

## Fabrication of branched Ga<sub>2</sub>O<sub>3</sub> nanowires by post annealing with Au seeds

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Gallium Oxide (Ga<sub>2</sub>O<sub>3</sub>) has been widely investigated for the optoelectronic applications due to its wide bandgap and the optical transparency. Recently, with the development of fabrication techniques in nanometer scale semiconductor materials, there have been an increasing number of extensive reports on the synthesis and characterization of Ga<sub>2</sub>O<sub>3</sub> nano-structures such as nano-wires, nano-belts, and nano-dots. In contrast to typical vapor-liquid-solid growth mode with metal catalysts to synthesis 1-dimensional nano-wires, there are several difficulties in fabricating the nano-structures by using sputtering techniques. This is attributed to the fact that relatively low growth temperatures and higher growth rate compared with chemical vapor deposition method.

In this study, Ga<sub>2</sub>O<sub>3</sub> nanowires (NWs) were synthesized by using radio-frequency magnetron sputtering method. The NWs were then coated by Au thin films and annealed under Ar or N<sub>2</sub> gas environment with no supply of Gallium and Oxygen source. Several samples were prepared with varying the post annealing parameters such as gas environment annealing time, annealing temperature. Samples were characterized by using XRD, SEM, and PL measurements. In this presentation, the details of fabrication process and physical properties of branched Ga<sub>2</sub>O<sub>3</sub> NWs will be reported.

**Keywords:** Ga<sub>2</sub>O<sub>3</sub>, Nanowires, Branched structure, Annealing