

ET-001

Two dimensional tin sulfide for photoelectric device

Malkeshkumar Patel and Joondong Kim

광전 및 에너지소자 연구실(Photoelectric and Energy Device Application Lab, PEDAL)

The flexible solid state device has been widely studied as portable and wearable device applications such as display, sensor and curved circuits. A zero-bias operation without any external power consumption is a highly-demanding feature of semiconductor devices, including optical communication, environment monitoring and digital imaging applications. Moreover, the flexibility of device would give the degree of freedom of transparent electronics.

Functional and transparent abrupt p/n junction device has been realized by combining of p-type NiO and n-type ZnO metal oxide semiconductors. The use of a plastic polyethylene terephthalate (PET) film substrate spontaneously allows the flexible feature of the devices. The functional design of p-NiO/n-ZnO metal oxide device provides a high rectifying ratio of 189 to ensure the quality junction quality. This all transparent metal oxide device can be operated without external power supply. The flexible p-NiO/n-ZnO device exhibit substantial photodetection performances of quick response time of 68 μ s.

We may suggest an efficient design scheme of flexible and functional metal oxide-based transparent electronics.

Keywords: SnS, Photoelectric devices, Zero bias, Transparent, Photodetector

ET-002

Ultrafast and flexible UV photodetector based on NiO

Hong-sik Kim, Malkeshkumar Patel, Hyunki Kim and Joondong Kim

광전 및 에너지소자 연구실(Photoelectric and Energy Device Application Lab, PEDAL)

The flexible solid state device has been widely studied as portable and wearable device applications such as display, sensor and curved circuits. A zero-bias operation without any external power consumption is a highly-demanding feature of semiconductor devices, including optical communication, environment monitoring and digital imaging applications. Moreover, the flexibility of device would give the degree of freedom of transparent electronics.

Functional and transparent abrupt p/n junction device has been realized by combining of p-type NiO and n-type ZnO metal oxide semiconductors. The use of a plastic polyethylene terephthalate (PET) film substrate spontaneously allows the flexible feature of the devices. The functional design of p-NiO/n-ZnO metal oxide device provides a high rectifying ratio of 189 to ensure the quality junction quality. This all transparent metal oxide device can be operated without external power supply. The flexible p-NiO/n-ZnO device exhibit substantial photodetection performances of quick response time of 68 μ s.

We may suggest an efficient design scheme of flexible and functional metal oxide-based transparent electronics.

Keywords: hotodetectors, Metal oxides, Flexible, Transparent, Photodetector