Supporting Information

Liquid flow deposition of PbS films on GaAs(100)

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Transmission electron microscopy (TEM) micrograph showing a cross-section of PbS thin film deposited on GaAs(100) by LFD at 23˚C, growth duration of 30 min, bath pH value of 14 and flow rate of 36ml/min was prepared and analyzed. A cross-sectional bright-field (BF) TEM image of the PbS film and GaAs(100) substrate is presented in Fig. 1a. Selected area electron diffraction (SAED) was obtained (Fig. 1b) from the area marked with a white circle in the BF-TEM image (Fig. 1a). SAED confirms the monocrystalline nature of the film and indicates an orientation relationship of $(011)_{PbS}||(100)_{GaAs}; [0\bar{1}1]_{PbS}||[01\bar{1}]_{GaAs}$. The indexing of the ED is presented in Fig 1c. These results are in agreement with previous reports from our group on PbS films deposited on GaAs(100) by CBD.[9,28]

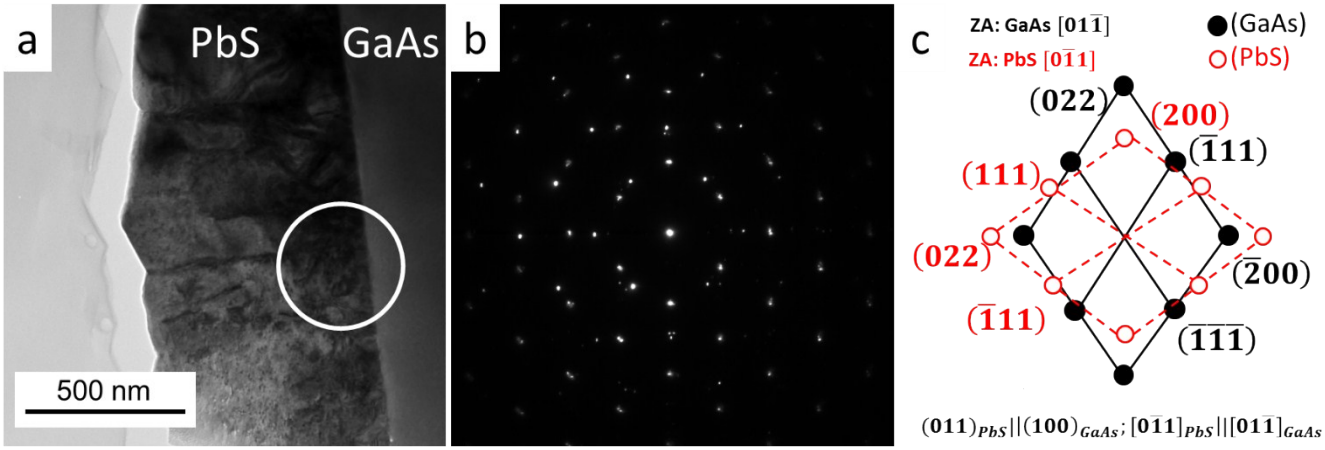

Fig. 1 (a) Cross-sectional bright field TEM image of PbS thin film deposited on GaAs(100) by LFD at 23˚C, growth duration of 30 min, pH of 14 and flow rate of 36ml/min. (b) Selected area transmission electron diffraction pattern taken from the area marked with a white circle in the image, indicating a zone axis (ZA) of $[0\bar{1}1]$ PbS parallel to $[01\bar{1}]$ GaAs. (c) Indexing of the pattern in (b).

Experimental details

Cross sections were prepared by cutting the sample normal to the interface and gluing them together face-to-face using M-Bond 610 adhesive (Allied HighTech Ltd.). The samples were polished to a nominal thickness of 30μm with a precision tripod holder on a series of diamond polishing papers (Allied HighTech Ltd.), and glued to a Mo slot grid (1×2 mm^2). Final thinning was carried out using a Gatan PIPS-2 precision ion polishing system. TEM imaging and electron diffraction were performed using a JEOL JEM-2100F instrument operating at 200kV.

References

9. A. Osherov, V. Ezersky and Y. Golan, *J. Cryst. Growth*, 2007, **308**, 334–339.

28. A. Osherov, M. Shandalov, V. Ezersky and Y. Golan, *J. Cryst. Growth*, 2007, **304**, 169–178.