Supplementary materials

Detection of hidden drugs with a molecularly imprinted electrochemiluminescence sensor

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1 Sampling procedure

Fig. S1 schematically illustrates the sampling process. A glass vial containing 20 mg MA was placed in a conical glass flask (500 mL) for a predetermined storage time. To test the feasibility of hidden drug detection, the drug containing glass vial was left open or tightly closed with a screw cap or doubly sealed by enclosure of the caped vial in a self-sealed plastic bag. The experiment was carried out in a cold room (5-10ºC), and the temperature of the conical glass flask was controlled by submerging it in a thermostat water bath. A U-shape absorption tube containing 25 mL of 0.1 M PBS (pH 8.0) was used to trap the odorants in the air. When the gas pump is turn on, the odorants of MA will be carried by the incoming air to pass through the PBS. This solution was then subjected for the MA detection by the MIPs-ECL sensor.

The effects of different sampling conditions, including temperature, gas flow rate, sampling time and storage time, were investigated. The flow rate of gas sampling affects the absorption of analyte by the PBS solution. The different flow rates in the range of 0.2 - 1.5 L/min were compared and it was found that a gas flow rate at 1.0 L/min was optimum for the sake of completeness of analyte absorption and the rapidness of sampling. At this flow rate, a sampling time of 2 min was appropriate to completely transfer the odorants that were accumulated in the conical flask into the absorption solution. Temperature affects the volatility of MA, and hence the total amount of MA molecules available in the air of the closed vessel. In case of the unsealed MA container, the ECL signals increased expectedly

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with the increase of temperature. In case of the sealed container, no MA was detected at 15°C, presumably due to the low volatility at low temperature. With the increase of temperature and storage time, however, the detection of MA was achieved even with doubly sealed container (data are given in the Table 1 of the main manuscript).

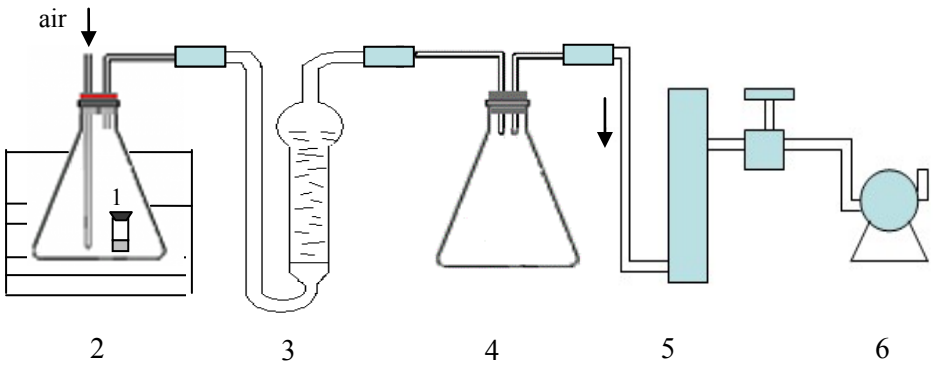

Fig. S1. Schematic illustration of the sampling process. 1 sample vial; 2 Conical flask in a thermostat water bath; 3 U-shaped absorption tube; 4 suck-back prevention bottle; 5 gas flowmeter; 6 gas pump.