

Supporting Information for

**Portable Agrichemical Detection System for Enhancing the Safety of
Agricultural Products using Aggregation of Gold Nanoparticle**

Seung Hoon Baek,[†] Seung Woo Lee,[†] Eun Ju Kim,[†] Dong-Hyuk Shin,[‡] Seog-Won Lee,[‡] and Tae
Jung Park^{†,*}

[†]Department of Chemistry, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul 06974,
Republic of Korea

[‡]Well Korea Corporation, 44 Techno 11-ro, Yuseong-gu, Daejeon 34036, Republic of Korea

Corresponding Author

*To whom correspondence should be addressed: tjpark@cau.ac.kr (T.J.P.)

Author Emails

Seung Hoon Baek : cutey1221@naver.com

Seung Woo Lee : swish0507@naver.com

Eun Ju Kim : kej4684@naver.com

Dong-Hyuk Shin : sdhhanbit@hanmail.net

Seog-Won Lee : wellkorea@hotmail.com

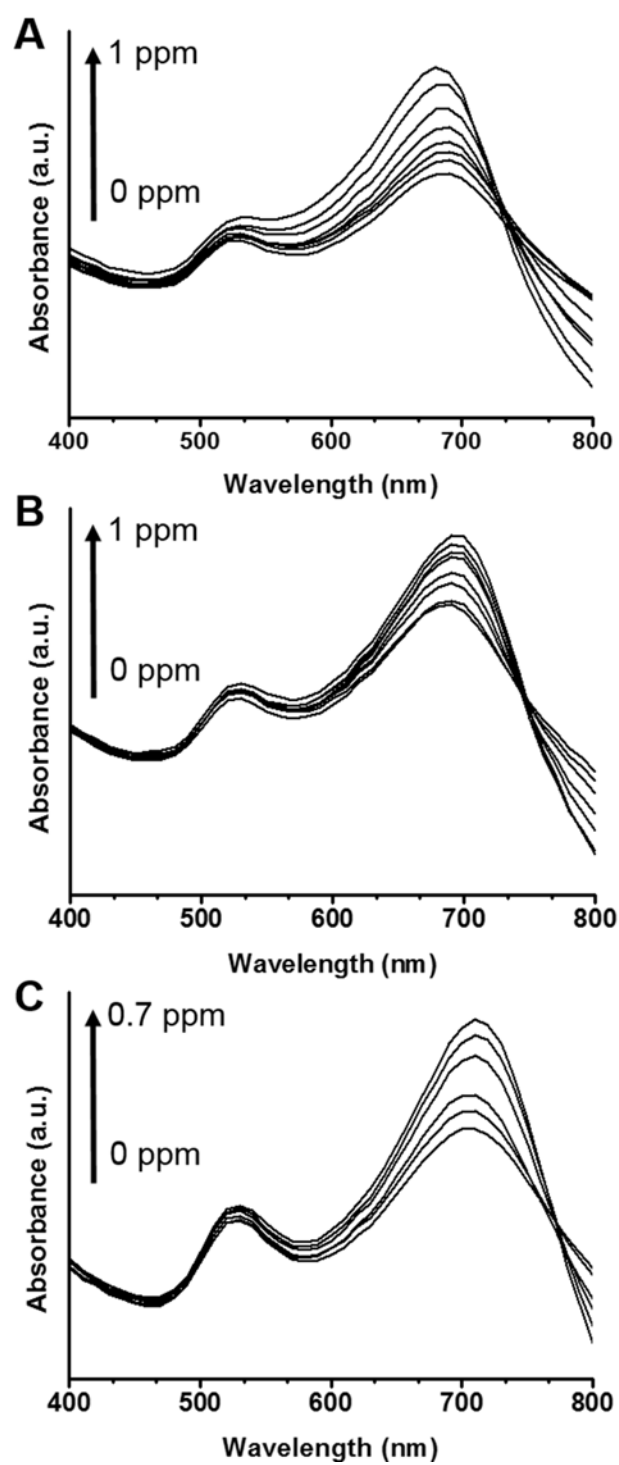


Figure S1. Sensitivity of the assay for detecting agrichemicals. The changes in absorbance with increasing concentrations of diazinon (A), edifenphos (B) and iprobenphos (C).



Figure S2. The appearance and mechanical drawing of designed portable device which has absorbance analysis system at particular wavelength.

