Electronic Supplementary Information

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

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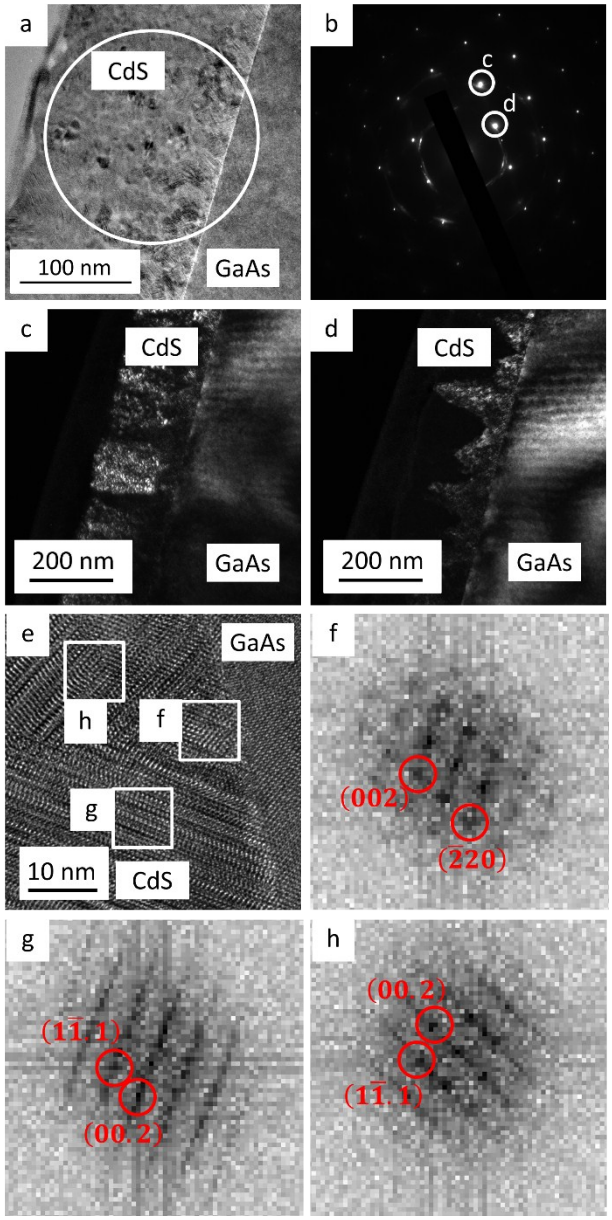

Fig. S1 (a) Cross-sectional BF-TEM image of CdS deposited on GaAs(100) at 70˚C for 2 hr. (b) SAED pattern taken from the area marked with a white circle in a, indicating CdS $[110]$ of both WZ and ZB phases ZA parallel to GaAs $[1\bar{1}0]$ ZA. (c) Cross-sectional DF-TEM image generated from CdS_{WZ} (00.2). (d) Cross-sectional DF-TEM image generated from CdS_{ZB} $(11\bar{1})$. (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.

