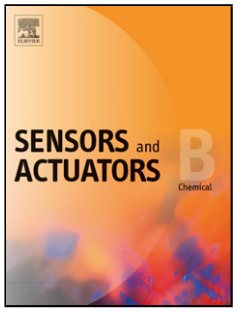


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# Ni-pattern guided GaN nanowire-array humidity sensor with high sensitivity enhanced by UV photoexcitation

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Highlights

- We have proposed a simple Ni-pattern guided lateral growth method to fabricate selective-area GaN nanowire array.
- Ni metal has formed contamination-free and high-quality Schottky-contacted interface with in-situ grown GaN nanowire array.
- In the RH range from 15 % to 85 %, its output current has a sharp decrease from 29.3 to 0.913 μA and from -16.8 to -0.215 μA when biased at 5 and -5 V respectively, exhibiting its ultrahigh RH sensing above two orders of magnitude.
- Its RH sensitivity has been largely enhanced by UV photoexcitation from 3208 % to 10066 % at 5 V and from 7818 % to 24037 % at -5 V, respectively.

## ABSTRACT

Selective-area lateral GaN nanowire array has been one-step fabricated over large scale by Ni-pattern guided chemical vapor deposition (CVD) growth. Two neighboring Ni electrodes, acting as source and drain, can be bridged across by a