Supporting Information

Embedded high-quality ternary GaAs$_{1-x}$Sb$_x$ quantum dots in GaAs nanowires by molecular-beam epitaxy

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Fig. S1. (a) HAADF-STEM image of the GaAs nanowire with an embedded GaAs$_{0.8}$Sb$_{0.2}$ quantum dot (Sb supply time is 12 s); (b) HAADF-STEM image and EDS line scan taken from the red rectangular region in panel (a).

Fig. S2. (a) HAADF-STEM image of the GaAs nanowire with an embedded GaAs$_{0.85}$Sb$_{0.15}$ quantum dot (Sb supply time is 20 s); (b) HAADF-STEM image and EDS line scan taken from the red rectangular region in panel (a).

Fig. S3. (a) TEM image of the GaAs nanowire; (b) HRTEM image taken from the red rectangular region in panel (a); (c) The corresponding FFT image of panel (b).
Fig. S4. (a) TEM image of an embedded GaAs$_{0.64}$Sb$_{0.36}$ quantum dot grown at 570 °C. The rectangles in Fig. S4(a) highlight the regions where the HRTEM images were recorded; (b) HAADF-STEM image and the corresponding EDS line scan; (c)-(e) False color EDS maps of the GaAs$_{0.64}$Sb$_{0.36}$ quantum dot; (f) HRTEM image of the bottom GaAs (blue rectangular in panel (a)); (g) The corresponding FFT image of panel (f); (h) HRTEM image of the GaAs/GaAs$_{0.64}$Sb$_{0.36}$/GaAs (red rectangular in panel (a)); (i) HRTEM image of the GaAs$_{0.64}$Sb$_{0.36}$ quantum dot (green rectangular in panel (a)); (j) The corresponding FFT image of panel (i); (k) HRTEM image of the upper GaAs (orange rectangular in panel (a)); (l) The corresponding FFT image of panel (k); Compared to the panel (a), panel (f), (h), (i) and (k) were rotated 90 degrees.
Fig. S5. (a) TEM image of an embedded GaAs\textsubscript{0.63}Sb\textsubscript{0.37} quantum dot covered with a spontaneous GaAs passivation layer grown at 510 °C. The rectangles in Fig. S5(a) highlight the regions where the HRTEM images were recorded; (b) HAADF-STEM image and the corresponding EDS line scan; (c)-(e) False color EDS maps of the GaAs\textsubscript{0.63}Sb\textsubscript{0.37} quantum dot; (f) HRTEM image of the bottom GaAs (blue rectangular in panel (a)); (g) The corresponding FFT image of panel (f); (h) and (i) HRTEM images of the GaAs/GaAs\textsubscript{0.63}Sb\textsubscript{0.37}/GaAs (red rectangular in panel (a)); (j) HRTEM image of the upper GaAs (orange rectangular in panel (a)); (k) The corresponding FFT image of panel (j); Compared to the panel (a), panel (f), (h), (i) and (k) were rotated 90 degrees.
Fig. S6. (a) Cross-section TEM image of an embedded Ga\textsubscript{0.63}Sb\textsubscript{0.37} quantum dot covered with a spontaneous GaAs passivation layer grown at 510 °C; (b) HRTEM image taken from the red rectangular region in panel (a); (c) The corresponding FFT image of the blue rectangular region in panel (b); (d)-(f) False color EDS maps of the Ga\textsubscript{0.63}Sb\textsubscript{0.37} quantum dot.