

Supporting information

Integration of jackfruit seed-derived carbon dots and electronic nose for a sensitive detection of formaldehyde vapor

Thitarat PRATHUMSUWAN¹, Sumana KLADSOMBOON², Alfred Antony CHRISTY³, Insik IN^{4,5}, Xiao LIANG⁶, Shufeng SONG⁷, Yao WANG^{8,9}, Thitirat INPRASIT¹⁰, Peerasak PAOPRASERT^{1,*}, and Natee SIRISIT^{1,*}

¹ Department of Chemistry, Faculty of Science and Technology, Thammasat University, Pathumthani, 12120 Thailand

² Department of Radiological Technology, Faculty of Medical Technology, Mahidol University, Nakhon Pathom, 73170 Thailand

³ Department of Science, Faculty of Engineering and Science, University of Agder, Kristiansand, Norway

⁴ Department of IT Convergence (Brain Korea PLUS 21), Korea National University of Transportation, Chungju 380-702, South Korea

⁵ Department of Polymer Science and Engineering, Korea National University of Transportation, Chungju 380-702, South Korea

⁶ College of Chemistry and Chemical Engineering, Hunan University, Changsha, Hunan 410082, P. R. China

⁷ College of Aerospace Engineering, Chongqing University, Chongqing 400044, China

⁸ Guangdong Provincial Key Laboratory of Optical Information Materials and Technology, Institute of Electronic Paper Displays, South China Academy of Advanced Optoelectronics, South China Normal University, Guangzhou, 510006, China

⁹ National Center for International Research on Green Optoelectronics, South China Normal University, Guangzhou, 510006, China

¹⁰ Department of Materials and Textile Technology, Faculty of Science and Technology, Thammasat University, Pathumthani, 12120 Thailand

*Corresponding author e-mail: peerasak@tu.ac.th,

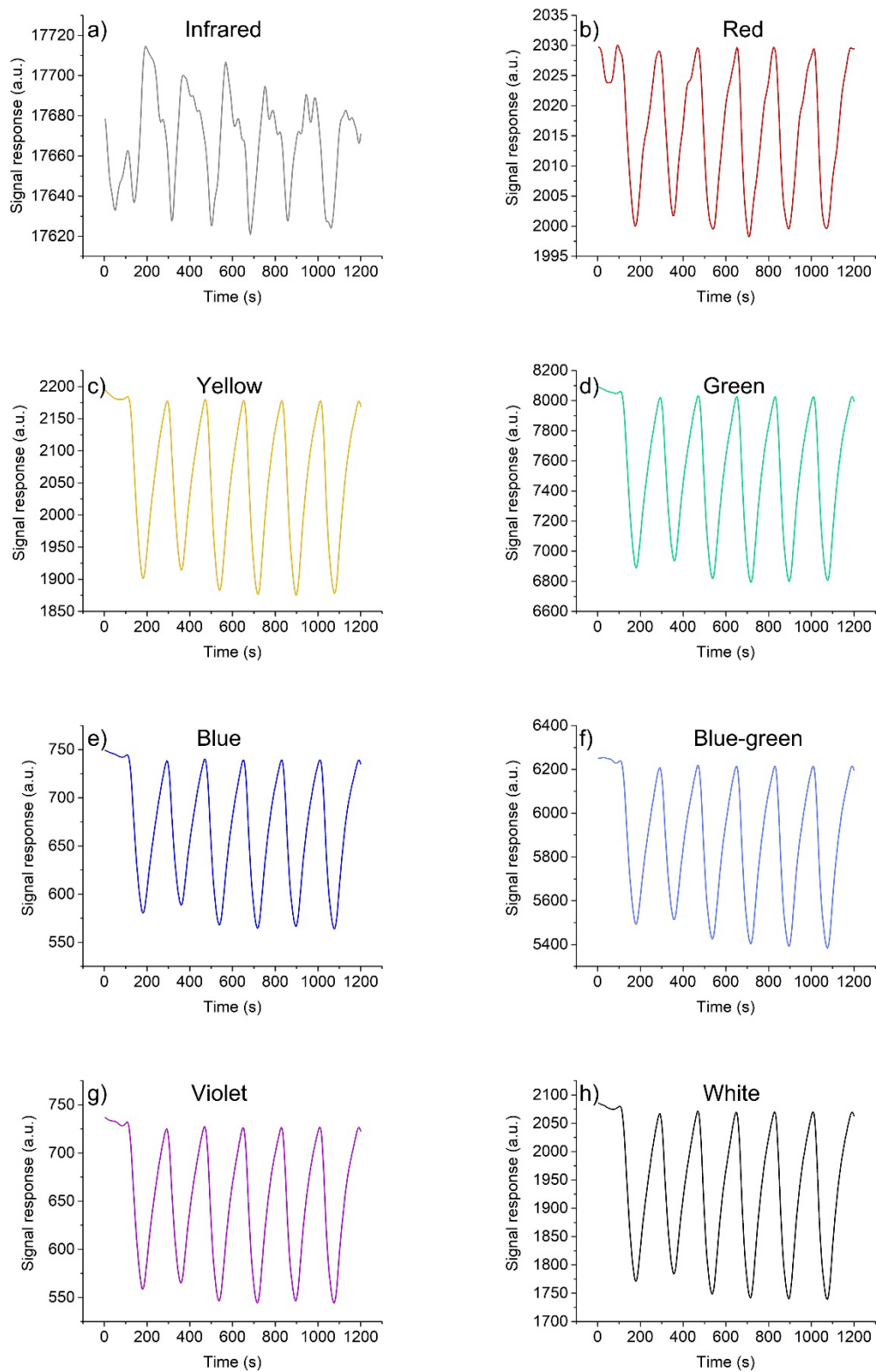


Figure S1. Signal response of the carbon dot film upon exposure formaldehyde vapor under (a) infrared, (b) red (638 nm), (c) yellow (587 nm), (d) green (537 nm), (e) blue (457 nm), (f) blue-green (472 nm), (g) violet (399 nm), and (h) white light sources.

Table S1. Sensitivity of jackfruit seed-derived carbon dot film to acetaldehyde vapor.

No. of cycle	I _{sample}	I _R	Sensitivity value
1	1064.770	1376.990	0.226741
2	1122.902	1383.281	0.188233
3	1099.022	1382.292	0.204928
4	1088.544	1385.544	0.212664
5	1094.062	1385.177	0.210164
6	1101.827	1382.921	0.203261
Average ± S.D.			0.208 ± 0.013

Table S2. Sensitivity of jackfruit seed-derived carbon dot film to formaldehyde vapor.

No. of cycle	I _{sample}	I _R	Sensitivity value
1	580.438	734.798	0.210071
2	588.662	733.479	0.196439
3	568.192	730.050	0.221708
4	565.265	728.750	0.224336
5	567.447	726.720	0.219167
6	564.990	726.230	0.222023
Average ± S.D			0.216 ± 0.011

Table S3. Sensitivity of jackfruit seed-derived carbon dot film to DI water vapor.

No. of cycle	I _{sample}	I _R	Sensitivity value
1	567.552	828.193	0.314710
2	639.234	836.939	0.236224
3	636.493	837.448	0.239961
4	645.786	837.886	0.229267
5	646.512	836.972	0.227558
6	648.988	839.047	0.226518
Average ± S.D			0.246 ± 0.034