Supporting Information

Dye colour switching by hydride-terminated silicon nanoparticles and its application as an oxygen indicator

Miaomiao Ye,*[abc] Chenxi Qian,[b] Wei Sun,[b] Le He,[b] Jia Jia,[b] Yuchan Dong,[b] and Wenjie Zhou[b]

[b] State key of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin, 150090, P R China.

[a] Zhejiang Key Laboratory of Drinking Water Safety and Distribution Technology, Zhejiang University, Hangzhou, 310058, P R China

[b] Department of Chemistry, University of Toronto, Toronto, Ontario M5S 3H6, Canada Email: gozin@chem.utoronto.ca;Tel.: +01 416 978 2082

[c] State key of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin, 150090, P R China.

*Email address: yemiao008@zju.edu.cn; Tel.: +86 571 88206759

Figures

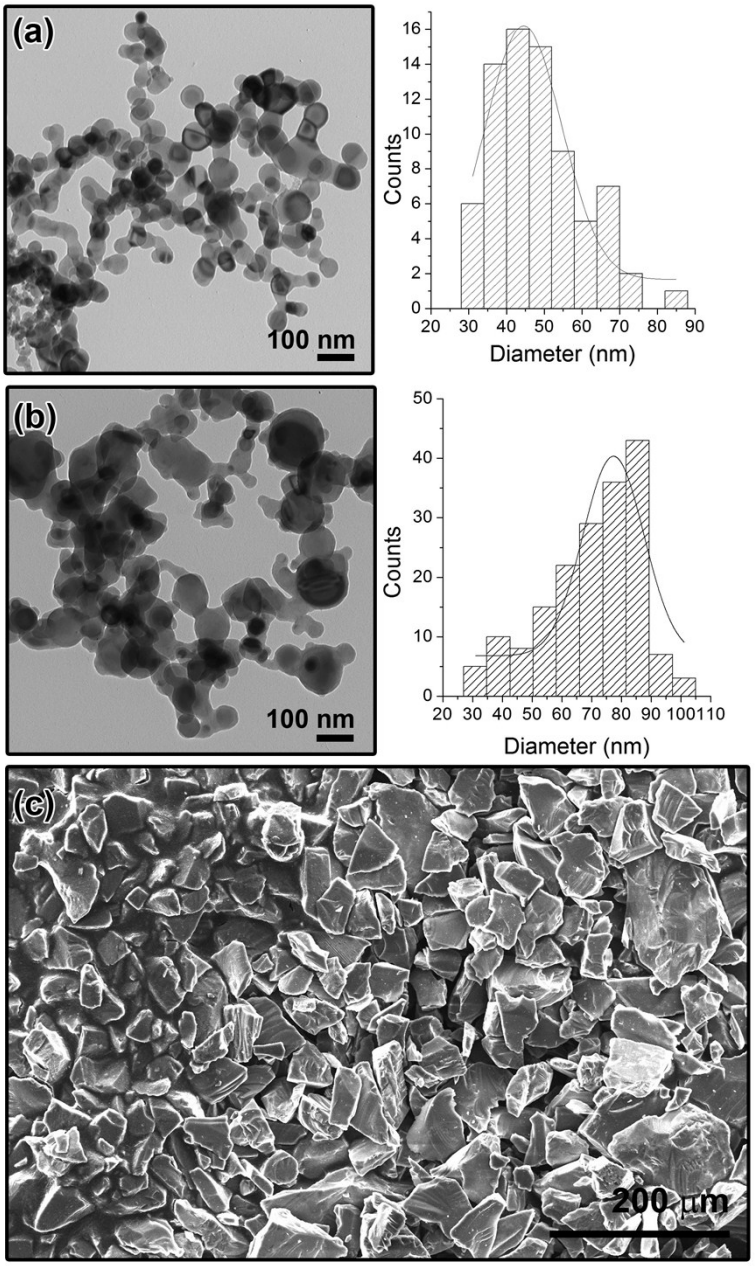

Fig. S1 SEM and TEM images of the hydride-terminated silicon nanoparticles with different sizes. The particle size distributions were calculated by counting more than 80 nanoparticles from TEM and SEM images, which were of (a) ~50 nm, (b) ~80 nm, (c) ~44μm, and denoted as Si:H-50nm, Si:H-80nm, and Si:H-44μm, respectively.

