3)), 1.92 (q, 2H, (N^+-CH_2- C*H*$_2$-)), 3.98 (s, 3H, N-C*H*$_3$), 4.30 (t, 3H, N^+-C*H*$_2$-CH_2-), 7.58 (s, 1H, N-C*H*-CH-N^+), 7.62 (s, 1H, N-CH-C*H*-N^+), 9.04 (s, 1H, N-C*H*-N^+). ESI-HRMS positive ions m/z (for $C_{20}H_{39}N_2^+$): $^+$): 307.2998, 308.3025 and negative ions m/z for $ZnCl_3^-$): 170.8131, 172.8103, 168.8161, 174.8075, 174.8057.

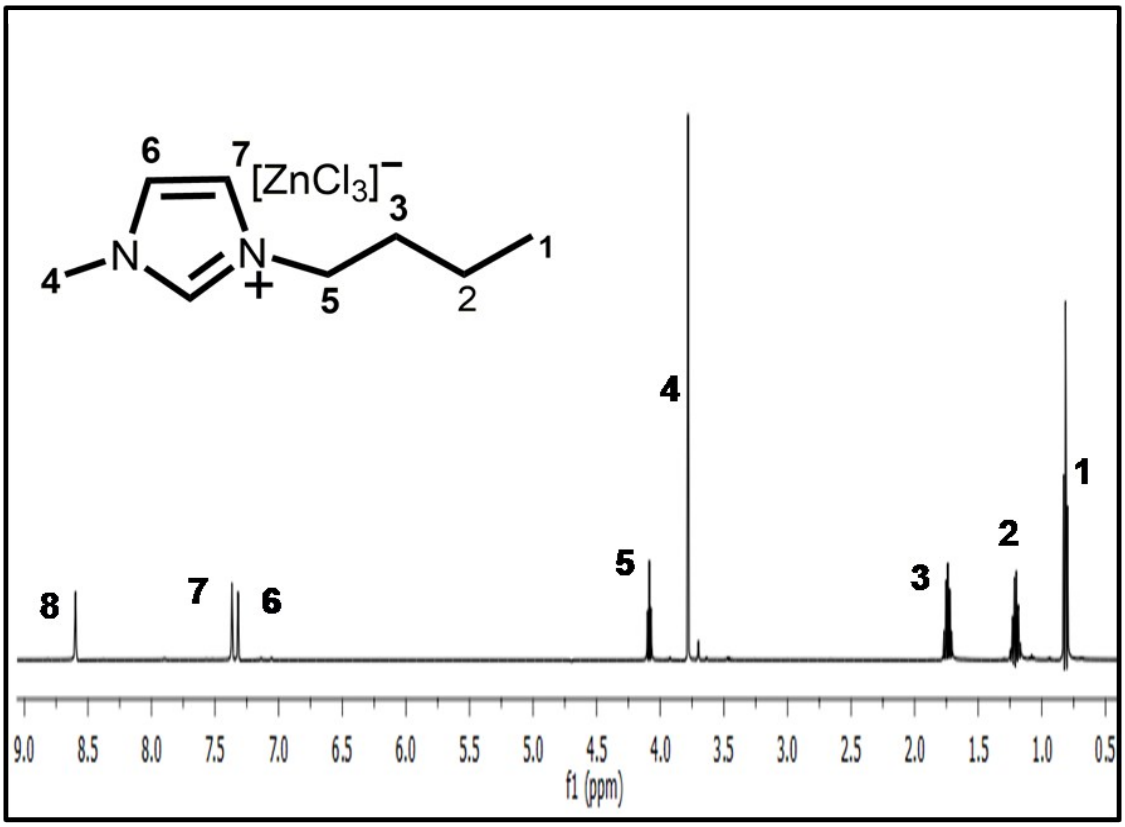

Figure S1: ^{1}H NMR spectra of $[C_4mim][ZnCl_3]$.

