

Study of one dimensional silver nanobelt

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Abstract

In this study, We use cetyltrimethylammonium chloride (CTAC) as the growth control agent to fabricate the one dimensional silver nanobelt via galvanic displacement reaction on TEM copper grid. The silver nanobelt with a thickness less than 10 nm, a width 30 ~ 100 nm, a length up to 10 μm , was prepared by reacting $\text{AgNO}_{3(\text{aq})}$ and $\text{Cu}_{(\text{s})}$ in an aqueous solution of CTAC. In this experiment, the silver nanobelt depends on a critical combination of many factors in the environments. The most important one is stand time, and 15 minutes is the best. Other factors such as formations of the carbon film, copper source, and reaction temperature also play a significant role to effect the yield. Besides, we found that the silver nanobelt is a novel single crystalline hexagonal 4H structure. Because Silver is the best conductance in metal and nanobelt structures have the high surface area, we hope their potential use as interconnects in the future nanoelectronics and application for nanosensors.