Photoelectrical resistive switching memory using ZnO nanowire structure

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In this work, a non-volatile resistive optoelectronic memory is demonstrated in a flexible system that plays the dual roles of a reversible photo-reactive element and a signal-collecting element. We attempted to demonstrate the tactile sensor by detecting the rotation angle and bending angle of the wearable information appliance worn by the user. This motion-sensing for certain critical angle and information-storing functionality is enabled by photo-tunable resistive switching behaviors, which results from bending the flexible device in diverse convex angles with respect to the incident light direction. Furthermore, we investigated the basic mechanism of resistive photoelectrical switching behaviors by studying the effects of electrostatic barrier a t the Au/ZnO junction, e.g., a Schottky barrier depending on the photonic and electric condition. Moreover, by employing a polymer structure, application in a prototype device provided improved endurance or retention of data.