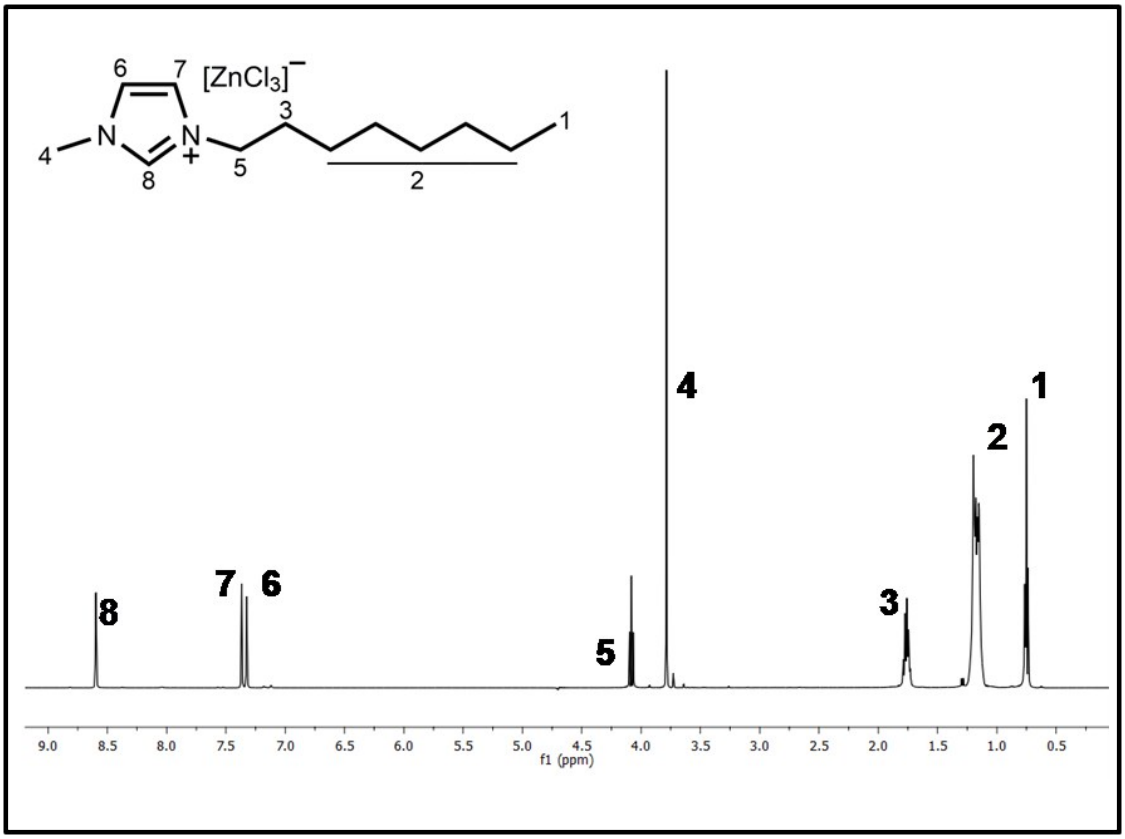

Figure S2: ^{1}H NMR spectra of $[C_8mim][ZnCl_3]$.

