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Abstract

Using the sol-gel method, strontium titanate films were prepared (strontium titanate xerogels) on monocrystalline silicon substrates at 750°C annealing temperature. Nickel upper electrodes were deposited by magnetron sputtering, and the current–voltage characteristics were measured for the prepared structures with two upper electrodes and a Schottky barrier. Significant changes in the current–voltage characteristics were observed after illuminating the diode structure with a halogen lamp characterized by 57 mW/cm² intensity and 3123°C color temperature of the tungsten filament. For a 65-nm thick strontium titanate film under reverse bias voltage of –3 V the photocurrent is 80 μA, whereas without illumination the reverse current is close to zero. Under direct illumination and a voltage of 3 V the photocurrent is 190 μA, while without illumination the current does not exceed 22.5 μA.

Keywords

sol-gel method strontium titanate photocurrent