



Photoluminescence of chemical bath deposited ZnO:Al films treated by rapid thermal annealing

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Abstract

Aluminum-doped zinc oxide (ZnO:Al) films fabricated by chemical bath deposition are characterized using scanning electron microscopy and photoluminescence (PL) spectroscopy. The impact of rapid thermal annealing (RTA) upon the morphology and luminescence characteristics of ZnO:Al layers is studied in an annealing temperature interval up to 650 °C. The as deposited films consist of high quality microcrystalline grains surrounded by a material of poor quality. RTA at temperatures around 650 °C proves to increase the grain size, enhance the ultraviolet PL with simultaneous suppression of the visible luminescence, and activate the Al donor impurities.