Electronic Supplementary Information

InP/ZnS-Graphene Oxide and Reduced Graphene Oxide Nanocomposites as Fascinating Materials for Potential Optoelectronic Applications †

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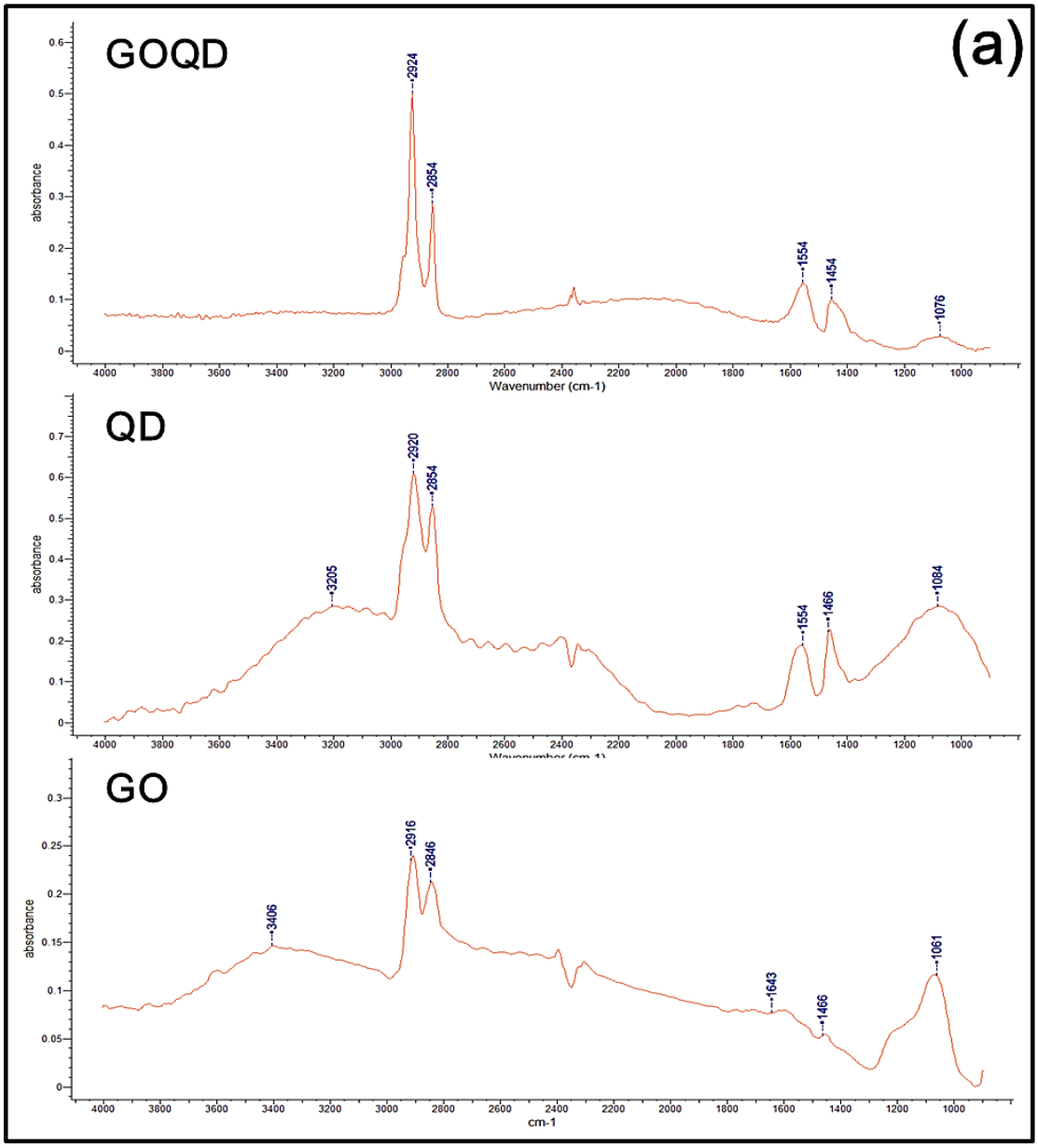

Fig. S1a Micro-FTIR data of GO, QD and GOQD.

