A Light Incident Angle Stimulated Memristive Switching Behavior

박진주, 용기중*
포항공과대학교
(kyong@postech.ac.kr*)

Among possible choices of signal controlling factors of memristor, photon is particularly attractive because photonic signals efficiently manage the interactions without any signal interference. Furthermore, due to the inherent wave characteristics of photons, the facile manipulation of the light ray could enable incident light angle controlled memristive switching. To demonstrate this light direction controlled memory device functionality, we have fabricated a MIM memristive switching nanodevice using ZnO nanorods. Superhydrophobicity employed in this memristor gives rise to illumination direction selectivity as an extra controlling parameter which is important feature in emerging. When light irradiates from a point source in water to the surface treated device, refraction of light ray takes place at the water/air interface because of the optical density differences in two media (water/air). When incident light travels through a higher refractive index medium (water; n = 1.33) to lower one (air; n = 1), a total reflection occurs for incidence angles over the critical value . From this processes, the reversible switching characteristics were verified by modulating the light incident angle between the resistor and memristor.