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## Fabrication and Characterization of Cr-Si Schottky Nanodiodes Utilizing AAO Templates

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We have fabricated Cr nanodot Schottky diodes utilizing AAO templates formed on n-Si substrates. Three different sizes of Cr nanodots (about 75.0, 57.6, and 35.8 nm) were obtained by controlling the height of the AAO template. Cr nanodot Schottky diodes showed a rectifying behavior with low SBHs of 0.17~0.20 eV and high ideality factors of 5.6~9.2 compared to those for the bulk diode. Also, Cr nanodot Schottky diodes with smaller diameters yield higher current densities than those with larger diameters. These electrical behaviors can be explained by both Schottky barrier height (SBH) lowering effects and enhanced tunneling current due to the nanoscale size of the Schottky contact. Also, we have fabricated Cr-Si nanorod Schottky diodes with three different lengths (130, 220, and 330 nm) by dry etching of n-Si substrate. Cr-Si nanorod Schottky diodes with longer nanorods yield higher reverse current than those with shorter nanorods due to the enhanced electric field, which is attributed to a high aspect ratio of Si nanorod.

**Keywords:** Schottky nanodiode, Cr nanodot, Si nanorod, SPM