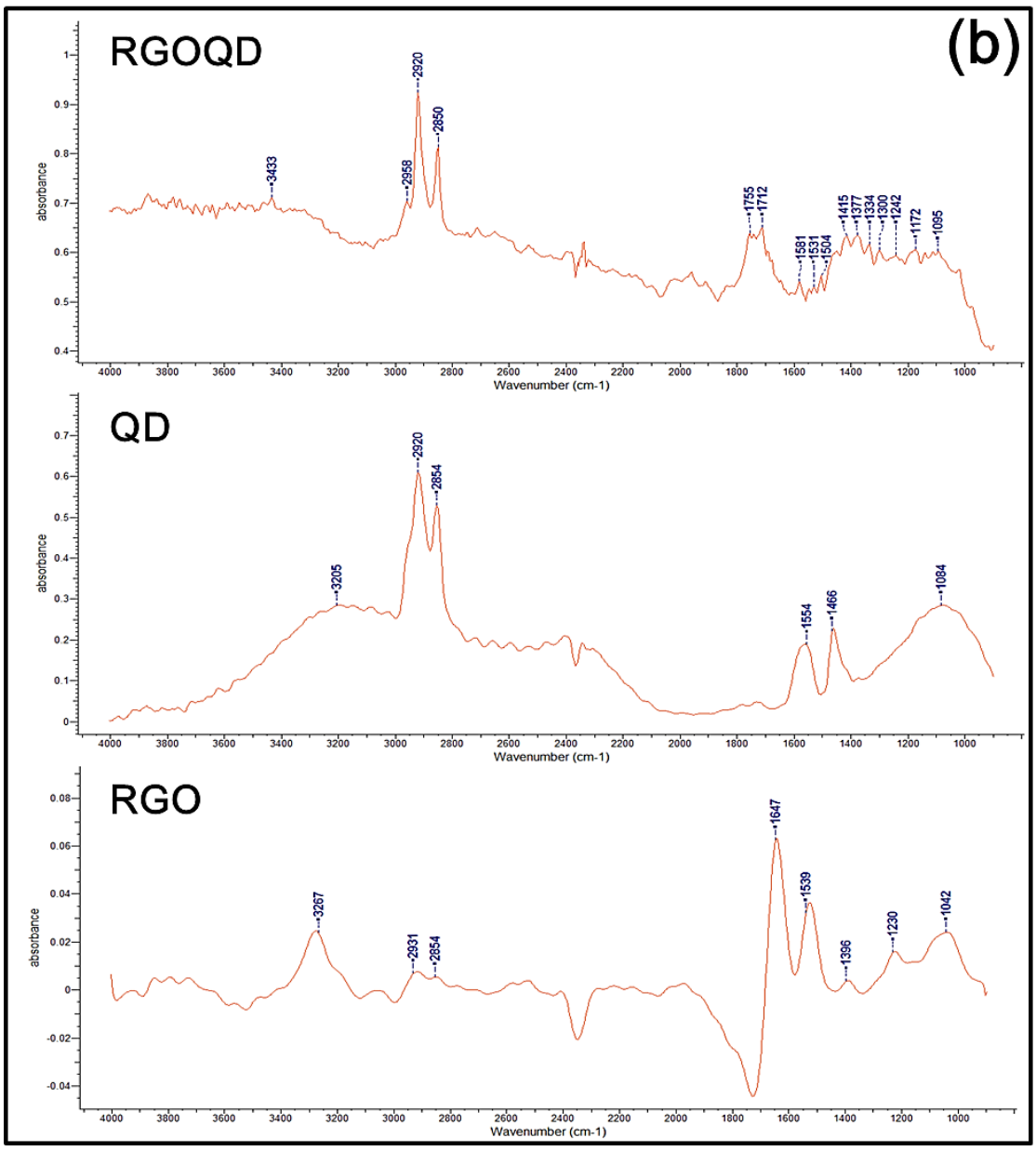

Fig. S1b Micro-FTIR data of RGO, QD and RGOQD.

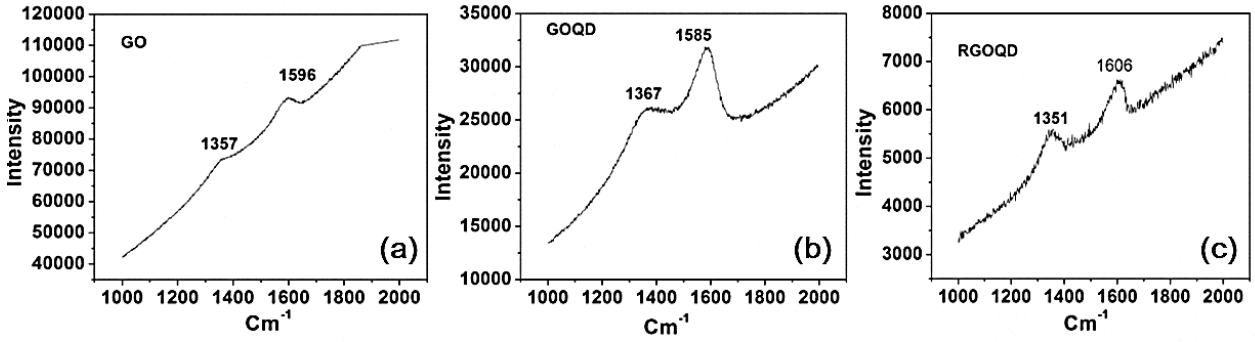

Fig. S2 RAMAN spectra of (a) GO, (b) GOQD and (c) RGOQD.

