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【171】 Growth of Crystal Phase Engineered Planar Films of III-V Semiconductors

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Crystal phase engineering in semiconductors has attracted considerable interest because of its potential applications in solid state lighting and group IV emitters. However, synthesizing materials in their thermodynamically less stable phase is challenging and so far, has mainly been realized in nanowires. Here, we present a general approach to controllably integrate both zinc-blende (ZB) and wurtzite (WZ) phases of III-V semiconductors in a catalyst-free epitaxy yielding large area substrates with exceptionally high material quality. We conduct comprehensive material analysis including HRTEM, PL and CL characterization and find phase purities of 100% and 97% for ZB and WZ InP, respectively.

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