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Temperature dependent response of ZnO based H_2S gas sensor

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Abstract

Selectivity is one of the major issues in semiconductor-based gas sensors. To achieve selectivity, multiple sensors are required, which increases the power consumption as well as complexity. Alternatively, temperature programming can be used to achieve selectivity with a single sensor. Herein, we investigated the temperature dependent response of ZnO nanostructures based H_2S sensor. This large variation in sensor response with temperature can be useful in developing a single sensor-based electronic nose to detect a gas selectively.

Results and Discussions

The response of the sensor significantly decreases with an increase in temperature as shown in Figure 1. It is attributed to adsorbed oxygen molecules, adsorption-desorption rate, and the number of surface charge carriers, which vary with temperature.

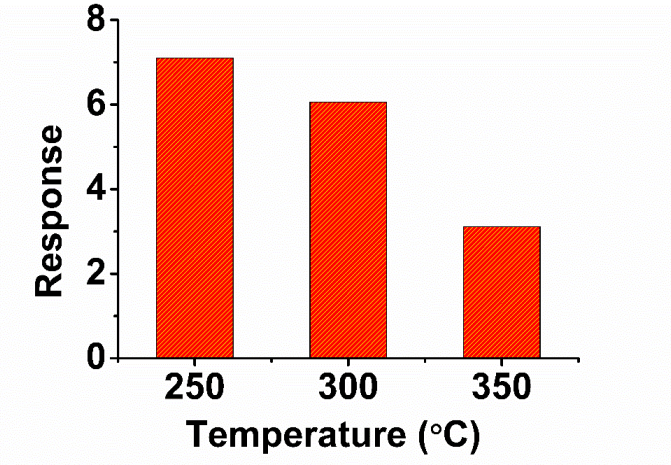

Figure 1. The response of the sensor upon exposure of 4 ppm H_2S

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