MOCVD OF ZrO_2 THIN FILMS FROM TWO DIFFERENT β-DIKETONATE PRECURSORS: DEPENDENCE OF MICROSTRUCTURE AND GROWTH KINETICS ON THE PRECURSOR

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Thin films of zirconia have been deposited on Si(100) at various substrate temperatures by low-pressure MOCVD using tetrakis(2,2,6,6-tetramethyl-3,5-heptadionato)zirconium(IV), $[Zr(thd)_4]$, and tetrakis(t-butyl-3-oxo-butanoato)zirconium(IV), $[Zr(tbob)_4]$, as precursors. The relationship between the molecular structures of the precursors and their thermal properties, as examined by TGA/DTA will be presented. The films deposited using the two precursors have distinctly different morphologies, though all are of the cubic phase. Films grown from $Zr(thd)_4$ are well crystallized, showing faceted growth at 575°C, whereas those grown from $Zr(tbob)_4$ are not well crystallized and display cracks. Differences in the observed microstructures and kinetics for growth from the two precursors are presented.