

LOW TEMPERATURE DEGRADATION AND DEFECT RELATIONSHIP IN YSZ CERAMIC

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Abstract: In this work, the relationship between tetragonal to monoclinic phase transformation and Photoluminescence (PL) spectrum were studied for 3 mol% YSZ samples sintered in air and argon atmosphere at 1500°C. Low temperature degradation study was conducted under autoclave condition containing superheated steam at 180°C and 10 bar vapour pressure for periods up to 12 hours. Photoluminescence (PL) studies was conducted by using a PL spectroscope with He-Cd laser at a wavelength of 325 nm as the excitation source, and the phase content in the zirconia samples was measured using X-ray diffractometer (XRD). The studies concluded that argon gas sintered samples have higher structural vacancy than air sintered sample, argon gas sintered sample showed rapid phase transformation than air sintered sample, and that the defect associated with oxygen vacancies in the zirconia lattice increases with increasing ageing time.