

Metallic Nanopattern based VOCs Gas Sensor

유해욱, 진환진, 정희태*
KAIST
(heetae@kaist.ac.kr*)

Chemiresistor is one of the gas sensors which changes resistance of sensing channel by exposure to target VOCs (Volatile Organic Compounds). The chemiresistor has some great features like as miniaturization, low power consumption, reversible and repeatable operation. In this study, we propose the new concept for the chemiresistor sensing channel by metallic nanopatterned structure. This nanopatterned structure was fabricated by modified secondary sputtering lithography technique (SSL), which was developed in this research group in 2010. This SSL technique can produce the high resolution and high aspect ratio of nanopattern (e.g. 15nm width and 200nm height metallic nanopattern) and the process condition was controlled to prepare the small feature sized nanopattern for the optimization of sensing performance by surface scattering of electron. This small feature sized nanowire array ($h < 40\text{nm}$) would provide the high sensitivity because the large portion of the electron flows on the surface of the metallic structure and good long term stability since the nanowire array is stably immobilized on the substrate. The sensing performance for the Pt nanowire array as chemiresistor will be further discussed.