

Supporting Information

**Detection and discrimination of sulfur dioxide using a  
colorimetric sensor array**

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Table S1. Composition of the developed 1 × 6 array

1	Sulfur dioxide kit(Based on the principle of hydrochloric para-rosaniline)
2	80µg/mL Brilliant Green in 10mM PBS(pH=7)
3	46.34µg/mL Malachite Green in 10mM PBS(pH=7)
4	55µg/mL Basic Fuchsin in 1.47mM Borax buffer solution(pH=9.16)
5	1.34×10 <sup>-2</sup> µg/mL o-Phthalaldehyde + 3.85×10 <sup>-3</sup> µg/mL ammonium acetate in 4mM potassium dihydrogen phosphate buffer (pH=6.6)
6	3.6×10 <sup>-3</sup> µg/mL 1,10-Phenanthroline,3.24×10 <sup>-3</sup> µg/mL Iron(III) chloride + CTAB(0.5%) in 0.5Mm Sodium acetate anhydrous solution(pH=5.5)

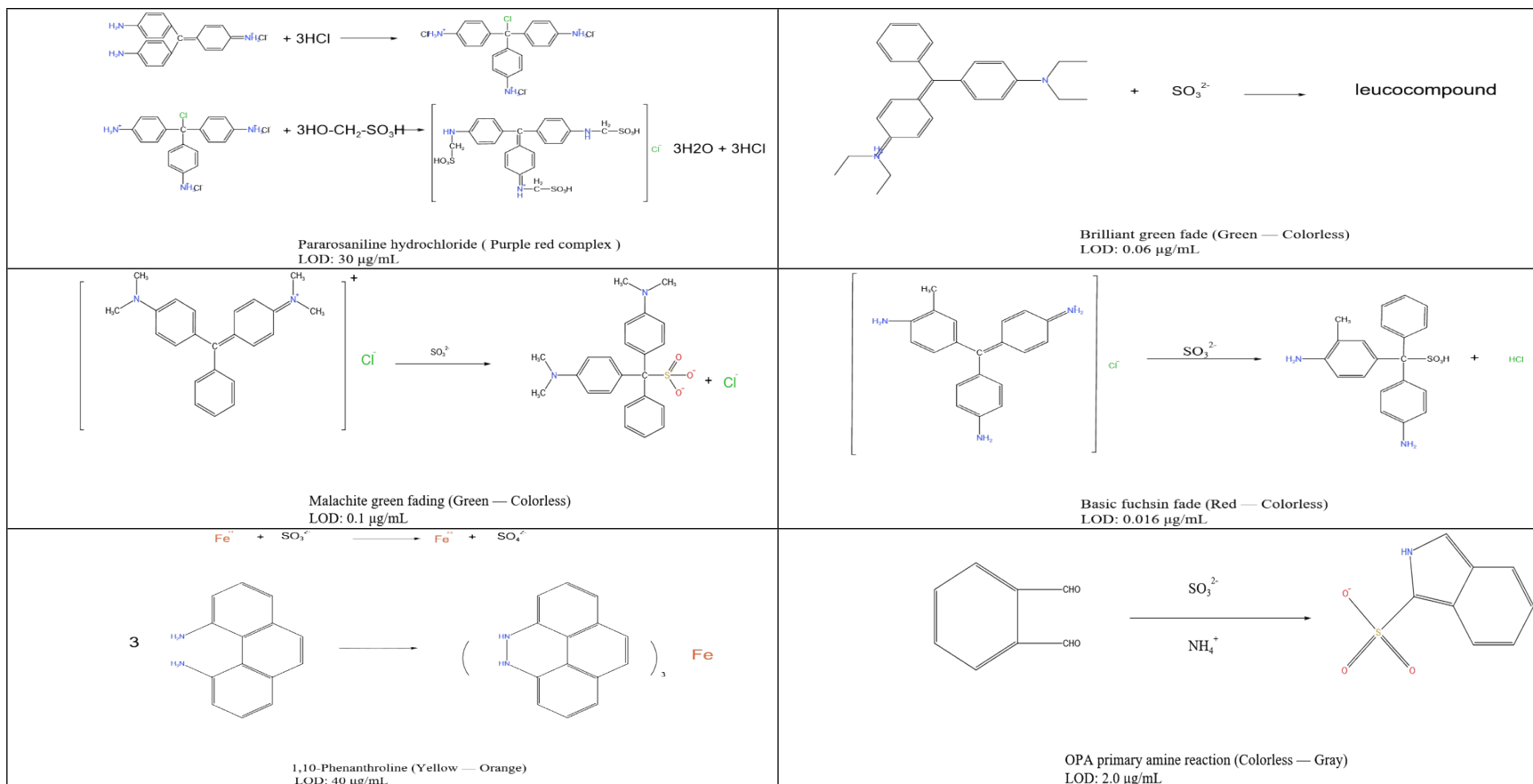


Figure S1. Principle of specific reaction with sulfur dioxide and limits of detection of six prepared dyes based on spectrophotometry.