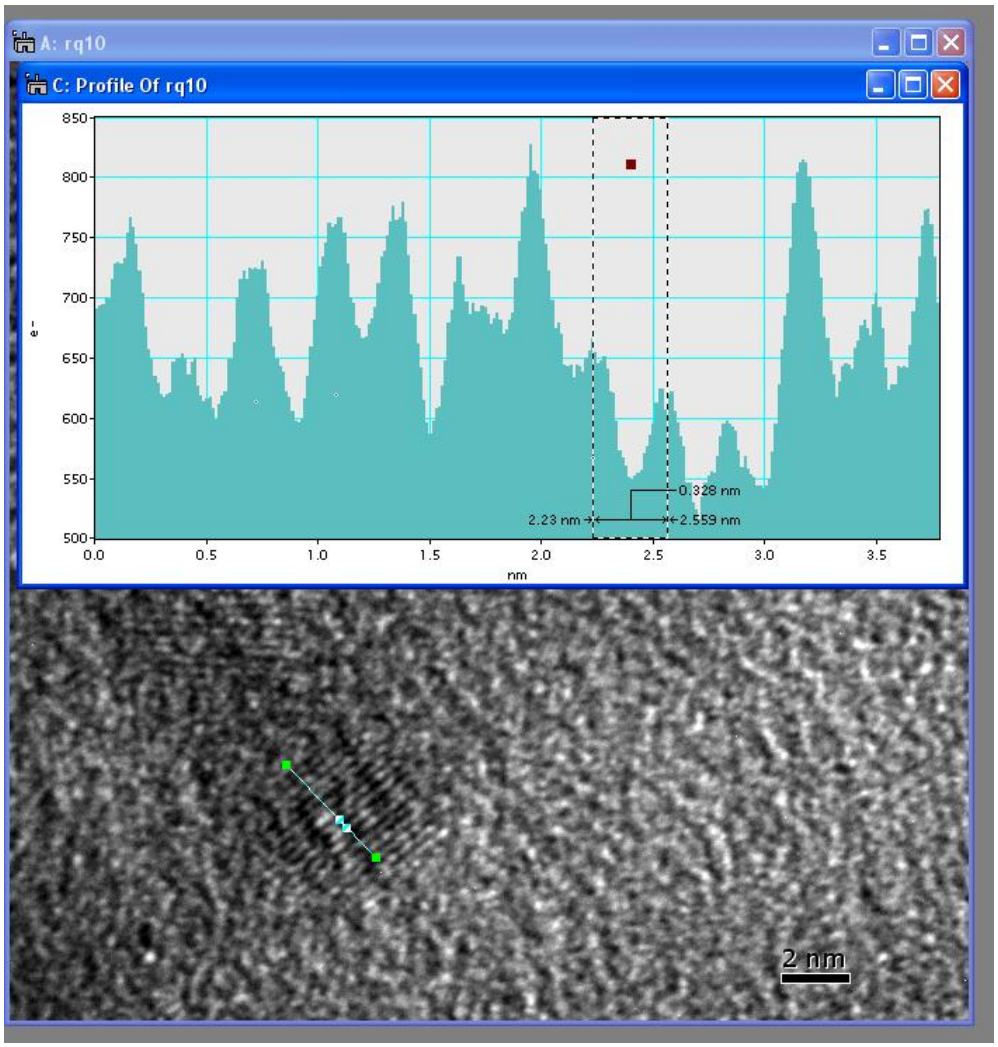

Fig. S3 Lattice separation image of RGOQD.

