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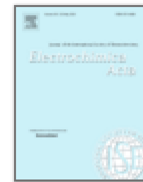

Properties of SiO2 thin films prepared by anodic oxidation under UV illumination and rapid photothermal processing

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Abstract

Anodic oxidation under ultraviolet (UV) illumination and rapid photothermal processing technique used for high quality oxide preparation in terms of device surface passivation and gate or tunnel dielectrics are reported. A number of samples of SiO_2 thin films were prepared using this technique. It is shown that anodic oxidation under UV illumination followed by rapid photothermal processing (450 °C, 15 s) in the inert ambient yields the best optimization of the SiO_2 thin films properties. Avoiding high temperature process should result in a better performance of the semiconductor devices. Anodic oxidation under UV illumination at low temperature and post-oxidation photothermal processing can be a possible alternative to the furnace growth silicon oxide; not only because of the low temperature process, but also because this technology essential improves the oxides properties.