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Photoluminescence studies of silica stabilized zirconia after CO₂ laser annealing for high temperature applications

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Laser annealing has attracted considerable attention due to its localized interaction with the treated sample and its possibility to achieve low manufacturing costs in materials processing. One of the most used sources for laser annealing is the CO₂ laser. In this research we used this type of laser for the annealing process of silica stabilized zirconia at different laser power. The effects of the annealing process and its dependence with laser annealing power were analyzed by the photoluminescence response at room temperature and with an excitation line on 488 nm. The optical response of samples annealed at different laser power is an intense double emission band centered on 694 nm, with a lower band at slightly higher wavelengths. The structure analysis by XRD shows the existence of crystalline structure at the annealed samples. The mentioned oxides alloy is a good candidate for high temperature applications.

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