Electronic Supplementary Material (ESI) for RSC Advances.

NiO/ZnO p–n heterostructures and gas sensing properties for reduced operating temperature

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Supplementary Information

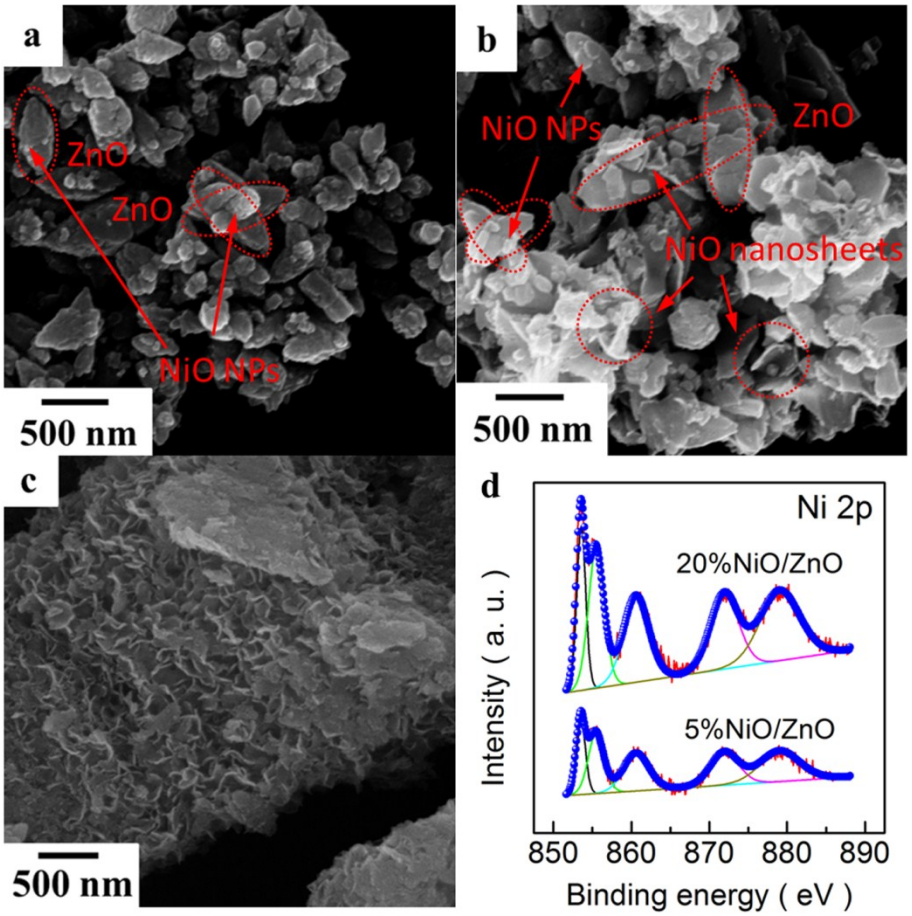

Figure S1. (a) SEM image of the 5%NiO/ZnO heterostructures. (b) SEM image of the 20%NiO/ZnO heterostructures. (c) SEM image of pristine NiO. (d) Ni 2p high–resolution XPS of the 5%NiO/ZnO and 20%NiO/ZnO heterostructures and corresponding Gaussian fittings.

