Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

A silver electrode based surface acoustic wave (SAW) mercury vapor sensor: a physio-chemical and analytical investigation

K M Mohibul Kabir[1], Ylias M. Sabri[1], Bebeto Lay[1], Samuel J. Ippolito[1,2] and Suresh K. Bhargava[1*]*

[1]Centre for Advanced materials & Industrial chemistry (CAMIC), School of Applied Sciences, RMIT University, Melbourne, VIC 3001, Australia

[2]School of Electrical and Computer Engineering, RMIT University, Melbourne, VIC 3001, Australia

[*]**Corresponding Author:** samuel.ippolito@rmit.edu.au (Phone: +61 3 9925 2673),

suresh.bhargava@rmit.edu.au (Phone: +61 3 9925 2330)

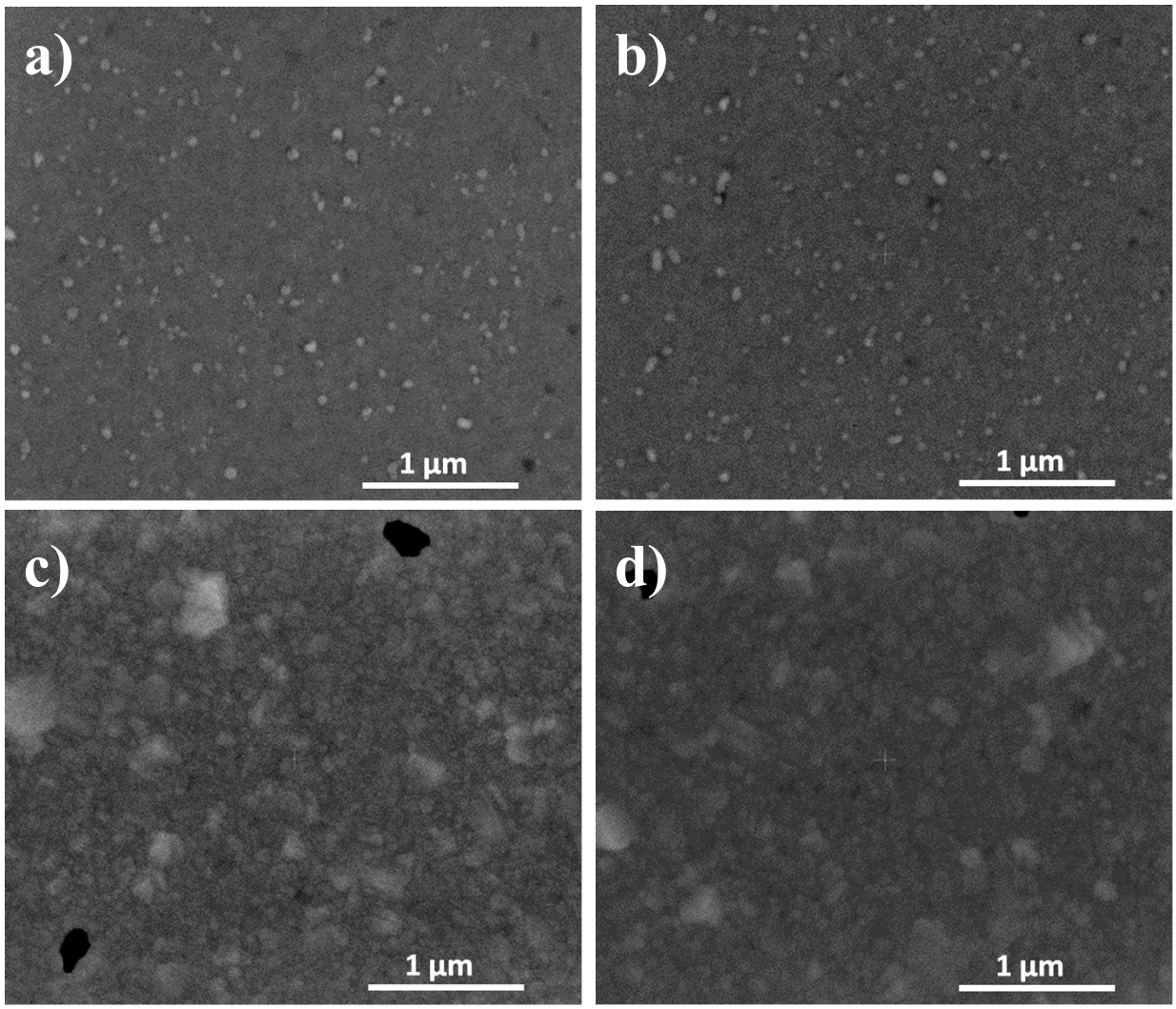

Figure S1: SEM images of the Ag-surface a, b) before and c, d) after three weeks Hg^0 vapor exposure period.