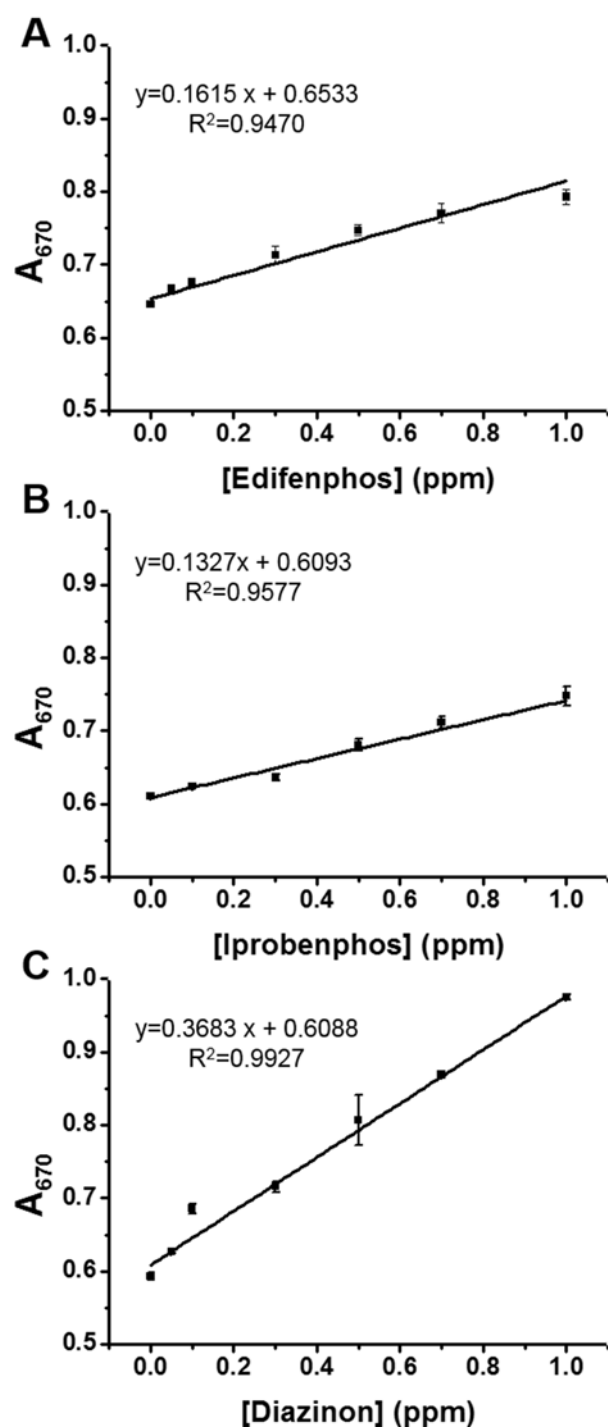


Figure S3. Plots of the absorbance value at 670 nm wavelength (A_{670}) versus the concentrations of edifenphos (A), iprobenphos (B), and diazinon (C). All of absorbance values were calculated by the device in this study.

Table S1. Analytical Results of the Determination of Diazinon Compound Using the Proposed Optical Sensor Device and HPLC

Samples	Diazinon Conc. (ppm)	The present method mean $\pm$ SD (ppm)*	Recovery (%)	HPLC Mean $\pm$ SD (ppm)*	Recovery (%)
1	0.05	0.049 $\pm$ 0.017	98.8	0.046 $\pm$ 0.001	92.0
2	0.08	0.074 $\pm$ 0.024	92.3	0.077 $\pm$ 0.001	96.3
3	0.15	0.166 $\pm$ 0.017	110.6	0.149 $\pm$ 0.001	99.3
4	0.25	0.258 $\pm$ 0.006	103.8	0.244 $\pm$ 0.001	97.6
5	0.50	0.524 $\pm$ 0.017	104.8	0.454 $\pm$ 0.001	90.8

*The standard deviations (SD) of measurements are calculated from three independent experiments.

Table S2. Analytical Results of the Determination of Iprobenfos Compound Using the Proposed Optical Sensor Device and HPLC

Samples	Iprobenfos Conc. (ppm)	The present method mean $\pm$ SD (ppm)*	Recovery (%)	HPLC mean $\pm$ SD (ppm)*	Recovery (%)
1	0.05	0.035 $\pm$ 0.031	70.0	0.059 $\pm$ 0.001	118.0
2	0.08	0.058 $\pm$ 0.007	72.5	0.094 $\pm$ 0.009	117.5
3	0.15	0.128 $\pm$ 0.020	85.3	0.164 $\pm$ 0.001	109.3
4	0.25	0.261 $\pm$ 0.053	104.4	0.261 $\pm$ 0.001	104.4
5	0.50	0.495 $\pm$ 0.023	99.0	0.507 $\pm$ 0.001	101.4

*The standard deviations (SD) of measurements are calculated from three independent experiments.

Table S3. Analytical Results of the Determination of Edifenphos Compound Using the Proposed Optical Sensor Device and HPLC

Samples	Edifenphos Conc. (ppm)	The present method mean $\pm$ SD (ppm)*	Recovery (%)	HPLC mean $\pm$ SD (ppm)*	Recovery (%)
1	0.05	0.047 $\pm$ 0.007	94.0	0.055 $\pm$ 0.001	110.0
2	0.08	0.078 $\pm$ 0.007	97.5	0.085 $\pm$ 0.001	106.2
3	0.15	0.140 $\pm$ 0.025	93.3	0.154 $\pm$ 0.001	102.6
4	0.25	0.258 $\pm$ 0.019	103.2	0.254 $\pm$ 0.001	101.6
5	0.50	0.518 $\pm$ 0.087	103.6	0.510 $\pm$ 0.001	102.0

*The standard deviations (SD) of measurements are calculated from three independent experiments.