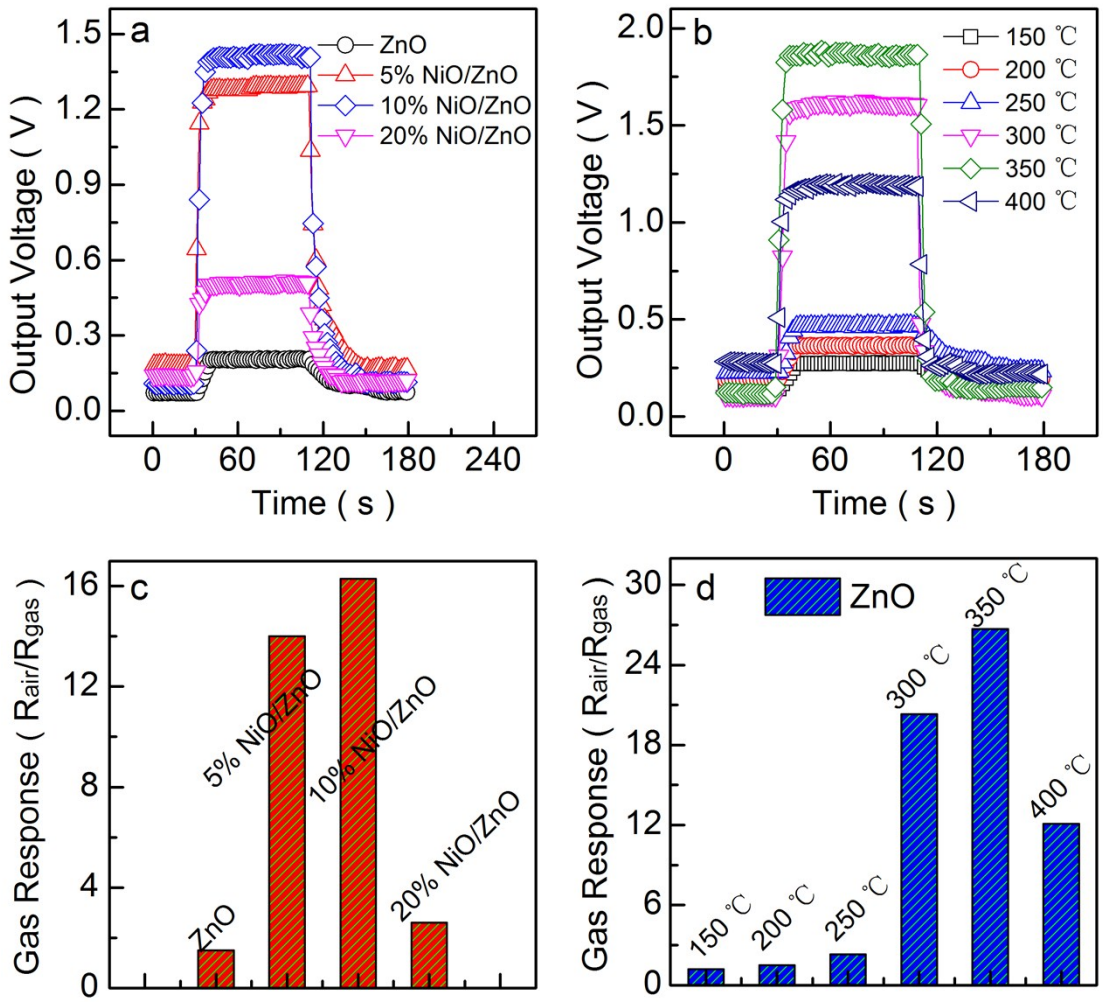

Figure S2. (a) Response curves of different materials in 100 ppm ethanol vapor at operating temperature of 200 ºC. (b) Response curves of the ZnO gas sensor in 100 ppm ethanol vapor at different temperatures. (c) Gas responses of different materials in 100 ppm ethanol at 200 ºC. (d) Gas responses of the ZnO gas sensor in 100 ppm ethanol vapor at different temperatures.

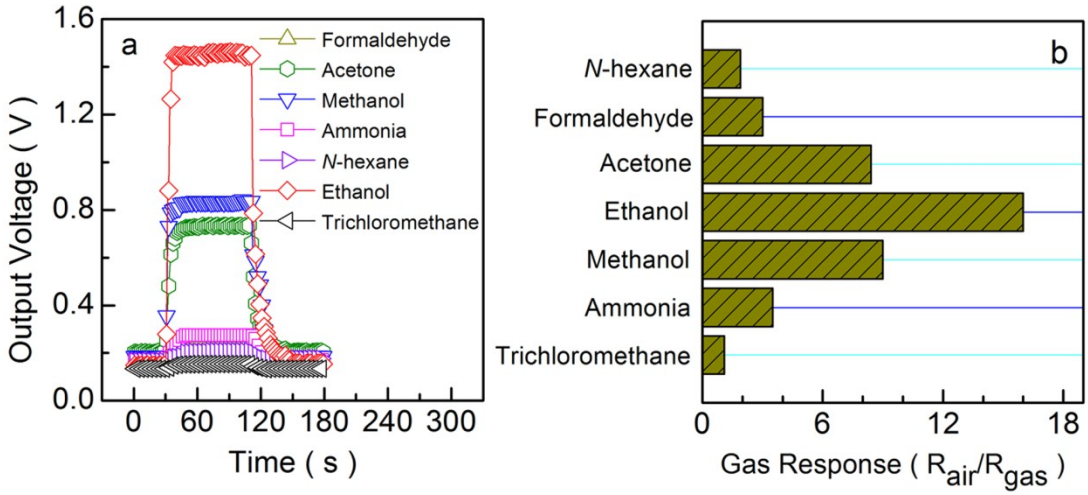

Figure S3. (a) Typical response curves of the 10%NiO/ZnO heterostructures gas sensor for several volatile organic compounds (VOCs) of 100 ppm at 200 ºC. (b) Selectivity of the 10%NiO/ZnO heterostructures sensor for several VOCs.

