

Abstract

This work presents a procedure that has never been published before for producing transparent CuAlO_2 thin films. Pulsed laser deposition was used to fabricate films composed of a mixture of Cu_2O and Al_2O_3 in a proportion stoichiometric to CuAlO_2 . Samples were then heat treated using a system designed for rapid thermal annealing in order to achieve complete reaction of the two compounds. It was found that deposited films require a heating ramp rising from room temperature up to 1050°C in the order of seconds, and dwell times at this temperature in the order of minutes. Films fabricated by this procedure are single-phase CuAlO_2 , and have conductivities of up to 0.017 S/cm . The material was found to have grown epitaxially oriented on sapphire substrates by off-plane XRD analysis, and a suitable model for this interface has been proposed.