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| **Title:** | Honeycomb-like MoS2 Nanotube Array-Based Wearable Sensors for Noninvasive Detection of Human Skin Moisture. | | |
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| **Abstract:** |  |
| Technological advances in wearable electronics have driven the necessity of a highly sensitive humidity sensor that can precisely detect physiological signals from the human body in real time. Herein, we introduce the anodic aluminum oxide (AAO)- assisted MoS2 honeycomb structure as a resistive humidity sensor with superior sensing performance. The unique honeycomb-like structure consists of MoS2 nanotubes, which can amplify the sensing performance because of their open pores and wider surface absorption sites. The formation of uniform MoS2 nanotubes inside the AAO membrane was manipulated by the number of vacuum filtration cycles of the (NH4)2MoS4 solution. The proposed humidity sensor exhibits an elevated sensitivity that is 2 orders of magnitudes higher than the MoS2 film-based humidity sensor at the relative humidity range of 20−85%. Moreover, the sensor showed significantly faster response and recovery times of 0.47 and 0.81 s. In addition, we demonstrate the multifunctional applications such as noncontact sensation of human fingertips, human breath, speech recognition, and regional sweat rate, which show its promising potential for the next-generation wearable sensors. | |