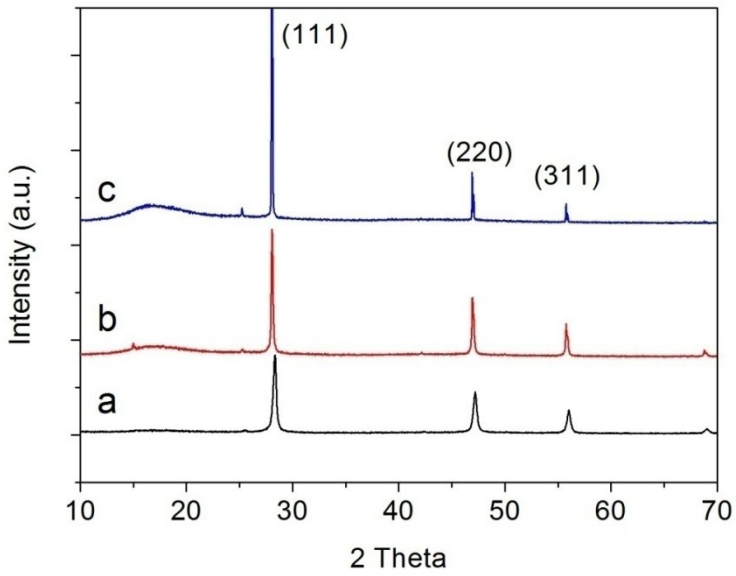

Fig. S2 PXRD patterns of the (a) Si:H-50nm, (b) Si:H-80nm, and (c) Si:H-44µm.

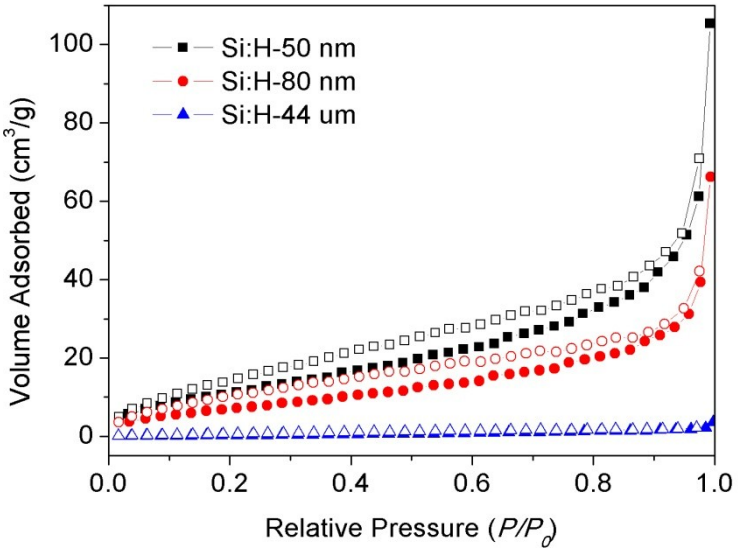

Fig. S3 Nitrogen adsorption-desorption isotherms of the Si:H-50nm, Si:H-80nm, and Si:H-44µm.

