

Polyol -synthesis of silver nanowires with high aspect ratio

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Shape and morphology controlled silver nanocrystals such as spheres, cubes, prisms, rods, and wires have been of great interest because of their potential in uses as LSPR (Localized Surface Plasmon Raman) sensors, SERS (surface enhanced Raman scattering) sensors, catalysts, electrodes, and energy devices. Among the silver nanocrystals, silver nanowires is becoming the next generation materials for flexible electronics owing to high electrical conductivity, high numerical aperture by low percolation threshold, ductility, and flexibility. Generally, the multiply twinned silver nanocrystals exposing many {111} facets are produced without reaction control because the surface energy of faced centered cubic silver nanocrystals is in the order of $\{111\} < \{100\} < \{110\}$ facet. Therefore, to promote the formation of silver nanowires, we create the decahedral twin seed particles preferentially and grow the seeds anisotropically by blocking {100} facets of silver nanowires. Here, we systematically studied the effect of experiment parameters to yield highly anisotropic silver nanowires.