

Breath sensor fabricated with ZnO nanostructure

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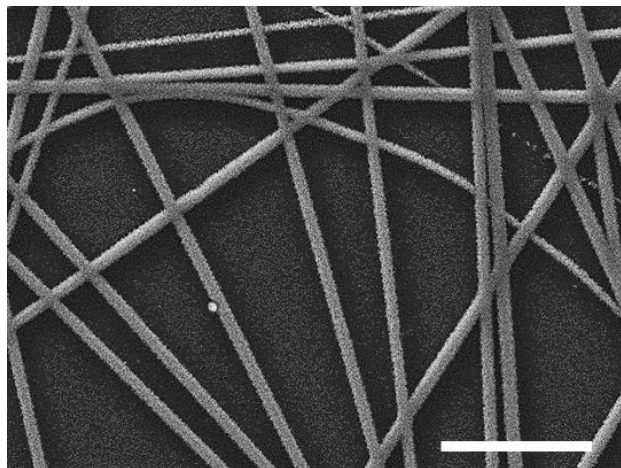
Abstract

Structural colored surface exhibits various colors due to diffraction of light and interference effects. One of the structural colored surface in the nature is Morpho butterfly's blue color caused by chitin structure¹. We fabricated structural colored surface with nano structure of ZnO. To fabricate ordered and much controlled shape, we used electrospinning method to fabricate its structure. We added seed layer material in the electrospinning solution and annealed it to fabricate seed layer without polymer component. After that, we used hydrothermal method to fabricate hierarchical structure which can control structural color by controlling reaction time. Due to electrospinning method's unique characteristic, we can align seed layer with highly aligned or highly random shapes. By controlling reaction time, solution concentration and reaction temperature, the colors of surface can be controlled. Aligned structure can be used as electrical sensing electrode and its color also can be detected. The structural color is changed due to the humidity because of the reflectivity change.

References

- [1] O. Sato, S. Kubo and Z. Gu, Accounts of chemical research., 2009, 42, 1-10.

Figures



(Scale bar : 10 μ m)

Figure 1: Fabricated ZnO nanostructures for humidity sensing.

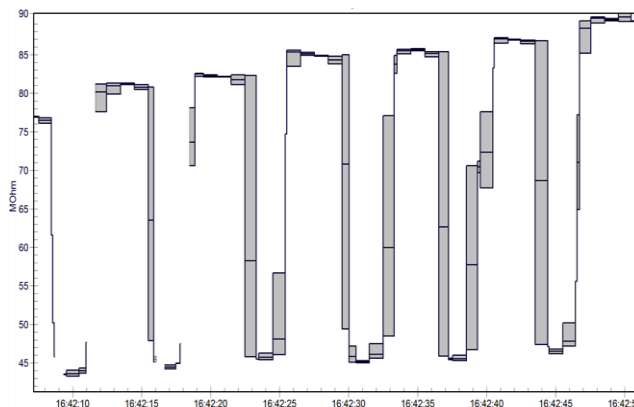


Figure 2: Resistance change between inhale condition and exhale condition.