Electronic Supplementary Material (ESI) for Analyst.

SUPPORTING INFORMATION

Photoelectrochemical immunoassay of aflatoxin B_1 in foodstuff based on amorphous TiO_2 and $CsPbBr_3$ perovskite nanocrystals

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S1.1. Calculation Method for t-Test Statistics

To investigate the method accuracy between two methods, statistical comparison based on the experimental results was carried out with an unpaired Student's *t*-test. The statistics for each sample were calculated by using independent two-sample *t*-test with equal sample sizes and equal variance as follows:

$$t = \frac{|\bar{x}_1 - \bar{x}_2|}{S_{x1x2}} \sqrt{\frac{3}{2}}$$

Where

$$S_{x1x2} = \sqrt{\frac{S_{x1}^2 + S_{x2}^2}{2}}$$

The $\bar{x}$, S_x, and n represent the mean, standard deviation and times of parallel detection of the samples (1, 2 mean the data obtained from the proposed method and referenced method), respectively.

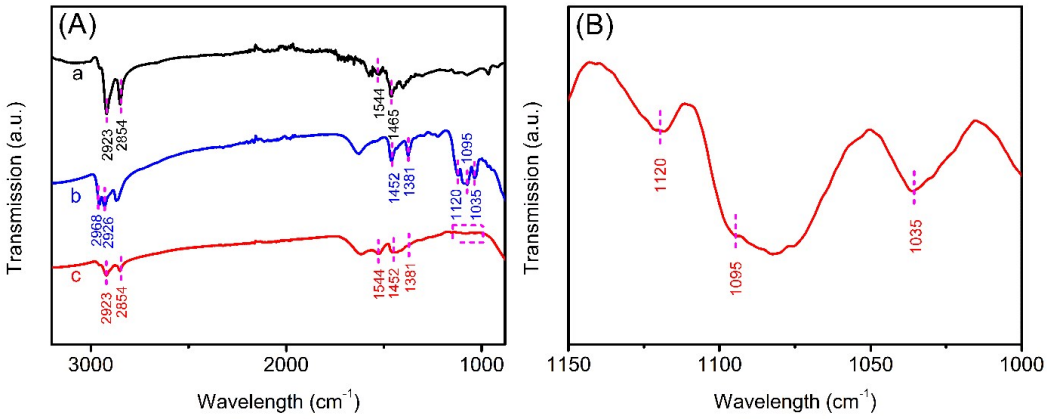

Fig. S1. (A) FTIR spectra of (a) $CsPbBr_3$ nanocrystals, (b) a-TiO_2, and (c) $CsPbBr_3$/a-TiO_2 nanocomposites; (B) the magnified FTIR spectra of $CsPbBr_3$/a-TiO_2 nanocomposites.

As depicted from curve '*a*' in Fig. S1, the peaks at 2923, 2854, and 1465 cm^{-1} could be assigned to the C-H asymmetric stretching vibrations, symmetric stretching vibrations, and in-plane bending vibration, respectively. And the peak at 1544 cm^{-1} could be contributed to the N-H bending vibration, which is a characteristic band for OAm, confirming the presence of OAm. In the case of pure a-TiO_2 (Fig. S1A, curve '*b*'), the bands centered at 1381, 1452, 2926, and 2968 cm^{-1} were attributed to the

bending vibrations of the -CH_3 and -CH_2 groups. And three characteristic absorption peaks in 1035, 1095, and 1120 cm^{-1} were contributed to the Ti-O-C vibration (Fig. S1B). The main peaks were all appeared in the $CsPbBr_3$/a-TiO_2 nanocomposites, preliminarily confirming that the obtained composites contain two fundamental components of $CsPbBr_3$ and a-TiO_2.

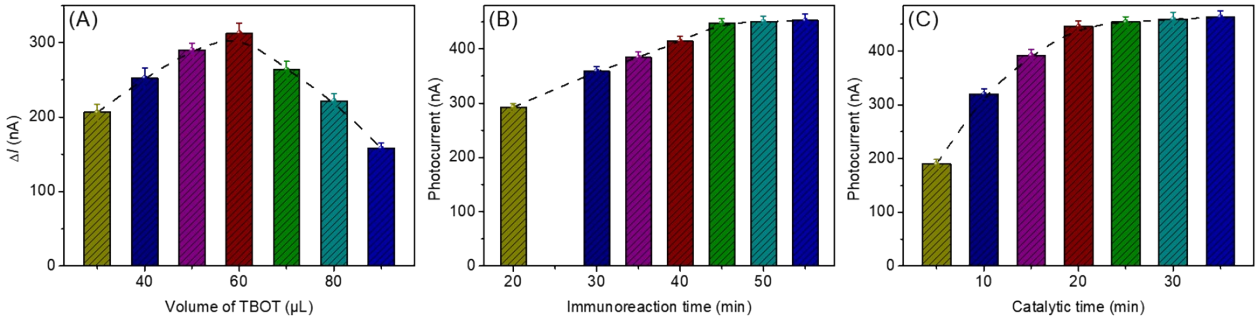

Fig. S2. Effects of (A) volume of TBOT, (B) the competitive immunoreaction time, and (C) the catalytic time (note: 0.1 ng mL^{-1} AFB_1 used in the cases, and the error bars represent the standard deviation of three measurements.).

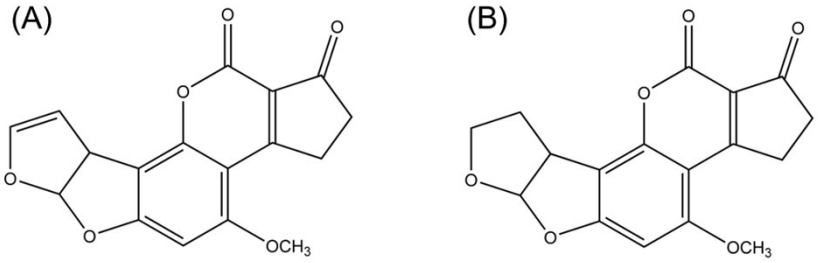

Fig. S3. Structures of (A) AFB_1 and (B) AFB_2.

References

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