

PO4052

**THE EFFECT OF ANNEALING ON THE PROPERTIES OF ZnO:Al FILMS GROWN BY RF MAGNETRON SPUTTERING.**Saâd Rahmane<sup>1</sup>, Djouadi Mohamed Abdou<sup>2</sup>, Aida Mohamed Salah<sup>3</sup>, Barreau Nicolas<sup>2</sup>

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The effect of annealing temperature ranged from 200 to 600 °C on the structural, optical and electrical properties of aluminum doped zinc oxide (ZnO:Al) films was reported. The thin films were deposited on glass and silicon substrates by rf magnetron sputtering method using ZnO target (diameter 7,5 cm) mixed with 2 wt.% Al<sub>2</sub>O<sub>3</sub>. It has been found that the crystal structure of ZnO:Al films is hexagonal with c-axis preferential orientation. With an increase in the annealing temperature the intrinsic compressive stress was found to decrease, and near stress-free film was obtained after annealing at 600 °C. A resistivity of  $1.25 \times 10^{-3} \Omega\text{cm}$  and an average transmittance above 90 % in visible range were obtained for films prepared at room temperature.

**Keywords**

Magnetron sputtering

Al doped ZnO

Thin films

Annealing temperature

Properties