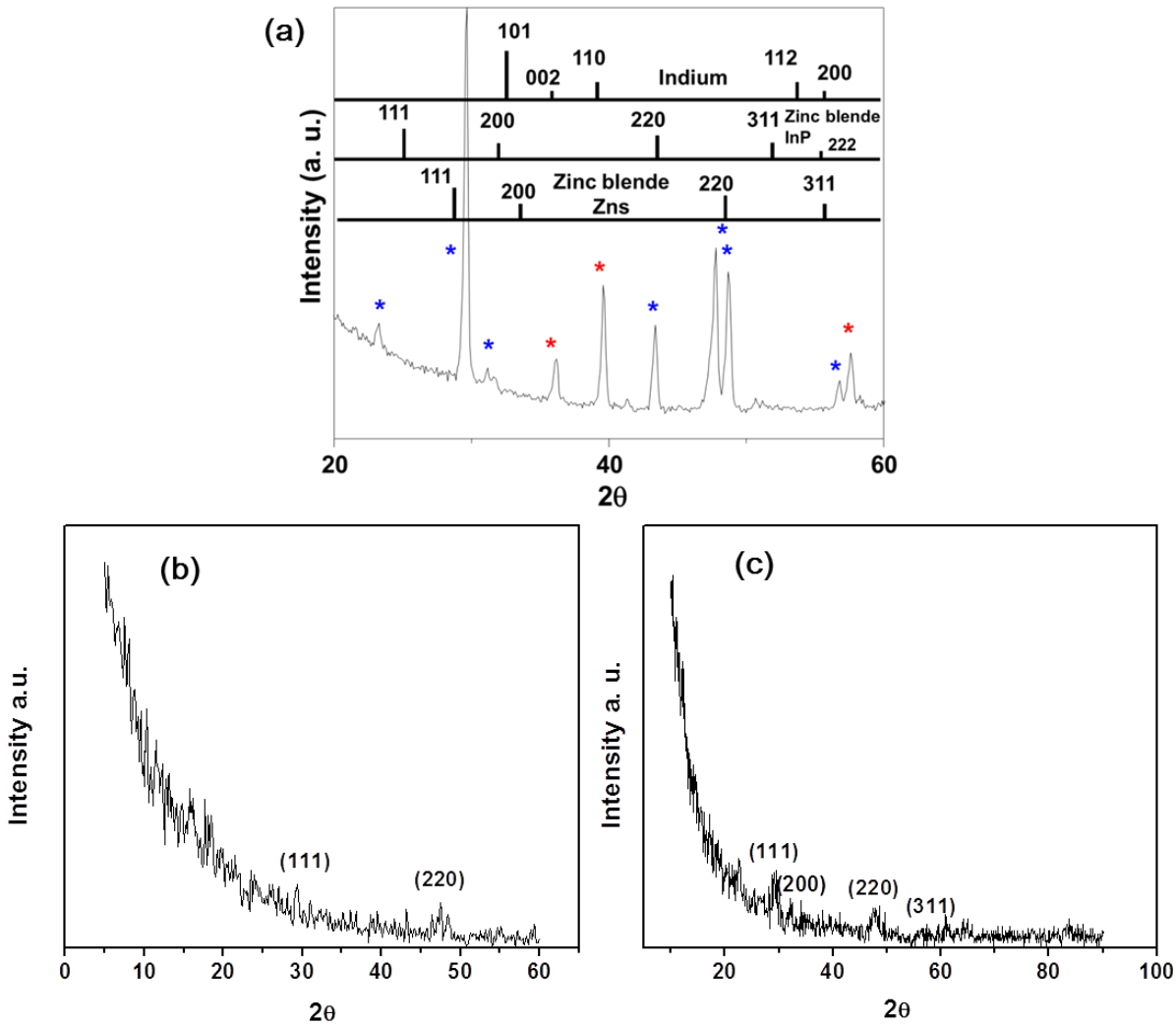

Fig. S4 a) XRD spectra of dried core/shell QD. The blue stars indicate the peaks corresponding to QD and red stars indicate the peaks corresponding to indium, (b) XRD spectra of dried GOQD. The (111) and (220) peaks appear at values of 29.1^{o} and 47.6^{o}, respectively, (c) XRD spectra of dried RGOQD. The (111), (200), (220) and (311) peaks appear at values of 29.1^{o}, 32 ^{o}, 47^{o} and 56.6^{o}, respectively.