Note: The above six reactions are based on the specific color reaction with sulfite.

Table S2. Comparison of detection limits of sulfur dioxide by different common methods

Methods	LOD ( $\mu\text{g/mL}$ )	References
Spectrophotometry	4.0	Ref [15]
Acid-base titration	1.50	Ref [16]
Fluorescence method	$6.29 \times 10^{-3}$	Ref [17, 18]
Gas chromatography-mass spectrometry	$1.5 \times 10^{-3}$	Ref [19]
High-performance liquid chromatography	0.30	Ref [20]
Electrochemical analysis	0.40	Ref [21]
Enzyme-linked immunosorbent assays	0.46	Ref [22]
Fourier-transform infrared spectroscopy	0.80	Ref [23]
Colorimetric sensor array	0.406	

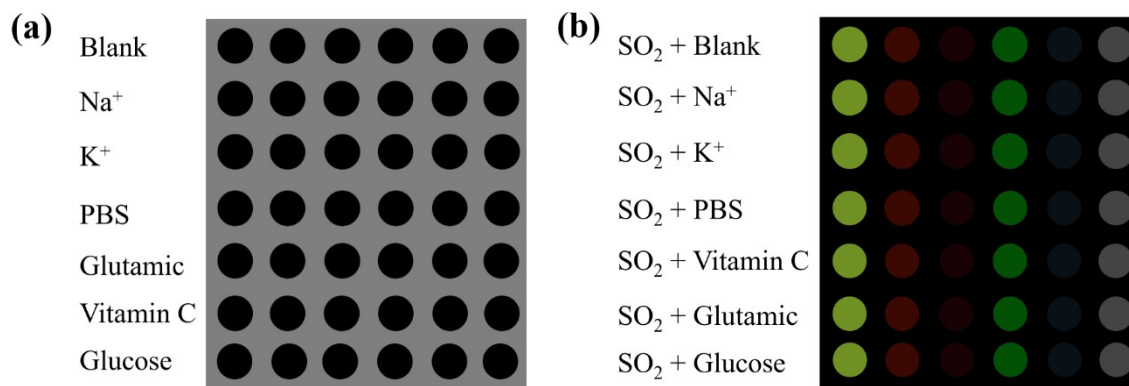


Figure S2. Color difference maps of different interferents with and without sulfur dioxide. (a) Difference maps of different interferents with final concentration of 100 µg/mL. (b) Difference maps of different interferents with final concentration of 100 µg/mL and sulfur dioxide with final concentration of 10 µg/mL.

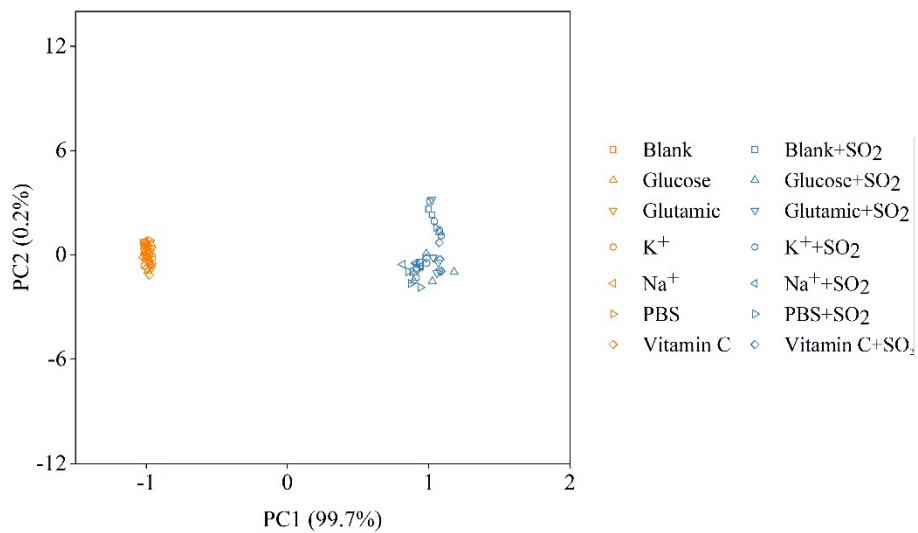


Figure S3. A PCA plot of different interferents with and without sulfur dioxide.

Note: interferents (e.g., Blank, Na<sup>+</sup>, K<sup>+</sup>, PBS, vitamin C, glutamic acid, glucose, final concentration 100 µg /mL), sulfur dioxide (final concentration 100 µg/mL). All of the experiments were performed in quintuplicate.

