

Technology development for nano structure formation: Fabrication and characterization

Abstract

The paper contains a report on a technology development for nano structure formation using standard CMOS process-based method capable of fabricating precisely control nano wire and nanogap. The fabrication of nanoscale patterns with dimensions of 50 nm or less has been the goal of many researchers for potential applications as sensors, using Electron beam lithography and step wise patterning and oxidation was introduced for size expansion and trimming nanogap and Nanowire fabrication from micro sizes down to nano sizes < 30 nm. To demonstrate the quality of the fabricated nanogap, the fabricated structure is optically and electrically characterized with a field emission scanning electron microscope (FESEM) and dielectric analyzer (DA). To characterize the fabricated nanogap, an electrical characterization of the structures by dielectric analyzer (DA) shows an enhanced permittivity and capacity with the reduction of gap size, and Nano wire of lowest dimension of 1.5 nm was obtained with improved conductivity, suggesting the potential of the fabricated devices for applications in sensitive and selective detection of biomolecules with very low level of power supply.

Keywords

Dielectric analyzer; E-beam lithography fabrication; FESEM; Nano structure