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Localized electrical properties of individually charged silicon nanocrystals embedded in a SiO2 layer J. M. SON, E. K. LEE, Dept. of Physics, Myongji University, Gyeonggi-Do 449-728, Korea, J. M. KIM, Dept. of Electrical Eng., Myongji University, Gyeonggi-Do 449-728, Korea, S. H. JIN, Dept. of Physics, Myongji University, Gyeonggi-Do 449-728, Korea, EUNHYE LEE, KYOYEOL LEE, JOOHYUN LEE, Y. KHANG, Samsung Advanced Institute of Technology, Gyeonggi-do 449-712, Korea , Y. S. KIM, Dept. of Electrical Eng., Myongji University, Gyeonggi-Do 449-728, Korea, C. J. KANG, Dept. of Physics, Myongji University, Gyeonggi-Do 449-728, Korea — Electrical properties of silicon nanocrystals (NCs) were characterized by scanning probe microscopy (SPM). The NC samples were produced by pyrolysis and laser ablation methods and followed by a process for sharpening steps to improve the size uniformity and to isolate each NC. Direct injection and removal of charge from the conducting tip to a NC was carried out and the measurement of very small amount of capacitance variation was performed. The results were analyzed with respect to the shape, size and the materials of capping shell of NCs and indicated the charging characteristics of NCs. To find out the effect of interface states reduction through a sharpening oxidation, we observed C-V dependence of NCs with different capping shells and the results were compared with those of conventional MOS capacitor.

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