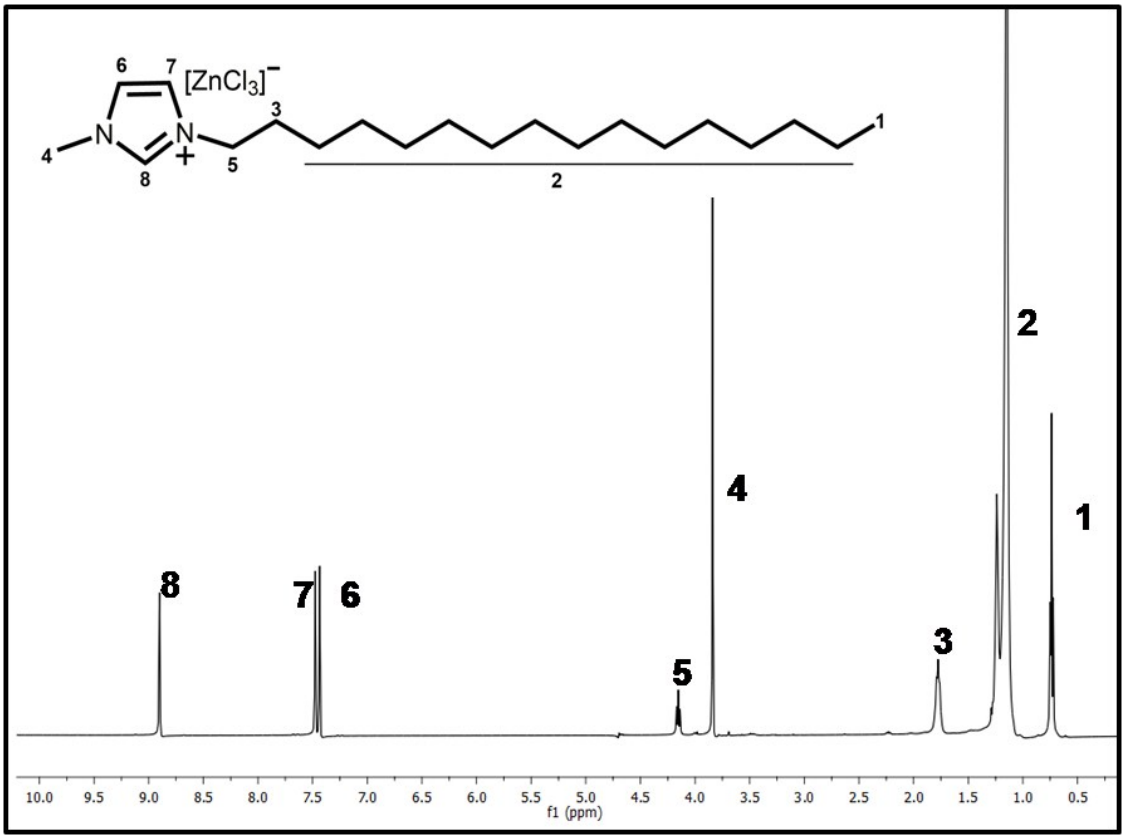

Figure S3: ^{1}H NMR spectra of $[C_{16}mim][ZnCl_3]$.