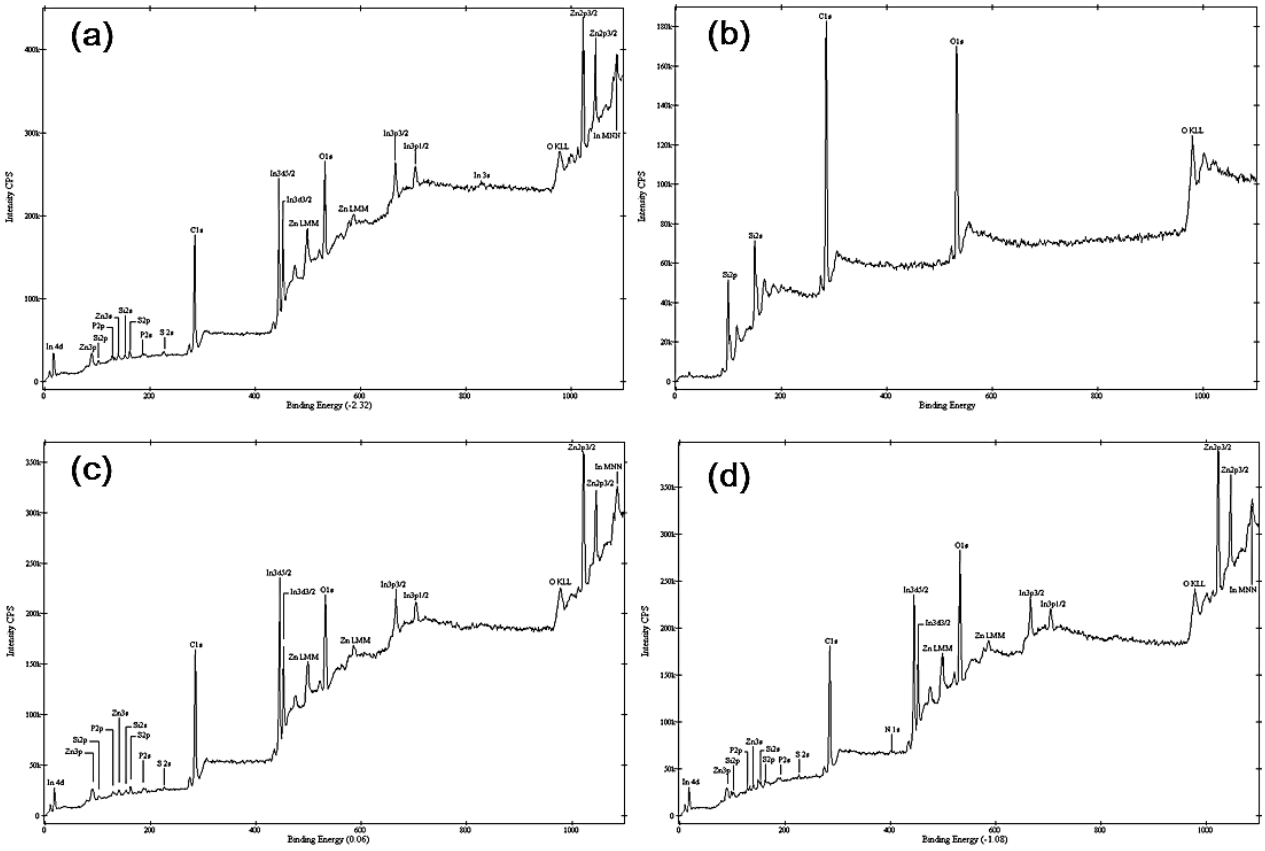

Fig. S5 XPS spectra of (a) QD, (b) RGO, (c) GOQD, and (d) RGOQD.