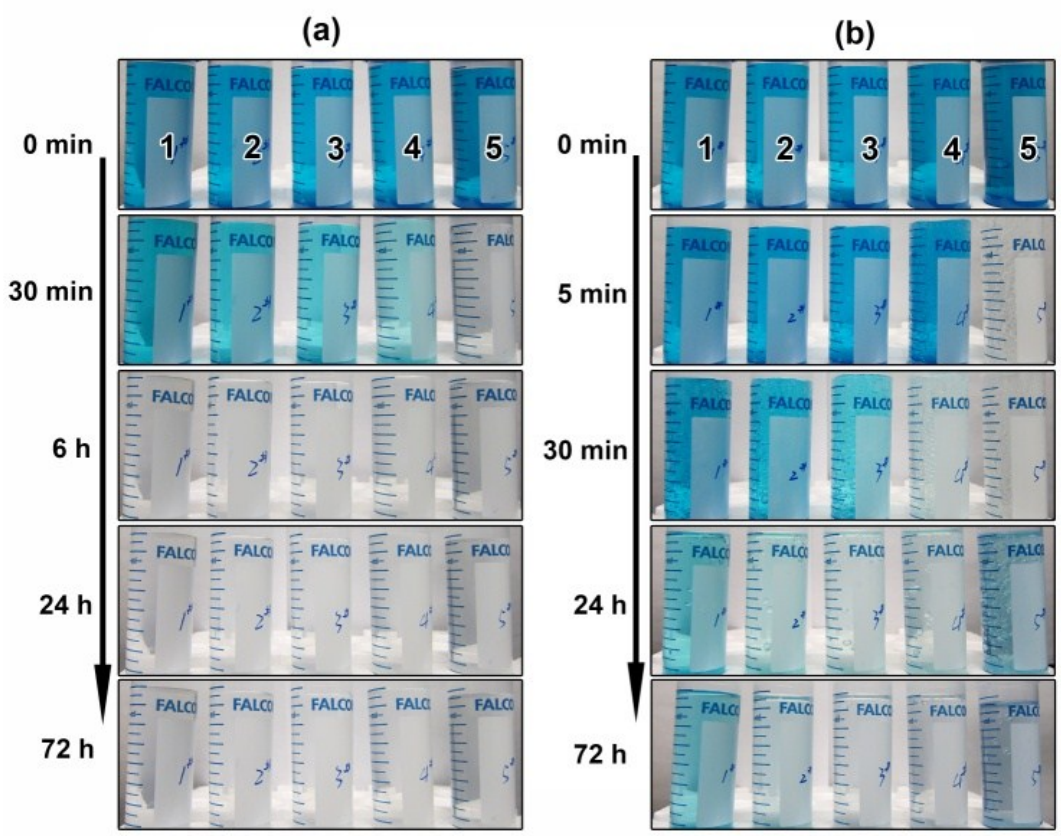

Fig. S4 Reduction and reoxidation of MB by (a) Na_2SO_3 and (b) $NaBH_4$ with different dosage of (1) 40 mg, (2) 80 mg, (3) 160 mg, (4) 320 mg, and (5) 1280 mg, respectively.