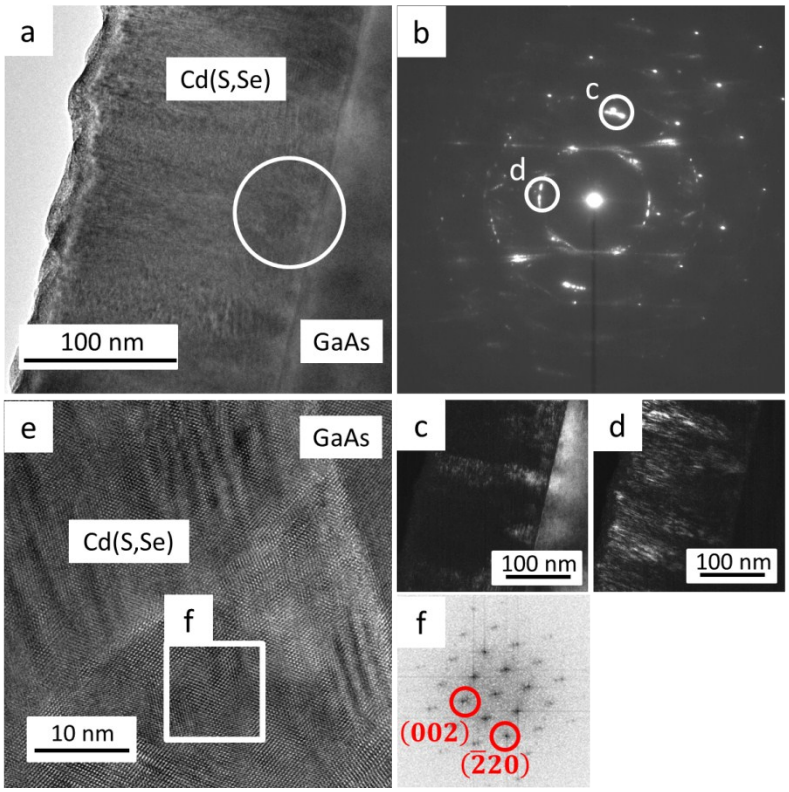

Fig. S2 (a) Cross-sectional BF-TEM image of Cd(S,Se) deposited on GaAs(100), R_b = 10%, at 70˚C for 2 hr. (b) SAED pattern taken from the area marked with a white circle in image (a), indicating Cd(S,Se) [110] ZA parallel to GaAs [110] ZA. (c) Cross-sectional DF-TEM image generated from $Cd(S,Se)_{ZB}$ (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 $Cd(S,Se)_{ZB}$.

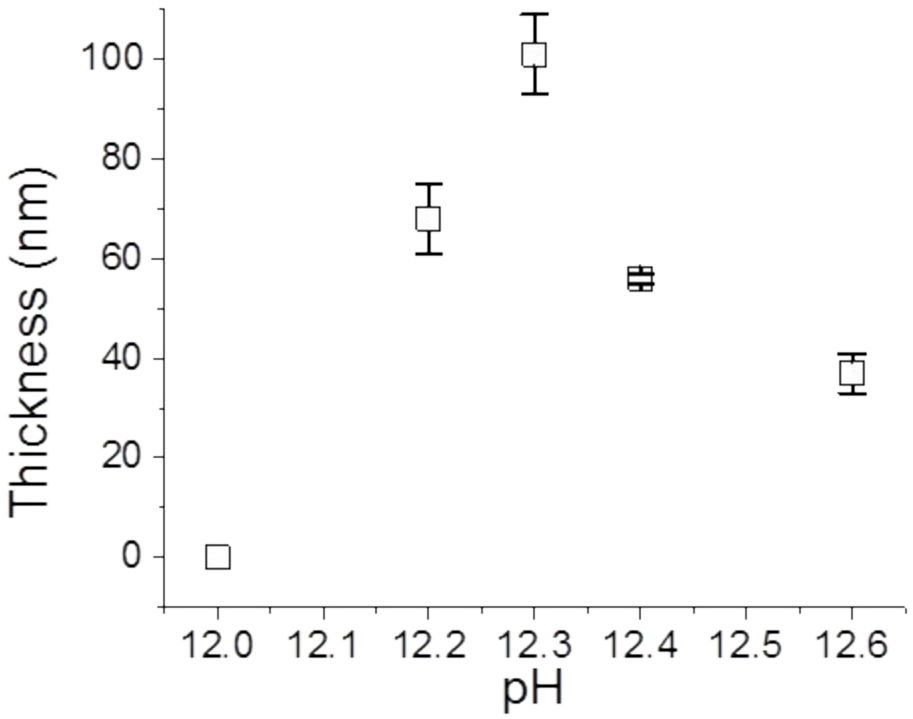

Fig. S3 CdS film thickness as a function of pH. Thickness was obtained from cross-sectional HR-SEM images for CdS films deposited on GaAs(111)B at 70˚C for 60 min.

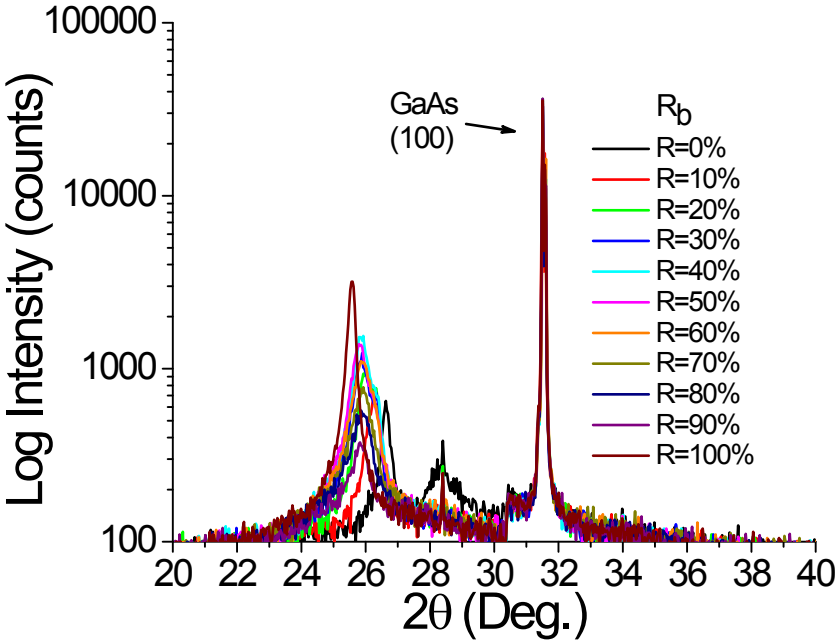

Fig. S4 Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100) at 70℃ for 2 hr with R_b values in the range 0-100%.