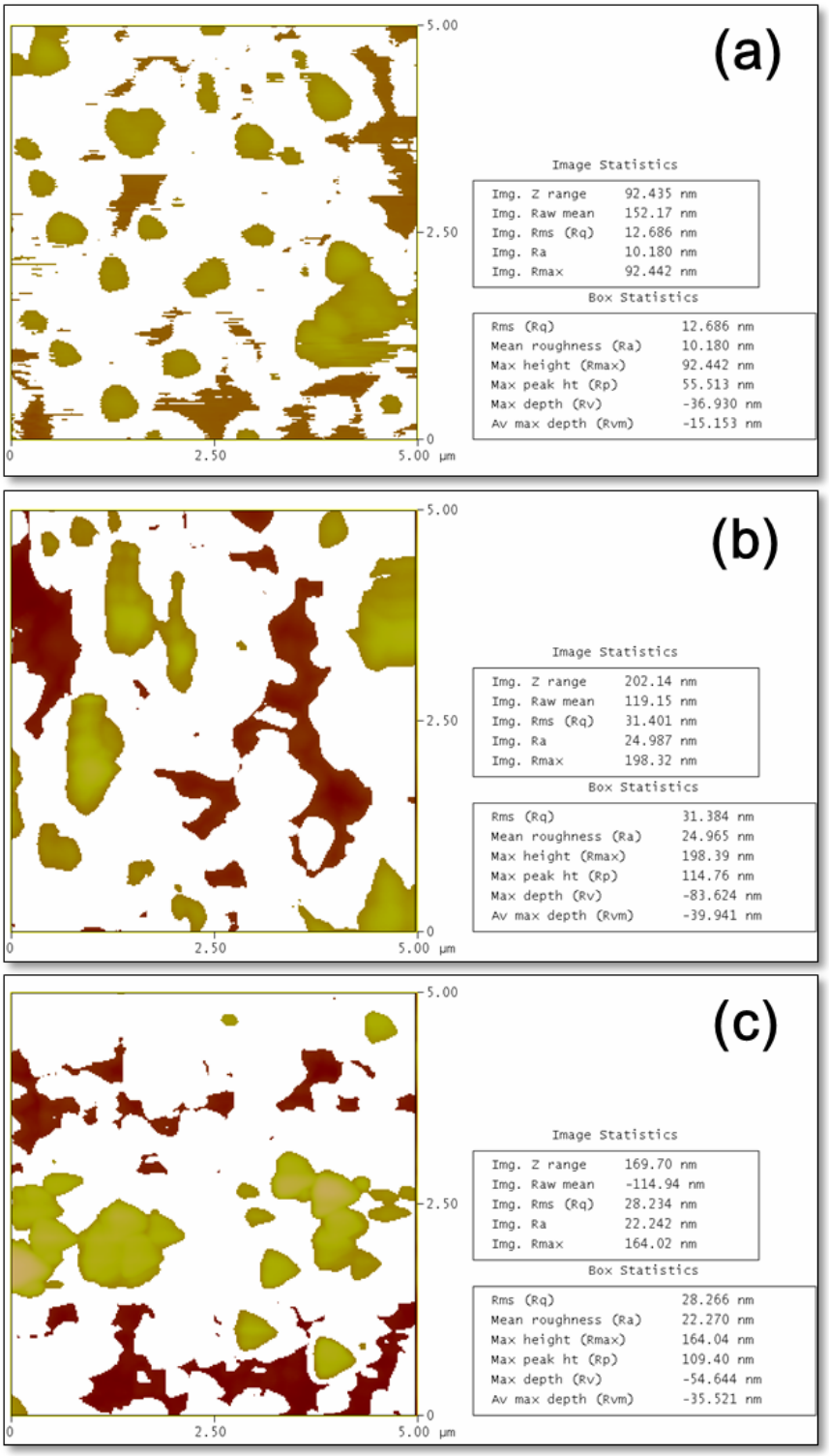

Fig. S6 AFM roughness images of (a) QD, (b) GOQD, and (c) RGOQD.

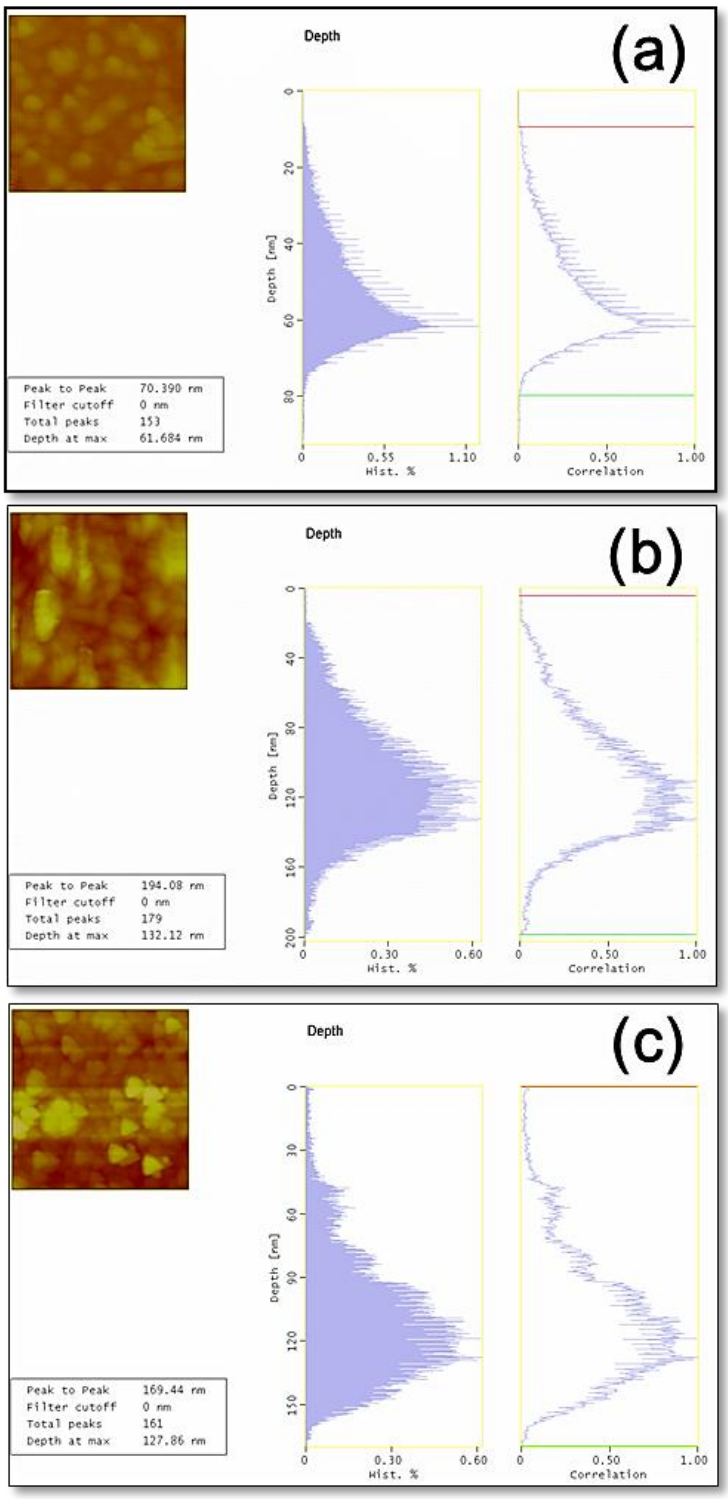

Fig. S7 AFM depth analysis images of (a) QD, (b) GOQD, and (c) RGOQD.

