SW-P015

Patterned Arrays of Well-Ordered ZnO Nanorods Assisted with Polystyrene Monolayer By Oxygen Plasma Treatment

Hyun Ji Choi[1,2], Yong-Min Lee[1], Yulhee Lee[1], Hyeon Jin Seo[1], Ki-Hwan Hwang[1,2], Dong In Kim[1], Jung-Hoon Yu[1], Jee Yun Kim[1,2], Sang Hun Nam[2], Jin-Hyo Boo[1]*

[1]Department Of Chemistry, Sungkyunkwan University 440-746 Suwon, Republic of Korea, [2]Institute Of Basic Science, Sungkyunkwan University 440-746 Suwon, Republic of Korea

Zinc Oxide (ZnO) was known as a promising material for surface acoustic wave devices, gas sensors, optical devices and solar cells due to piezoelectric material, large band gap of 3.37 eV and large exciton binding energy of 60 meV at room temperature. In particular, the alignment of ZnO nanostructures into ordered nanoarrays can bring about improved sensitivity of devices due to widen the surface area to catch a lot of gas particle. Oxygen plasma treatment is used to specify the nucleation site of round patterned ZnO nanorods growth. Therefore ZnO nanorods were grown on a quartz substrate with patterned polystyrene monolayer by hydrothermal method after oxygen plasma treatment. And then, we carried out nanostructures by adjusting the diameter of the arranged ZnO nanorods according to polystyrene spheres of various sizes. The obtained ZnO nanostructures was characterized by X-ray diffraction (XRD), Field emission scanning electron microscopy (FE-SEM).

Keywords: ZnO nanostructures, Hydrothermal method, Polystyrene monolayer, Oxygen plasma treatment

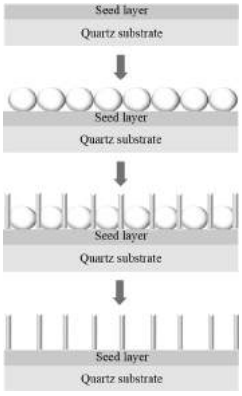

Fig. 1

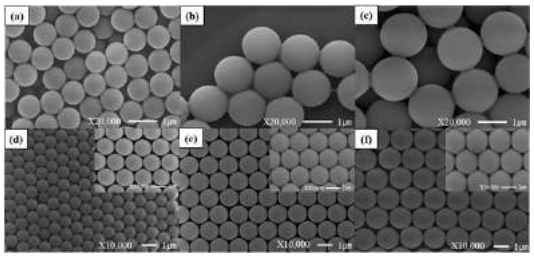

Fig. 2

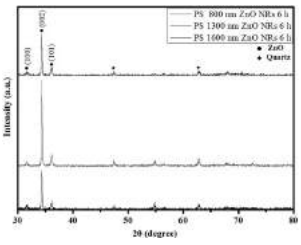

Fig. 3

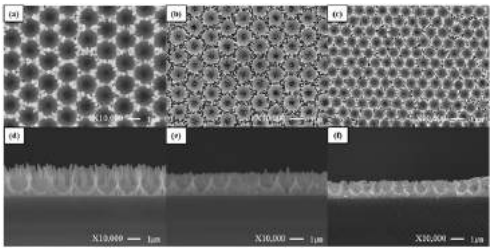

Fig. 4

Size (nm)	Solvent (ml)	Styrene (ml)	Initiator (g)	Stabilizer (g)	Reaction Time (h)	Reaction temp. (℃)
PS 1600	EtOH 100	10	0.1	1.0	24	60
PS 1300	EtOH 100	10	0.1	1.0	16	60
PS 800	EtOH 100	10	0.1	1.0	8	60

Table 1