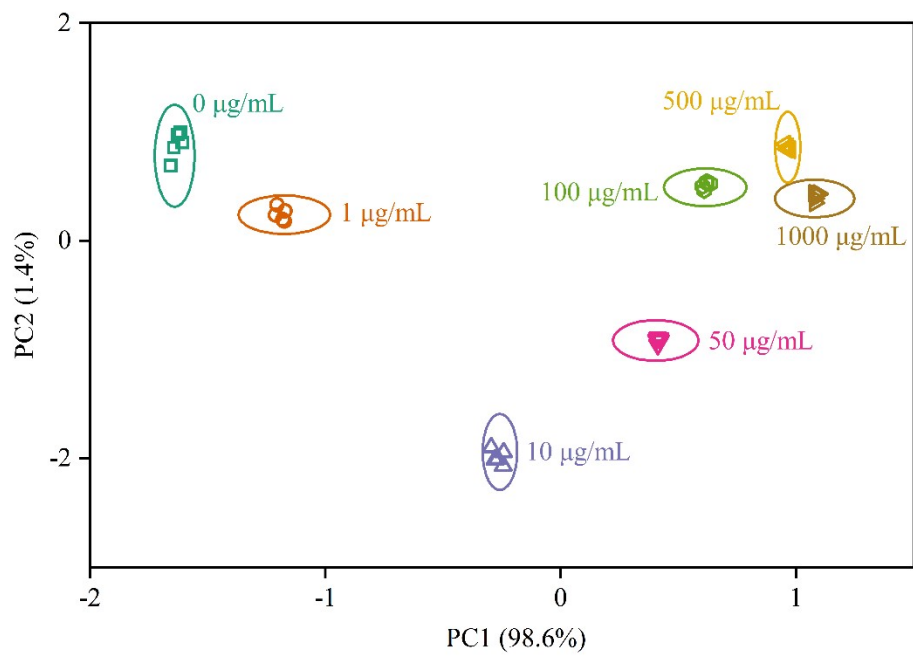


Figure S4. A PCA diagram of sulfur dioxide with different concentrations. All of the experiments were performed in quintuplicate.



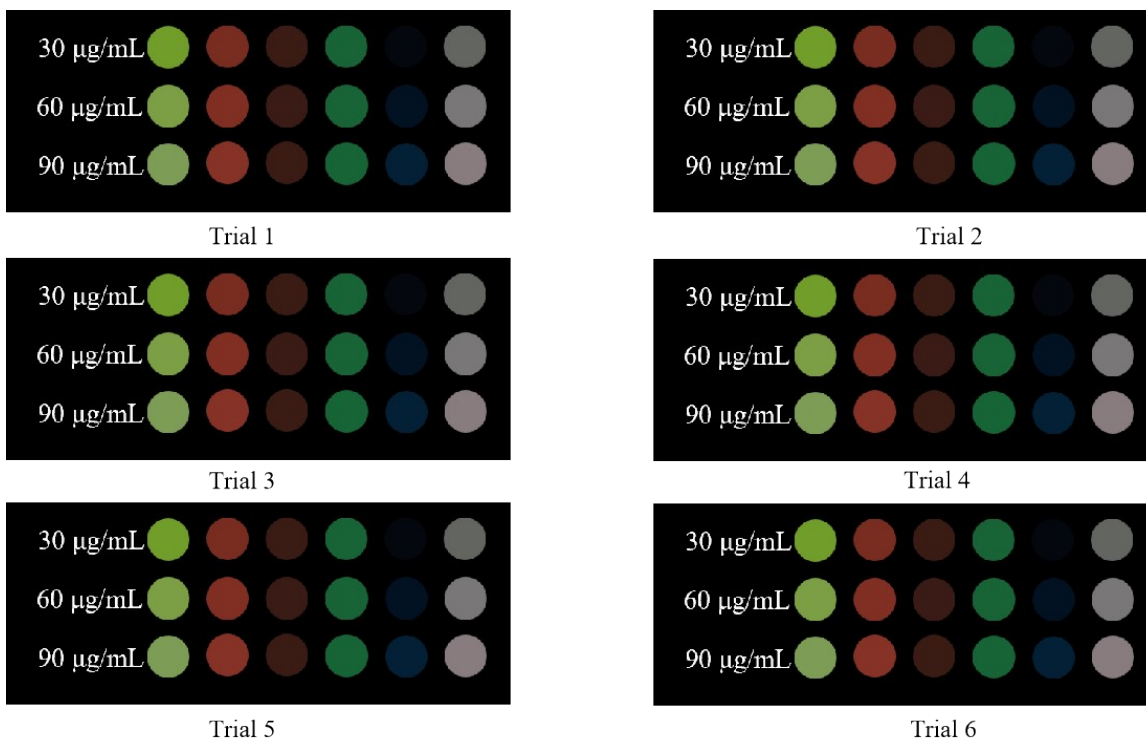


Figure S5. Difference maps of *fritillaria* samples with different concentrations of sulfur dioxide. All of the experiments were performed in sextuplicate.