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Growth and optical properties of highly oriented ZnSSe alloy nanowires[1] SUI KONG HARK, YAO LIANG, The Chinese University of Hong Kong — ZnS, ZnSe and their alloys are important semiconductors for optical applications in the UV-blue spectral region. Nanowires, nanobelts and nanotubes of ZnS and ZnSe, but rarely their alloys, had been synthesized, typically as a random, inhomogeneous assembly. For future basic studies and applications, it is necessary to control the orientation and composition of the nanowires. We have grown ZnSSe alloy nanowires epitaxially on GaAs substrates by metal-organic chemical vapor deposition. Their orientation was adjusted by changing the crystallographic orientation of the substrate. Through controlled alloying, we have also achieved band gap engineering. The nanowires were characterized by SEM, HRTEM and XRD. Their optical properties were studied by Raman, cathodoluminescence and photoluminescence spectroscopy. In addition to the nanowires, the growth conditions and optical properties of ZnSSe alloy nano-tetrapods were studied.

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