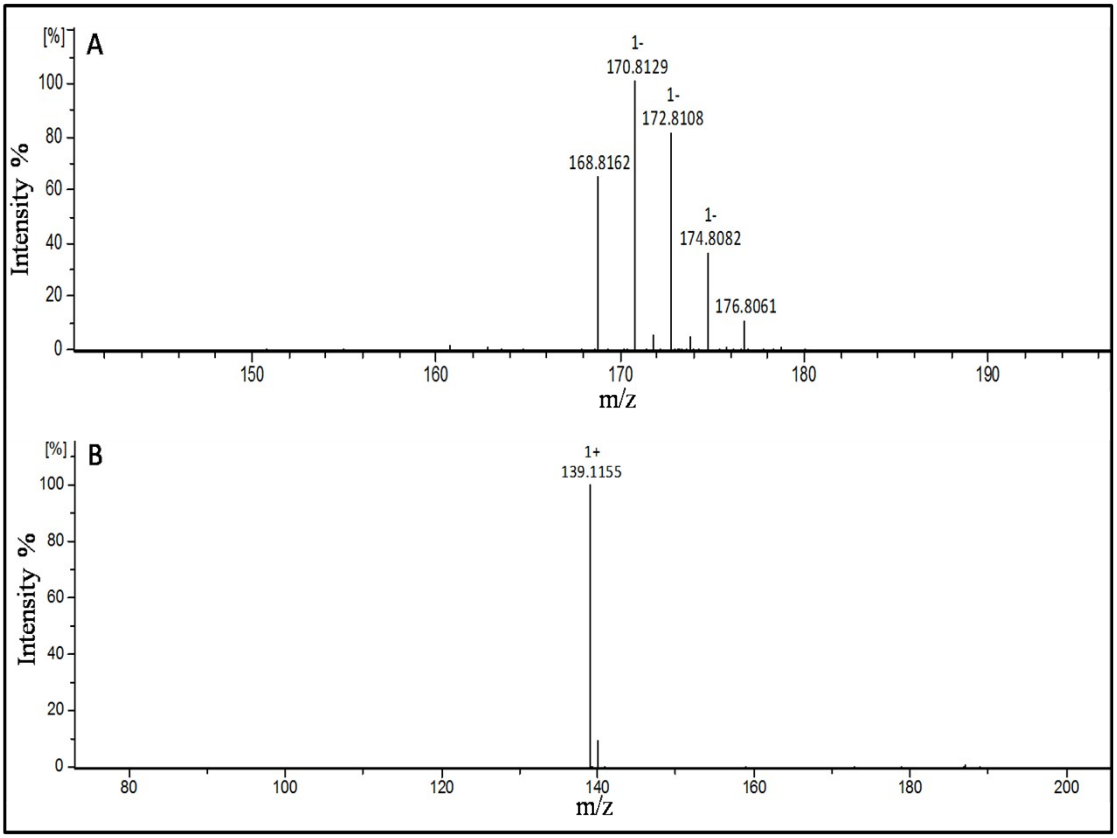

Figure S4: Electrospray ionisation (ESI) mass spectra of (A) anion of $[C_4mim][ZnCl_3]$; and (B) cation of $[C_4mim][ZnCl_3]$.

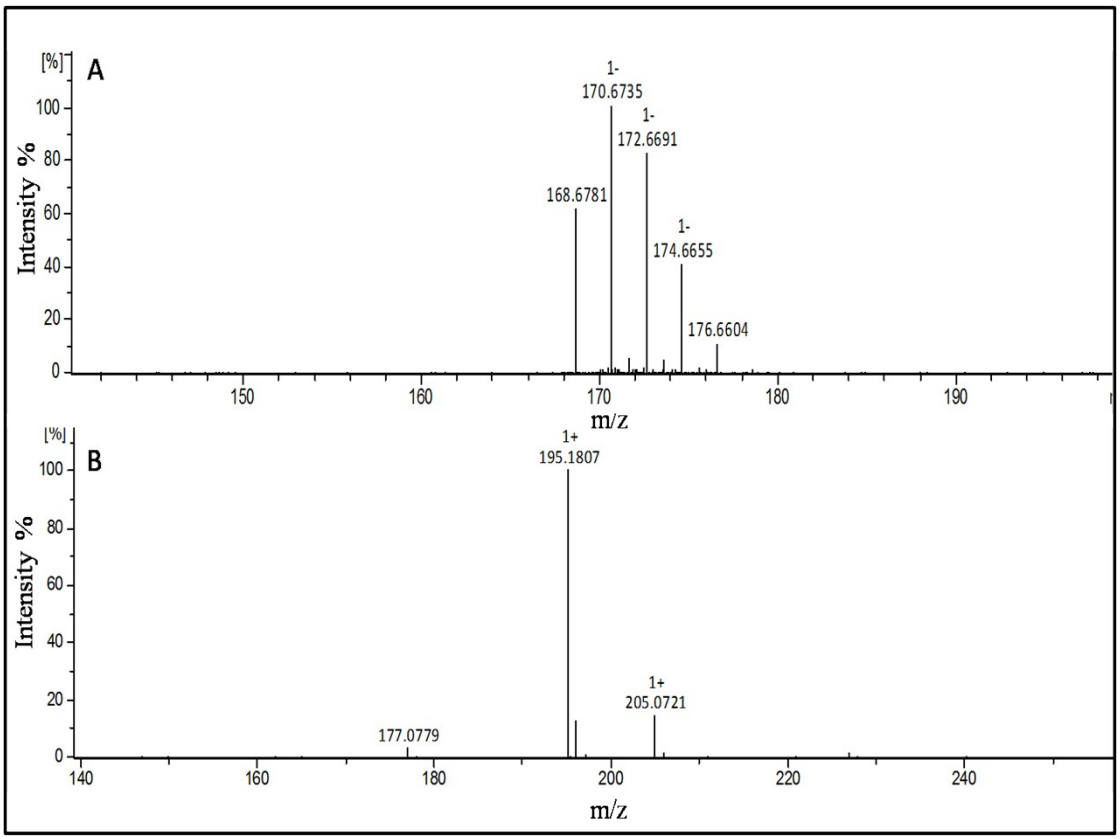

Figure S5: Electrospray ionisation (ESI) mass spectra of (A) anion of $[C_8mim][ZnCl_3]$; and (B) cation of $[C_8mim][ZnCl_3]$.