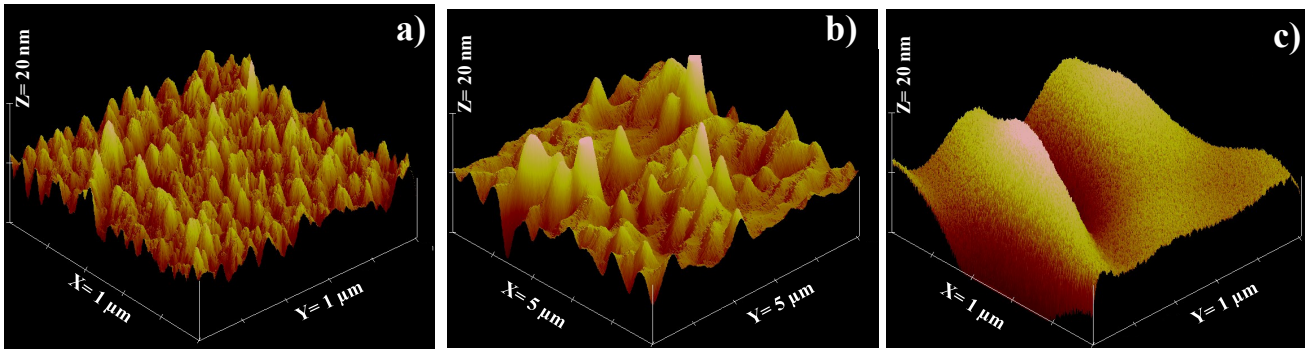

Figure S2: a) AFM image of the Ag surface before Hg^0 vapor exposure tests with X, Y and Z scale size of 1 µm, 1 µm and 20 nm, respectively; and AFM images of the Ag surface after 3-week Hg^0 vapor exposure tests with X, Y and Z scale size of b) 5 µm, 5 µm and 20 nm and c) 1 µm, 1 µm and 20 nm, respectively.

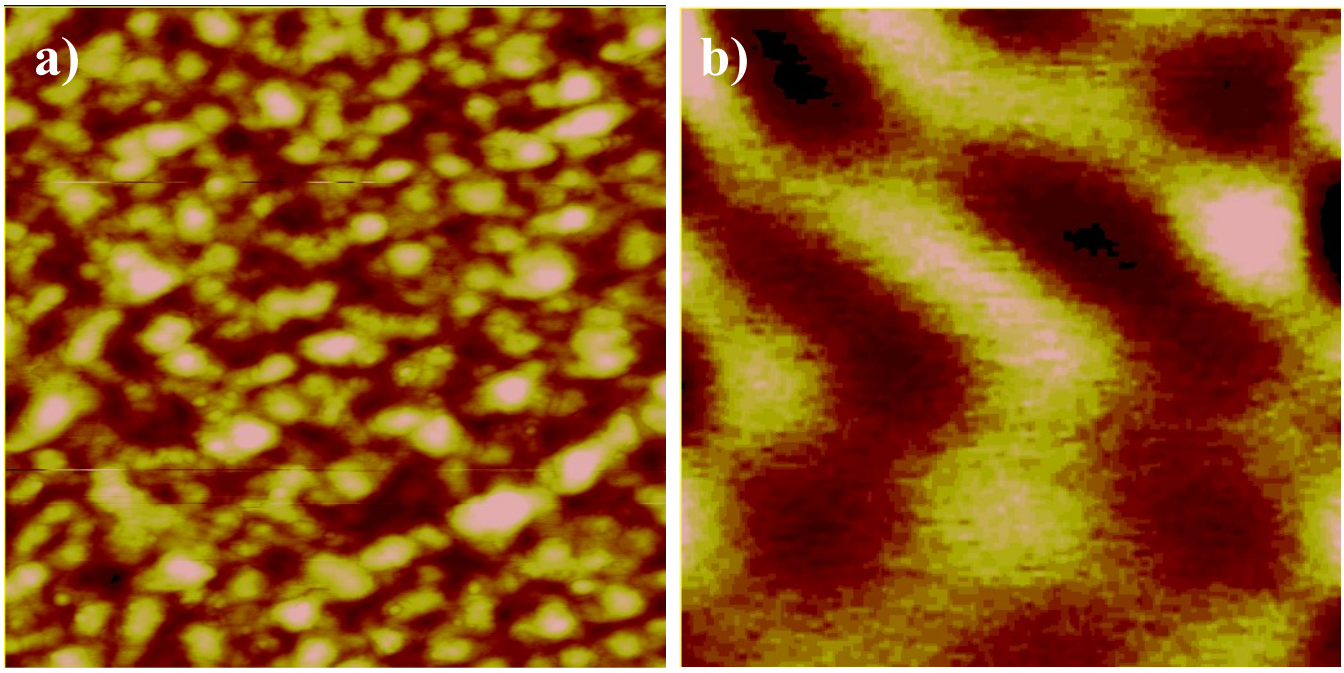

Figure S3: AFM images show the roughness of the Ag-surface a) before and b) after three weeks Hg^0 vapor exposure period. Scan size is 1 x 1 µm.

