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## Fabrication of Ti Doped ZnO Nanostructures by Atomic Layer Deposition and Block Copolymer Templates

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ZnO is one of the most attractive transparent conductive oxide (TCO) films because of low toxicity, a wide band gap material and relatively low cost. However, the electrical conductivity of un-doped ZnO is too high to use it as TCO films in practical application. To improve electrical properties of undoped ZnO, transition metal (TM) doped ZnO films such as Al doped ZnO or Ti doped ZnO have been extensively studied. Here, we prepared Ti doped ZnO thin films by atomic layer deposition (ALD) for the application of TCO films. ALD was used to prepare Ti-doped ZnO thin films due to its inherent merits such as large area uniformity, precise composition control in multicomponent thin films, and digital thickness controllability. Also, we demonstrated that ALD method can be utilized for fabricating highly ordered freestanding nanostructures of Ti-doped ZnO thin films by combining with BCP templates, which can potentially used in the photovoltaic applications.

**Keywords:** Ti-doped ZnO, TCO, ALD