Preparation of zinc oxide thin films by an electrospraying technique

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Zinc oxide (ZnO) is an n-type semiconductor with a wide band gap of 3.3 eV, which shows the excellent electrical and optical properties. ZnO films have attracted considerable interest because they have ability to possess high electrical conductivity, high infrared reflectance and high visible transmittance. ZnO films have attracted attention due to its possible applications in ultraviolet (UV) light-emitting devices, electron-acoustic devices, UVdetectors, etc.
This study aims the preparation of zinc oxide thin films by an electro spraying technique. It involves the decomposition of an aqueous solution of zinc acetate on the glass substrate. A syringe pump was used to maintain the flow rate of the precursor solution. Voltage was applied between the needle tip and ground electrode. The crystal structure of the films was characterized by X-ray diffraction (XRD).The morphology of the film was examined via scanning electron microscope (SEM).A spectrometer was used to measure the transmittance in the visible spectra region. It was found that the uniformity of the film was controlled by different operating parameters like flow rate of the precursor solution, applied voltage and the substrate temperature.