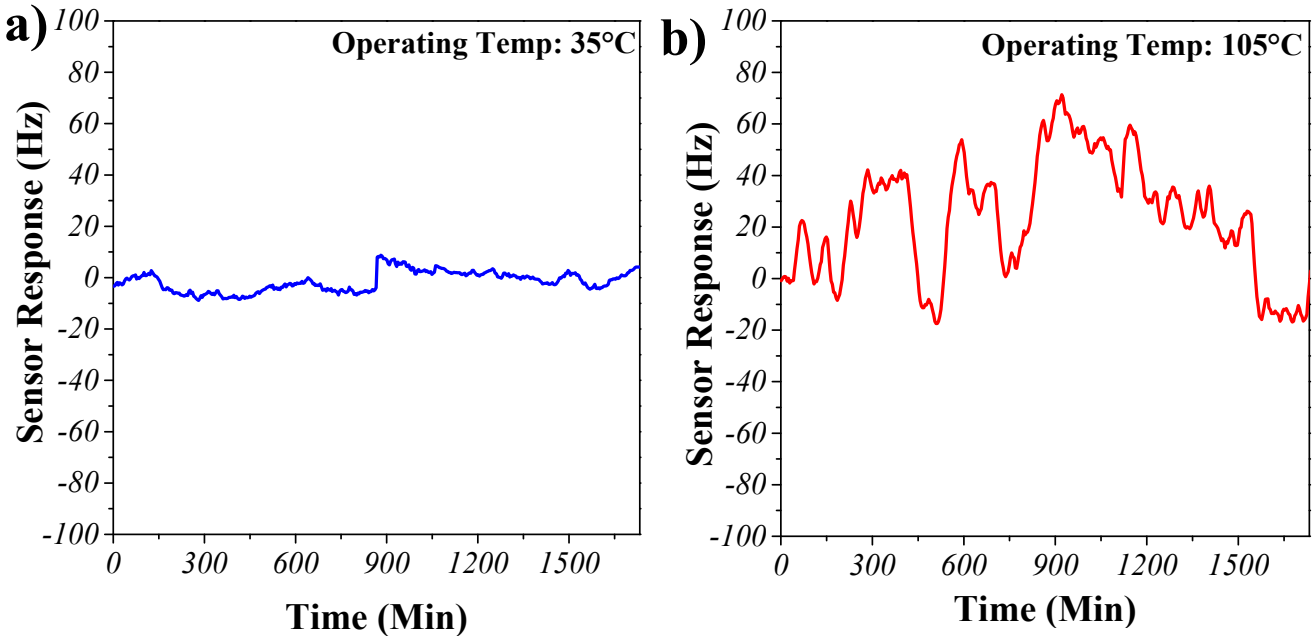

Figure S4: Noise profile of the developed SAW-based sensor while operating at a) 35°C and b) 105°C.

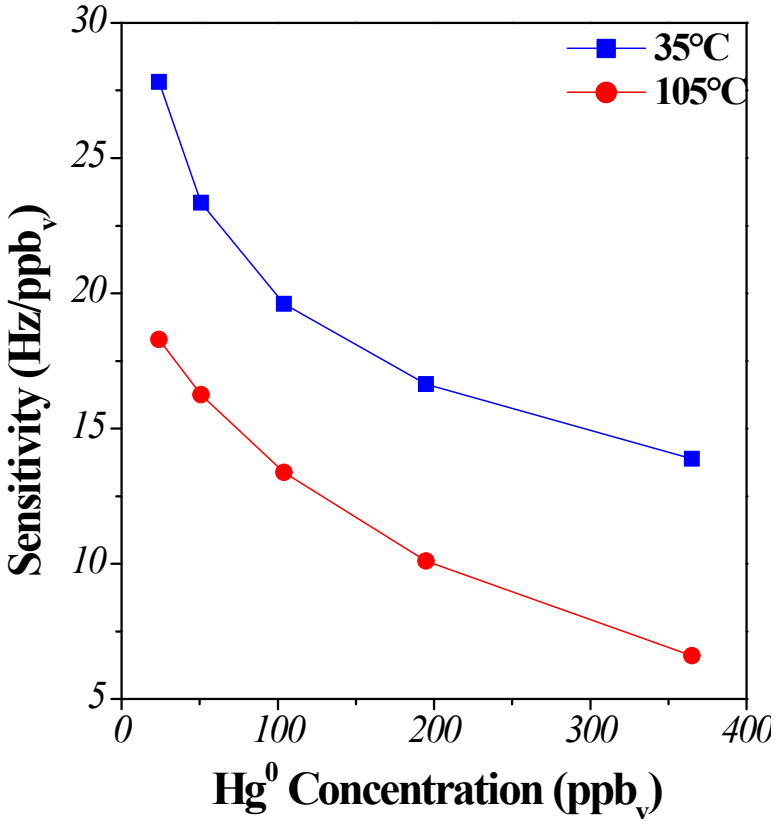

Figure S5: Sensitivity of the developed sensor toward 24-104 ppb_v of Hg^0 vapor exposure at 35 and 105°C.