
Thin film crystallization of Y and Er doped sol-gel derived hafnia

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Abstract

Work is carried out on the effect of Y and Er dopants on the crystal evolution in amorphous sol-gel derived hafnia thin films. While Er doping is of interest to obtain high luminescence intensities, Y has been used to stabilise high temperature crystal phases with higher dielectric constants or ferroelectric properties at room temperature. Er and Y doped HfO₂ thin films were prepared by dip coating technique with varying dopant amount between 0 and 20 mol%. The effect on the crystal structure was evaluated using grazing incidence X-ray diffraction. While monoclinic phase was predominant at low doping concentrations, high concentrations led to the stabilisation of the cubic phase for both dopants, with a mix of both phases appearing at intermediate doping levels.

Keywords: hafnia, sol gel, thin film, doping, erbium, yttrium

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