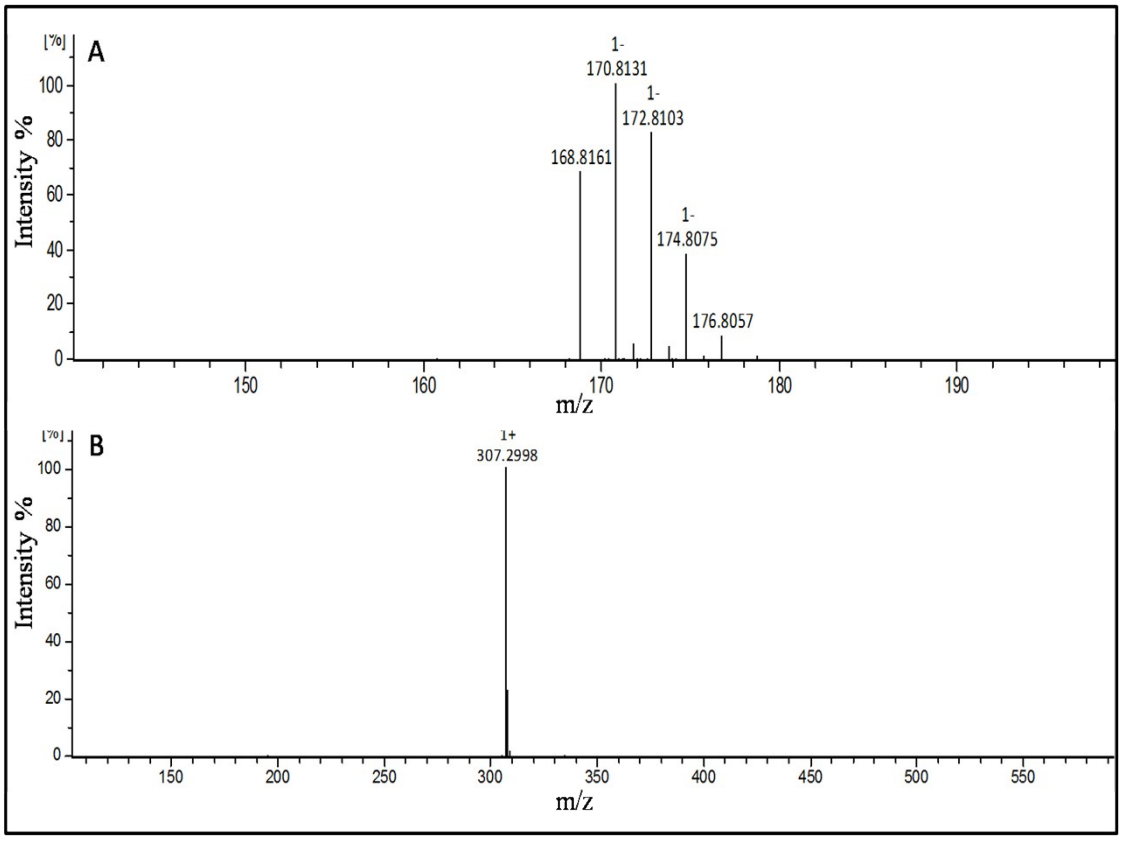

Figure S6: Electrospray ionisation (ESI) mass spectra of (A) anion of $[C_{16}mim][ZnCl_3]$; and (B) cation of $[C_{16}mim][ZnCl_3]$.

