

Supplementary Information

A disposable biofilm modified amperometric biosensor for sensitive determination of pesticide biotoxicity in water

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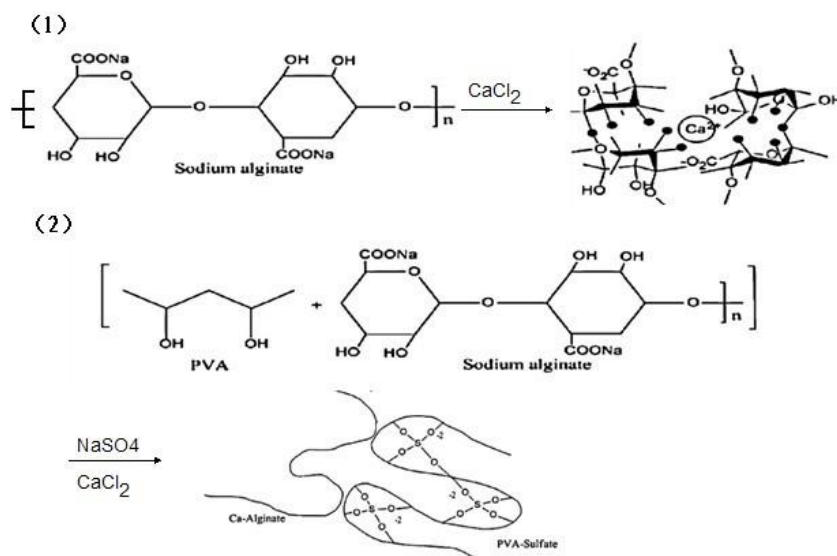


Fig. S1. Schematic diagram of reaction involving PVA, Na alginate, CaCl₂ and Na₂SO₄

Fig. S2. AFM images of *S. cerevisiae* cells pretreated by ethanol with different concentrations. (a) no-treatment, control; (b) 20% (v/v) ethanol, 16 h; (c) 30% (v/v) ethanol, 16 h, the magnified image of Fig. 1 (a); (d) 20% methanol, 16h (e) 40% (v/v) methanol, 16 h; (f) 30% (v/v) methanol, 16 h; respectively.

Fig. S3. (a) The low-magnification SEM image of the PVA biofilm enclosed with the pretreated *S. cerevisiae*; (b) electrodes modified with the PVA biofilm enclosed with *S. cerevisiae* pretreated by 30% ethanol 16h (solid line); electrodes modified with the PVA-Ca alginate biofilm enclosed with *S. cerevisiae* pretreated by 30% ethanol 16h (dash line).

Fig. S4. XRD patterns of dried PVA powder, PVA–sodiumsulfate hydrogel, PVA hydrogel and dried PVA powder.

Fig. S4 shows XRD patterns of dried PVA powder, PVA hydrogel, dried sulfate hydrogel powder and PVA-sodium sulfate hydrogel, respectively. Dried PVA powder had an intense peak at about $2\theta=20^\circ$, which is attributed to diffraction from the (1 0 1) crystal planes of PVA. While the peak was not observed in the XRD pattern of PVA hydrogel, revealing that the PVA hydrogel was not conducive to the crystallization of PVA. However, in the XRD pattern of the PVA-sodium sulfate hydrogel sample, there was also a weak diffraction peak at about $2\theta=20^\circ$.

Fig. S5. (a) Reproducibility of the disposable biofilm microbial biosensors of five replicates and (b) storage stability for one week. Data points in (b) represent the average of three replicates.

Fig. S6. The biotoxicity assay of real wastewater. A: 10 μ L river water sample around suburban farms; B: 10 μ L garbage wastewater sample; C: 10 μ L laboratory wastewater sample; D: 10 μ L electroplating wastewater sample; E: no wastewater sample, control