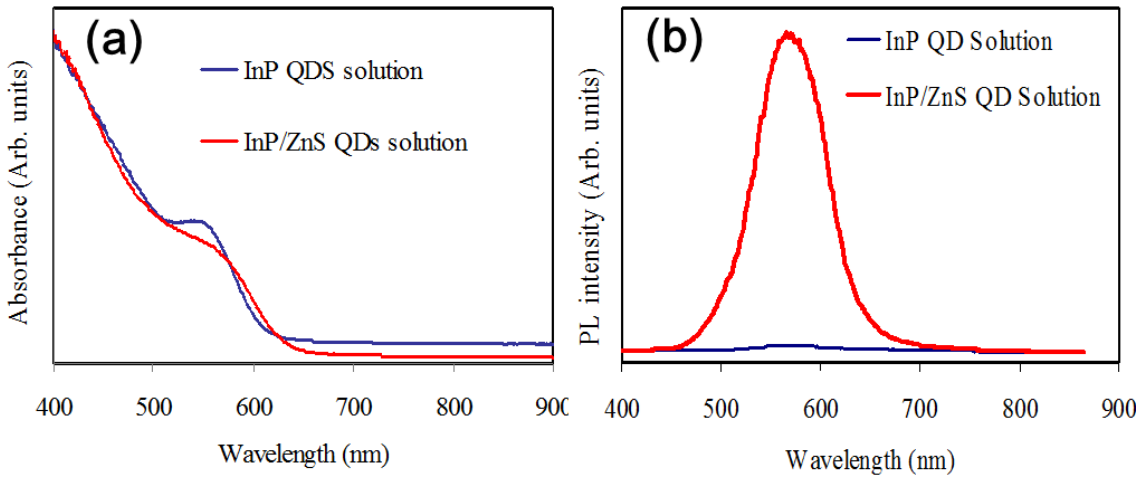

Fig. S8 (a) UV, (b) PL plots of InP and InP/ZnS QD.

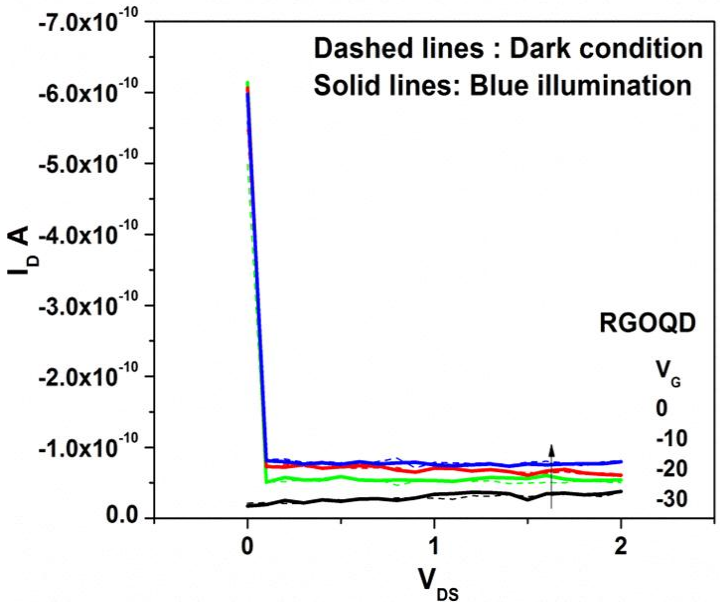

Fig. S9 I_{DS} vs. V_{DS} plot of the MOSFET consisting of GOQD with Y-axis range inverted.

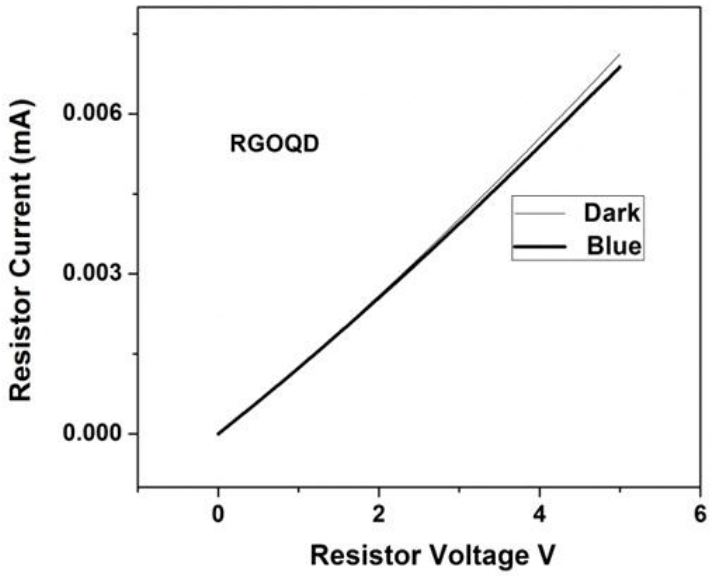

Fig. S10 Resistor current vs. voltage plot of the MOSFET consisting of RGOQD.