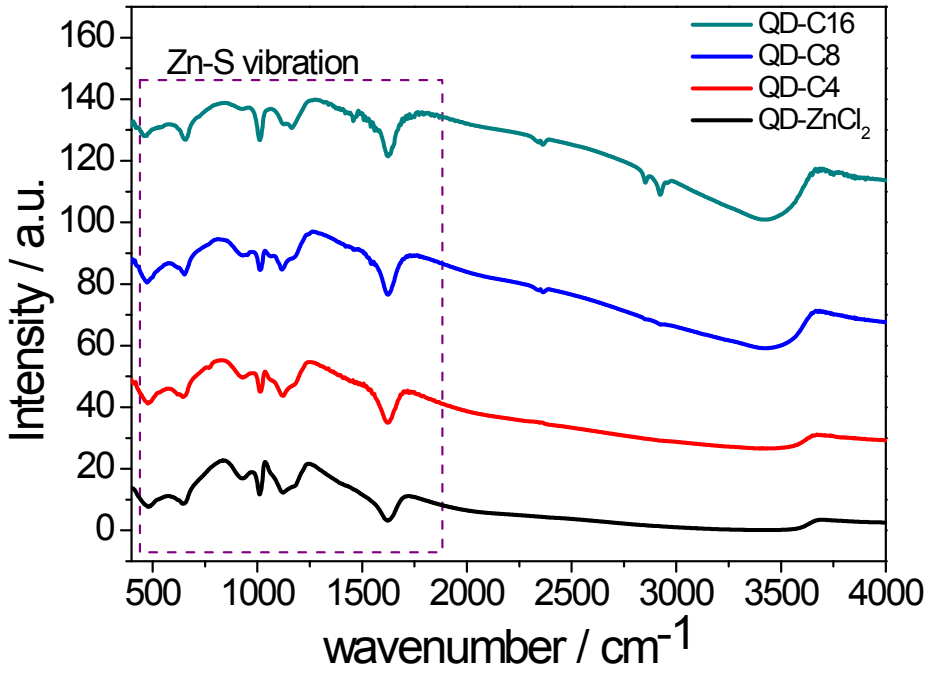

Figure S7: FT-IR spectra of synthesized QDs.

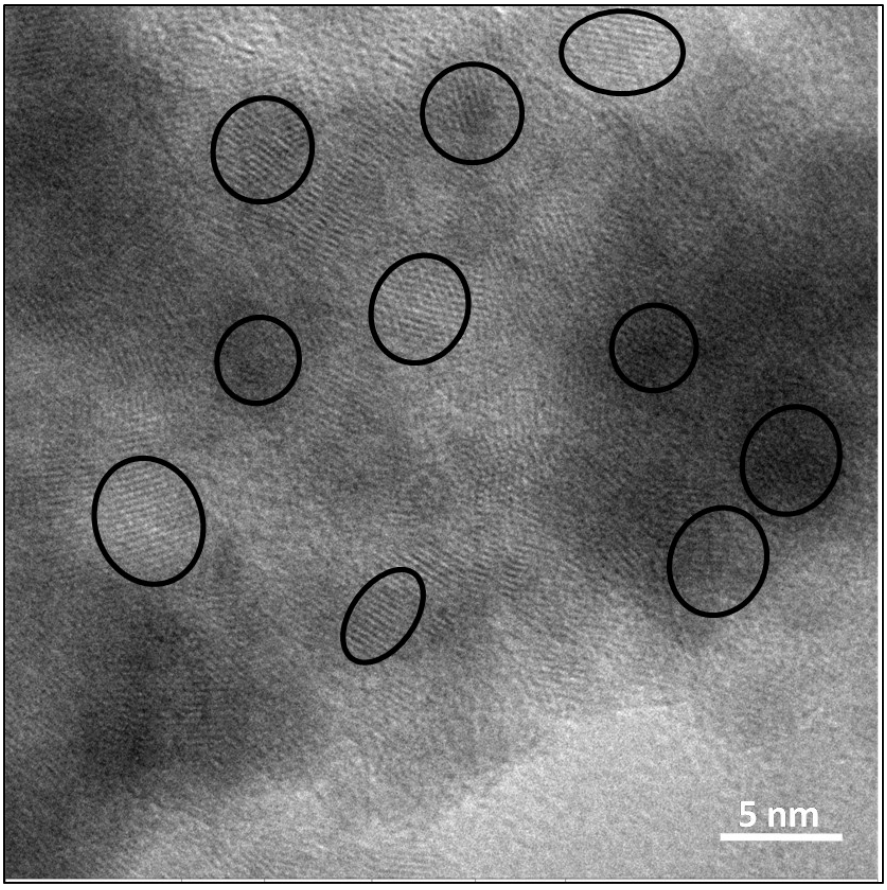

Figure S8: HR-TEM image of QD-$ZnCl_2$.

