

Atomic layer deposition of ZnO using alcohol as an oxidant

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ZnO is well-known as an n-type semiconductor material, which has emerged recently to apply to light emitting diodes (LEDs), solar cells, photodetectors and transparent electrodes. In this study, we report atomic layer deposition (ALD) of ZnO using diethylzinc and alcohol as precursors of zinc and oxygen precursors, respectively. The novel chemistry gives ZnO even at low temperature (80 °C) and exhibits the typical self-limiting growth behavior of ALD. The grown films are characterized by spectroscopic ellipsometer, X-ray photoelectron spectroscopy and X-ray diffractometry. In addition, electrical properties of ZnO are investigated with a heterojunction of n-ZnO/p-Si. The diode shows clear rectifying behavior and exhibits a visible light photo-response at reverse bias region.