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Fabrication of Etched Graphene/CuO Nanowires as Field Effect Transistors

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Field effect transistor based on semiconductor nanowires has been attracting lots of concerns and studies of scientists because of its different characteristic comparing with other morphology like thin film. Nowadays, graphene is introducing a great promise as an active layer in field effect transistor due to its unique electronic and optoelectronic properties. Thus, a mix structure between etched graphene and semiconductor nanowires is believed to expose novel electrical characteristics. In this study, CuO nanowires (20~80 nm in diameter and 1~10 μm length) were grown during oxidizing Cu foil at 450°C for 24 h. Besides, 3-layers etched graphene was deposited on Cu foil at 1,000°C using a feedstock of CH₄/H₂ mixed gas in CVD system. A structure of Ni/Au electrode + CuO nanowires + etched graphene was fabricated, afterward. Finally, field effect properties of the device was revealed and compared with individual devices of just nanowires and just graphene.

Keywords: CuO nanowires, Graphene, Field effect transistors

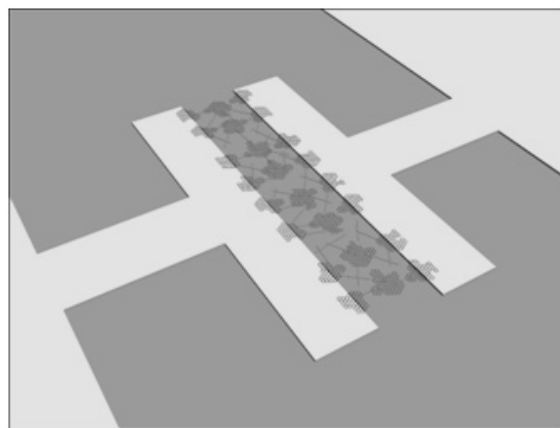


Fig. 1. Structure of etched graphene/CuO nanowires device.