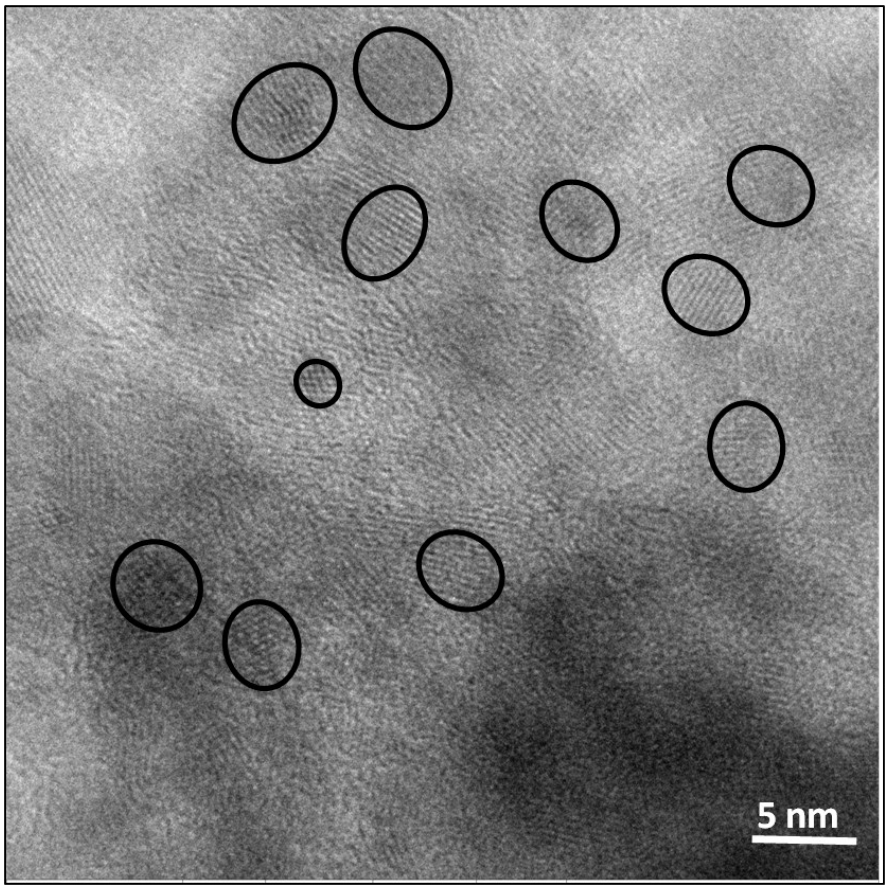

Figure S9: HR-TEM image of QD-C4.

