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Novelties in Data Storage Devices

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Abstract

With the rapid growth of electronic technology, higher speed and denser memories are required to meet the trends of Moore's law for miniaturization of devices. This project enhanced my experimental approach and developed my interest to discover new ideas in the advancement of thin film-based devices. I have learnt a lot of experimental techniques especially deposition of thin films techniques hydro-thermal, spin coating method, extract of natural green material e.g. extracts of orange peel and synthesis of nano particle such as synthesize of TiO_2 nano particle through co-precipitation method. We have design TiO_2 based resistive random-access memory (RRAM) which is basically a two terminal device and composed of dielectric insulating layer that is sandwiched between two metal electrodes. Resistive RAM works on the principle by changing the resistance through solid dielectric layer under voltage sweep which means device can be programmed into low resistance state (LRS) or ON state and high resistance state (HRS) or OFF state. We have successfully deposit TiO_2 thin films on transparent fluorine doped tin oxide (FTO) glass substrate under various reaction time and different protocol. Prepared thin films were characterized structurally, electrically, optically and especially resistive switching behavior. we have found hybrid phase (anatase & rutile) of TiO_2 exhibits more resistive switching behavior than single rutile phase on behalf of point defects or oxygen vacancies inside oxide layer. Optical analysis reveals the existence of oxygen vacancies and Ti interstitial defects inside TiO_2 oxide layer. Finally, we have succeeded to demonstrate the bipolar nature of resistive switching in TiO_2 layer at very low voltage regime.

Biography

Muhammad Sultan Irshad has completed his/her master's degree at the age of 25 years from COMSATS University Islamabad, Pakistan. He is the PhD scholar under highly motivated and worth taking issue regarding water scarcity project at well renowned school in china" School of Material Science and Engineering at Hubei University, China. He has over 3 publications. In this project, my group has been emerged as a strong candidate to sort out this issue using photothermal conversion of carbon-based material for solar driven evaporation to yield fresh water and energy storage applications.

In the last, I am highly motivated young researcher and devote myself to explore the new wonders in this field because its appealing me to do something for humanity. I want to participate in this conference, I have attended many conferences in Pakistan, but it would be my first international conference in European countries if I get some financial support. I am thinking positive and motivated for your valuable feedback.

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