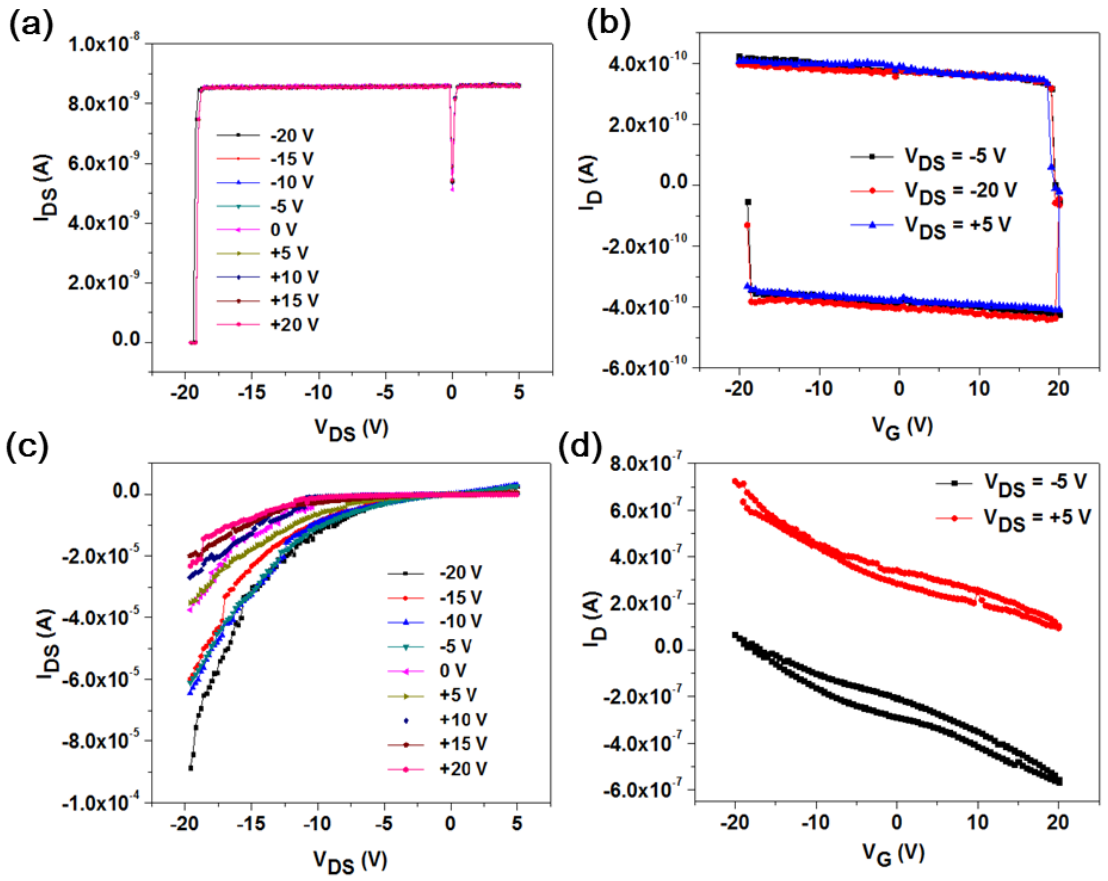

Figure S11. (a) output curves of GO, (b) transfer curves of GO, (c) output curves of RGO, (d) transfer curves of RGO.

Table S1. Elemental ratios and peak positions for the elements found from XPS of QD, GOQD and RGOQD.

Elemental Ratio	QD	GOQD	RGOQD
In:Zn	(32.1/28.756) 1.11	(4.892/3.688) 1.326	(4.882/3.938) 1.239
In:P	(32.1/16.552) 1.94	(4.892/1.723) 2.84	(4.882/1.882) 2.594
In-P-S	(32.1/6.66) 4.82	(4.892/1.186) 4.124	(4.882/2.203) 2.216
Zn-S	(28.756/15.931)1.80	(3.688/1.449) 2.545	(3.938/1.273) 3.09
Peak position	**QD**	**GOQD**	**RGOQD**
In3d5/2	444.46	444.611	444.834
In3d3/2	452.04	452.196	452. 42
Zn3p3/2	1022.15	1022.149	1022.312
Zn3p1/2	1045.20	1045.232	1045.385
S	162.13	161.9	161.9
P (In-P)	128.66	128.6	128.7
P (In-P-S)	132.2	132.8	133.1

Table S2. Data from AFM profiles.

Entry	RMS roughness from dual section analysis[a] nm	Layer height from dual section analysis[b] (nm)	RMS roughness of entire 5 μm^2 films[c] (nm)	Depth and (peak to peak distance)[d] (nm)
QD	16.32	5.23	2.68	61.68 (70.19)
GOQD	37.50	117.67	31.38	132.12 (194.08)
RGOQD	28.48	72.87	28.26	127.86 (169.44)

Data from [a, b] Figure 4, [c] Figure S6, and [d] Figure S7.