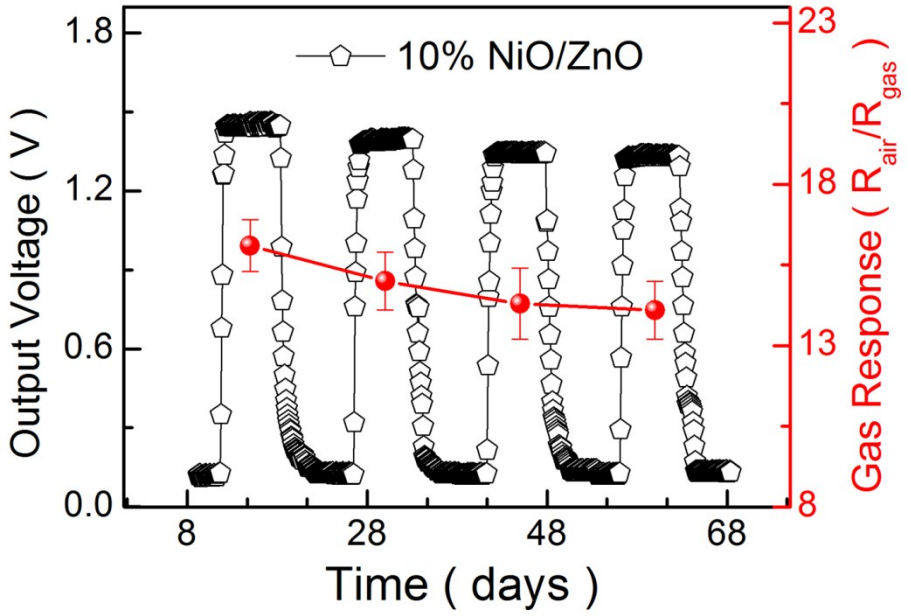

Figure S4. The long–term stability of the 10%NiO/ZnO heterostructures sensor in 100 ppm ethanol vapor at 200 ºC.

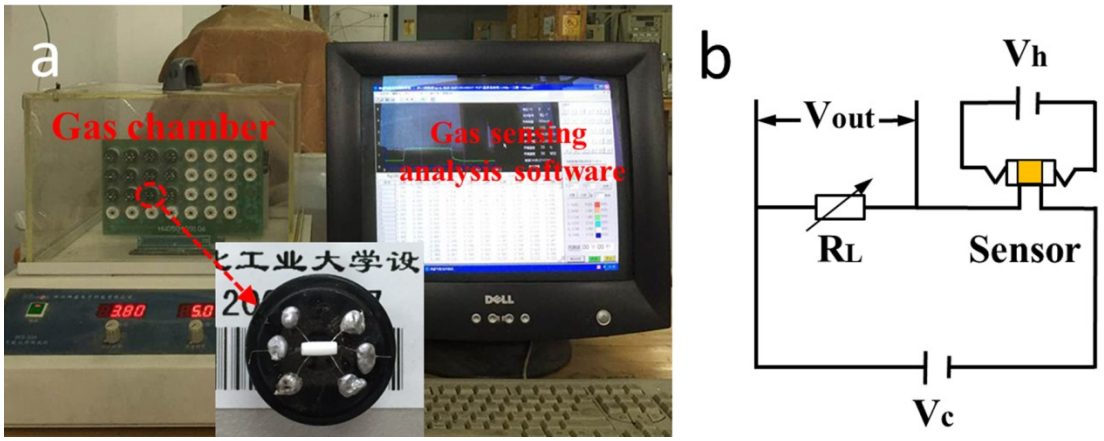

Figure S5. (a) Photograph of the gas–sensing system (Inset: a gas sensor of the 10%NiO/ZnO heterostructures). (b) The measuring electric circuit of the gas–sensing instrument.