Atomic vapor deposition approach to In_2O_3 thin films.

Autorzy

M. Hellwig

H. Parala

Joanna Cybińska

D. Barreca

A. Gasparotto

B. Niermann

H. W. Becker

D. Rogalla

J. Feydt

S. Irsen

Anja Verena Mudring

J. Winter

R. A. Fischer

A. Devi

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Streszczenie

In2O3 thin films were grown by atomic vapor deposition (AVD) on Si(100) and glass substrates from a tris-guanidinate complex of indium [In(N i Pr2guanid)3] under an oxygen atmosphere. The effects of the growth temperature on the structure, morphology and composition of In2O3 films were investigated. X-ray diffraction (XRD) measurements revealed that In2O3 films deposited in the temperature range 450–700 °C crystallised in the cubic phase. The film morphology, studied by scanning electron microscopy (SEM) and atomic force microscopy (AFM), was strongly dependent on the substrate temperature. Stoichiometric In2O3 films were formed under optimised processing conditions as was confirmed by X-ray photoelectron and X-ray excited Auger electron spectroscopies (XPS, XE-AES), as well as by Rutherford backscattering spectrometry (RBS). Finally, optical properties were investigated by photoluminescence (PL) measurements, spectroscopic ellipsometry (SE) and optical absorption. In2O3 films grown on glass exhibited excellent transparency (≈90%) in the Visible (Vis) spectral region.

Słowa kluczowe

In2O3, thin films, AVD, Morphology, composition

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