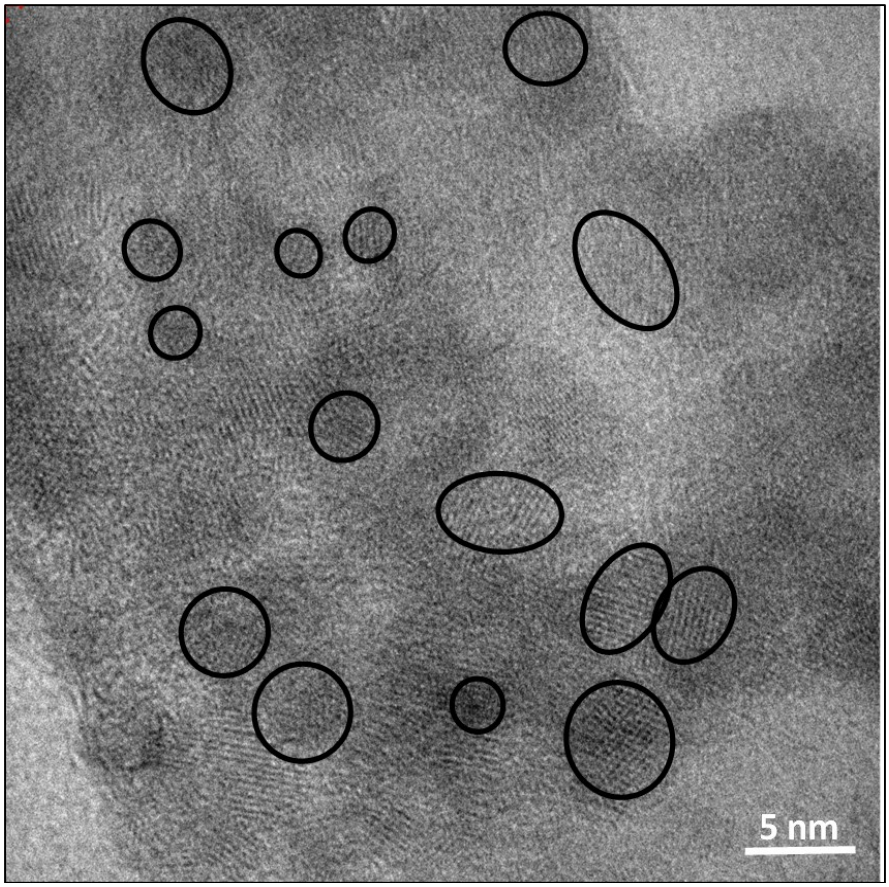

Figure S10: HR-TEM image of QD-C8.

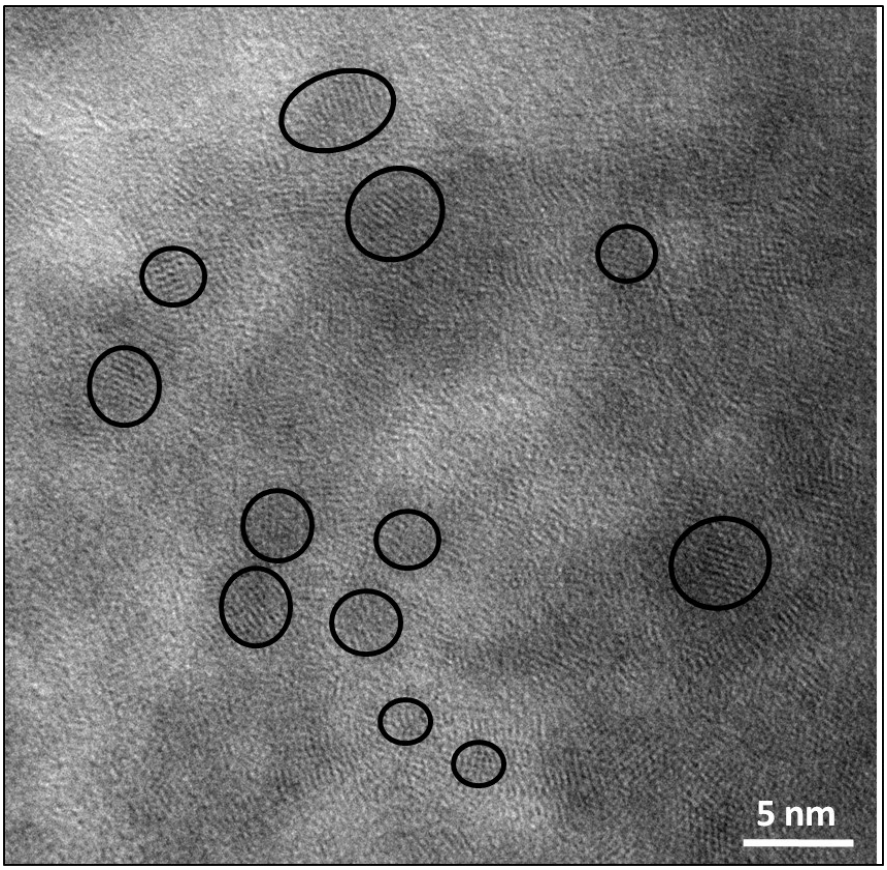

Figure S11: HR-TEM image of QD-C16.