Electronic Supplementary Information

Chemical, Structural and Photovoltaic Properties of Graded
CdS$_x$Se$_{1-x}$ Thin Films Grown by Chemical Bath Deposition on
GaAs(100)

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Fig. S1 (a) Cross-sectional BF-TEM image of CdS deposited on GaAs(100) at 70°C for 2 hr. (b) SAED pattern taken from the area marked with a white circle in a, indicating CdS [110] of both WZ and ZB phases ZA parallel to GaAs [110] ZA. (c) Cross-sectional DF-TEM image generated from CdS\textsubscript{WZ} (00.2). (d) Cross-sectional DF-TEM image generated from CdS\textsubscript{ZB} (111). (e) Cross-sectional HR-TEM image taken from the CdS|GaAs(100)
interface; FFT results generated from regions highlighted in white. (f) FFT pattern corresponding to cubic CdS. (g and h) FFT patterns corresponding to hexagonal CdS.

**Fig. S2** (a) Cross-sectional BF-TEM image of Cd(S,Se) deposited on GaAs(100), R_b = 10%, at 70°C for 2 hr. (b) SAED pattern taken from the area marked with a white circle in image (a), indicating Cd(S,Se) [110] ZA parallel to GaAs [110] ZA. (c) Cross-sectional DF-TEM image generated from Cd(S,Se)_{ZB} \((220)\). (d) Cross-sectional DF-TEM image generated from Cd(S,Se)_{WZ} \((00.2)\). (e) Cross-sectional HR-TEM image taken from Cd(S,Se)||GaAs(100) interface; FFT results generated from regions highlighted in white. (f) FFT pattern corresponding to Cd(S,Se)_{ZB}. 
Fig. S3 CdS film thickness as a function of pH. Thickness was obtained from cross-sectional HR-SEM images for CdS films deposited on GaAs(111)B at 70°C for 60 min.
**Fig. S4** Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100) at 70°C for 2 hr with $R_b$ values in the range 0-100%.
**Fig. S5** Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100) at 70°C for 2 hr with $R_b$ values in the range 90-100%.
**Fig. S6** Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100), $R_b=50\%$, growth temperature of 70°C and growth duration of 15 to 180 min.