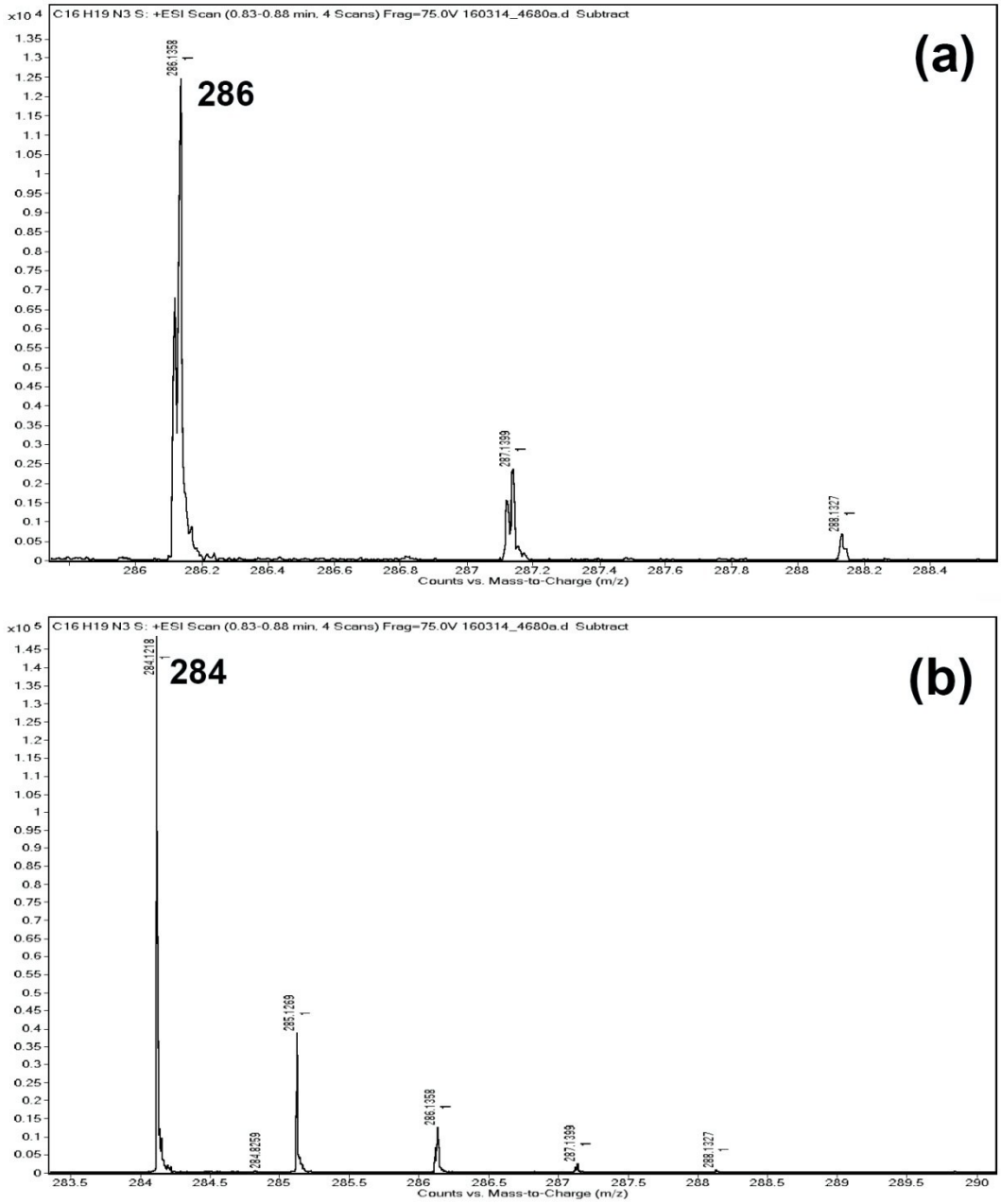

Fig. S5 MS spectra of (a) LMB and (b) MB during the MB reduction process by Si:H-50nm.

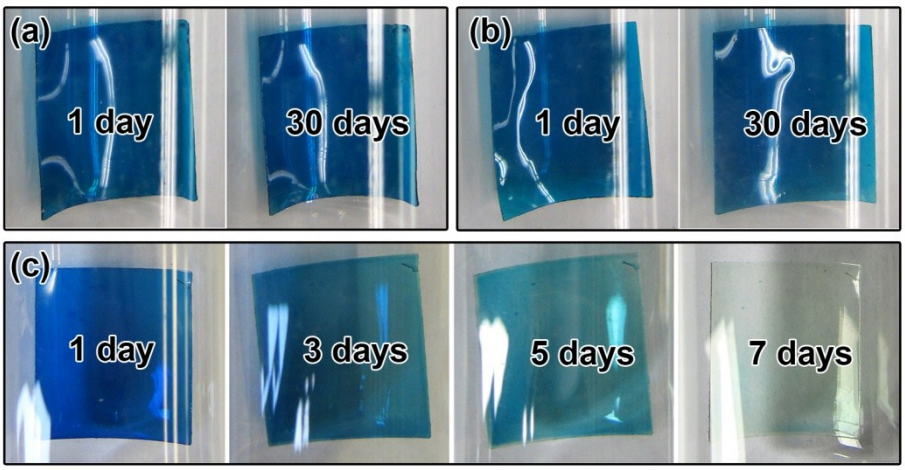

Fig. S6 The oxygen indicator film expose to air and store in (a) dark, (b) fluorescent light and (c) sun light, respectively.

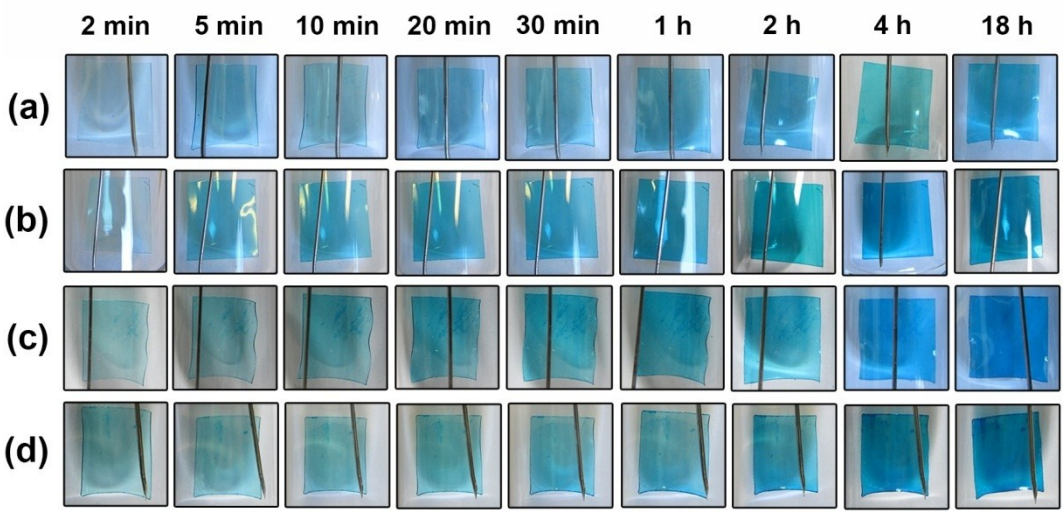

Fig. S7 Digital photos of the oxygen indicator film store in different oxygen-carbon dioxide flow ratios of (a) 1:50, (b) 1:15, (c) 1:4, and (d) 9:1, respectively.