

Accepted Manuscript

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PII: S0925-4005(18)30583-5
DOI: <https://doi.org/10.1016/j.snb.2018.03.093>
Reference: SNB 24378

To appear in: *Sensors and Actuators B*

Received date: 6-11-2017
Revised date: 12-3-2018
Accepted date: 15-3-2018

Please cite this article as: Jun-Ge Liang, Eun-Seong Kim, Cong Wang, Myung-Yeon Cho, Jong-Min Oh, Nam-Young Kim, Thickness Effects of Aerosol Deposited Hygroscopic Films on Ultra-Sensitive Humidity Sensors, *Sensors and Actuators B: Chemical* <https://doi.org/10.1016/j.snb.2018.03.093>

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Thickness Effects of Aerosol Deposited Hygroscopic Films on Ultra-Sensitive Humidity Sensors

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Highlights

- Aerosol deposition can be used to prepare ultra-sensitive ceramic humidity sensors.
- Film-based sensors were prepared using a shock-loading solidification mechanism of aerosol deposition.
- Their sensitivity depends on the hydrophilicity, pore volume, and open-pore ratio.
- The thickness of the film regularly affects the humidity-sensing properties.

Abstract

Hygroscopic film that has a super mesoporous structure exhibits high sensitivity and fast response/recovery in humidity sensing applications. Aerosol deposition (AD) via a shock-loading-solidification preparation mechanism, which is an unexplored potential hygroscopic film preparation technique, can produce a porous microstructure, and the AD hammering effect creates various interior and surface microstructures in different-thickness films. The objective of our study was to verify the feasibility of using AD as a humidity-sensing film preparation technique, and to investigate the thickness effects of the film on its microstructure and

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