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HIGH-k LaCeO FOR PASSIVATION OF Si SUBSTRATE

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ABSTRACT- High dielectric constant rare earth lanthanum cerium oxide (LaCeO) films have been studied as the passivation layers for silicon substrate. Effects of post-deposition annealing time (15, 30, and 45 min) was carried out at 700ºC towards structural and morphological characteristics of the films. As the annealing time was increased from 15 to 45 min, a shift in the diffraction angles, peak intensity, and peak width obtained from high resolution X-ray diffraction happened and resulted in changes in term of crystallite size and lattice strain present in the films. Corresponding influence on the film roughness has been also explored. A functional metal-oxide-semiconductor (MOS) based capacitor using the LaCeO film was fabricated in order to study current-voltage characteristics of the sample.

Keywords: dielectric constant, rare earth, passivation, metal-oxide-semiconductor.