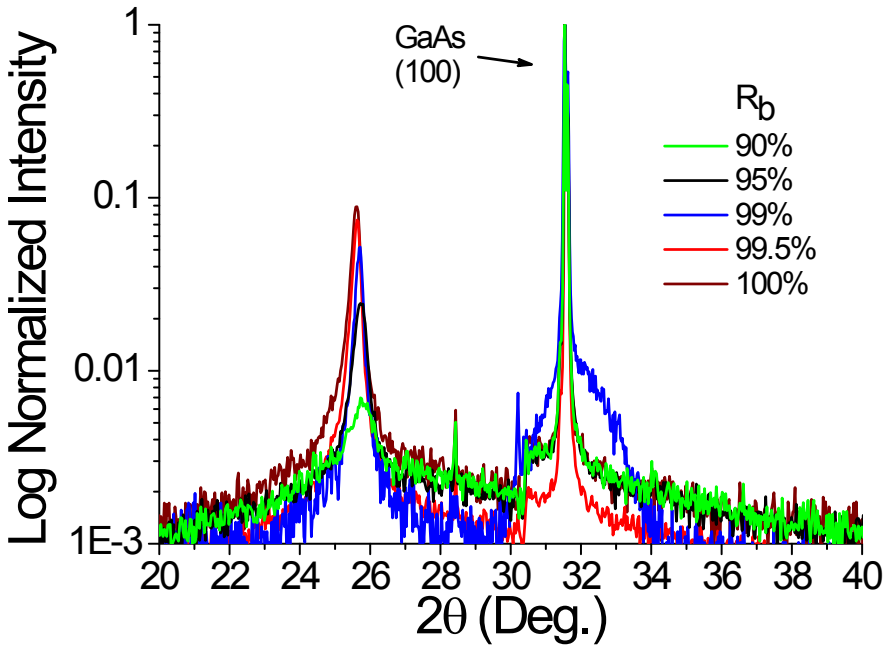

Fig. S5 Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100) at 70℃ for 2 hr with R_b values in the range 90-100%.

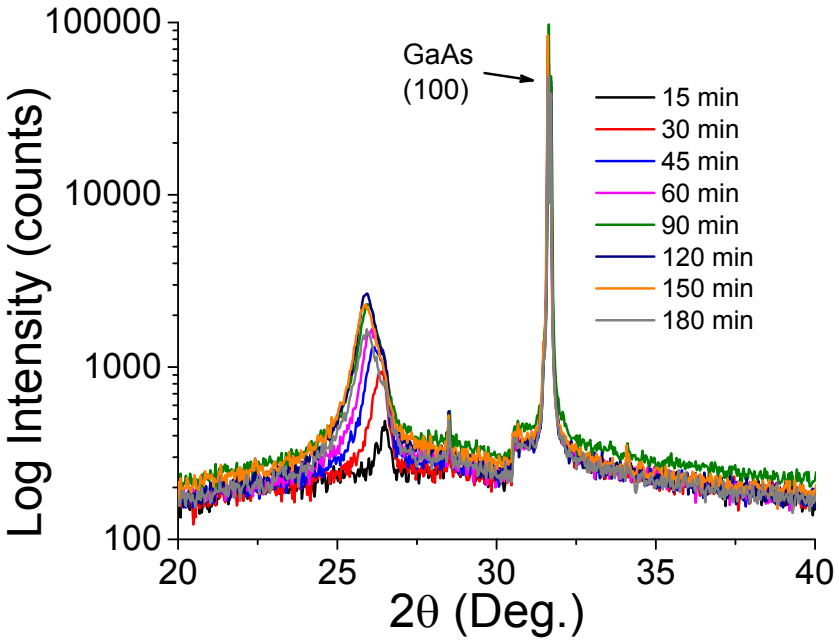

Fig. S6 Wide range X-ray diffractogram of Cd(S,Se) thin films deposited on GaAs(100), R_b=50%, growth temperature of 70℃ and growth duration of 15 to 180 min.