PATENT NO. 388708
A METHOD FOR MANUFACTURING VISIBLE TRANSPARENT CONDUCTING MATERIAL

APPLICATION NO. 201731036178

APPLICANT
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ABSTRACT
A method for fabricating an aluminium-doped zinc oxide (AZO) film formed on a substrate, where the sputtering target is prepared by mixing sources of aluminium and zinc in appropriate ratio to form a mixture in presence of a binding agent, pressing the mixture for a prescribed amount of time to form a pellet, sintering of the pellet in a furnace at a higher temperature and subsequent cooling the pellet to ambient temperature.Deposition of the AZO film (3) and Zinc metal film (4) on separate substrates (5) is done in a RF magnetron sputtering chamber. Finally, thermal annealing process is carried out, at a higher temperature and subsequently cooling the substrates to ambient temperature, where the substrates are placed with the film side in face to face position with Zn substrate (4) on the bottom position.

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CLAIM 1

A method for fabricating an aluminium-doped zinc oxide (AZO) film formed on the top of a substrate (5), said method comprisingi)sputtering target preparation comprising the steps of
a)mixing sources of aluminium and zinc in appropriate ratio to form a mixture in presence of a binding agent polyvinyl butyral (PVB) and acetone;b)pressing of the mixture formed in step a) under a pressure for a prescribed amount of time to form a pellet;c)sintering of the pellet in a furnace at higher temperature and subsequently cooling the pellet to ambient temperature;
ii)deposition of the AZO film (3) on a substrate (5) by RF magnetron sputtering chamber comprising the steps ofa)evacuation of the chamber prior to sputtering;b)maintaining a fixed pressure in the chamber during deposition;c)maintaining temperature of the substrate (5), placed on a substrate holder, during deposition and at a fixed distance from sputter gun and rotating the substrate holder for uniform deposition; d)constant flow of gas (Ar) flow to sputter the target;e)radio frequency sputtering power to sputter AZO from the target;
f)cooling down to the ambient temperature; iii)deposition of the Zinc metal thin film (4) on another substrate (5) by RF magnetron sputtering chamber comprising the steps ofa)evacuation of the chamber prior to sputtering;b)maintaining a fixed pressure in the chamber during deposition;c)maintaining temperatureof the substrate, placed on a substrate holder,during deposition and at a fixed distance from sputter gun and rotating the substrate holder for uniform deposition d)constant flow of gas (Ar) to sputter the Zn target; and
e)DC sputtering power to sputter Zn from the target;iv) thermal annealing process and subsequent cooling of the substrate characterized in that the substrates (3, 4) prepared are placed with the film side in face to face position with Zn substrate (4) on the bottom position.