Studies on electrical and optical properties of ZnO nanorods grown on glass substrates using solution method

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ZnO nanorods were grown on glass substrate using aqueous solution method at a temperature of 70 °C. The electrical properties of the nanorods were studied by using 'In' contacts as ohmic contacts at different temperatures from 20 to 150 °C and optical properties of nanorods were analyzed at low temperatures. The electrical measurements exhibit that the resistivity of the nanorods decreased with the increase of temperature and the evaluated activation energy of the ZnO nanorods is found to be ~18 eV. The as-grown ZnO nanorods exhibited two photoluminescence peaks: one sharp peak at around 375 nm and other broad peak between 500-800 nm that belong to ZnO phase and impurities present in the lattice, respectively. On the other hand, the intensity of the PL peaks increased with the decrease of temperature up to 120 K and with further decreased of temperature, the intensity of the peaks varied randomly.