

## A promising electrochemical sensor based on PVP-induced shape control of hydrothermal synthesizing layered structured vanadium disulfide for the sensitive detection of sulfamethoxazole antibiotic

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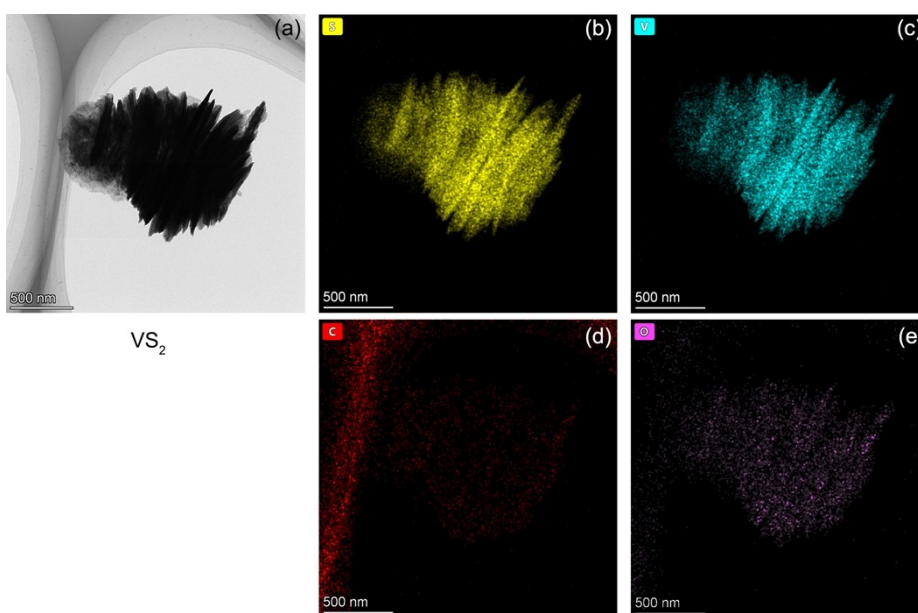


Fig. S1. (a) TEM image of  $\text{VS}_2$ . (b-d) TEM elemental mapping of S, V, C and O.

Table S1. The element composition of VS<sub>2</sub>.

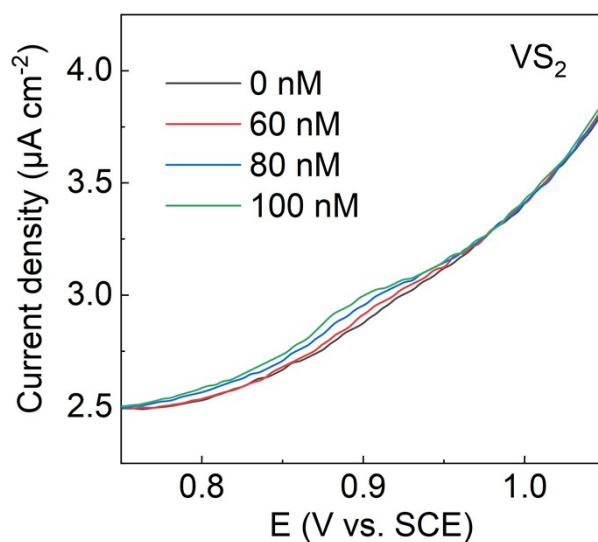
Element	Atomic fraction (%)	Mass fraction (%)
S	67.90	59.66
V	27.66	38.62
C	2.02	0.66
O	2.41	1.06

The parameters  $R_s$ ,  $R_c$ ,  $Q_{dl}$ ,  $Q_c$ , and  $Z_W$  represent solution resistance, internal resistance, interface double layer capacitance, coating capacitance, and Warburg impedance, respectively. The parameter fitting values of the equivalent circuit model are shown in Table S2.

Table S2. The fitting parameters of Nyquist plots for various modified electrodes

Electrodes	$R_s$ ( $\Omega$ )	$\gamma_0, Q_{dl}$ ( $S \cdot sec^n \cdot 10^{-6}$ )	n	$R_{ct}$ ( $\Omega$ )	$\gamma_0, Q_c$ ( $S \cdot sec^n \cdot 10^{-3}$ )	n	$R_c$ ( $\Omega$ )	$\gamma_0, Z_W$ ( $S \cdot sec^5 \cdot 10^{-8}$ )
*GCE	179.0	2.9	0.9	5079	-	-	-	36000
rGO	181.9	337.0	0.8	621.5	5.1	1.0	254.8	45530
CNTs	162.6	3.3	0.8	628.3	1.8	0.4	954.8	5.0
VS <sub>2</sub>	159.6	5.0	0.8	567.2	3.0	0.5	1839	2.3

\* Equivalent circuit model of GCE is fitted as  $R_s(Q_{dl}(R_{ct}Z_W))$ .

Fig. S2. DPV tests of VS<sub>2</sub> electrodes with SMX concentrations as 0, 60, 80 and 100 nM.

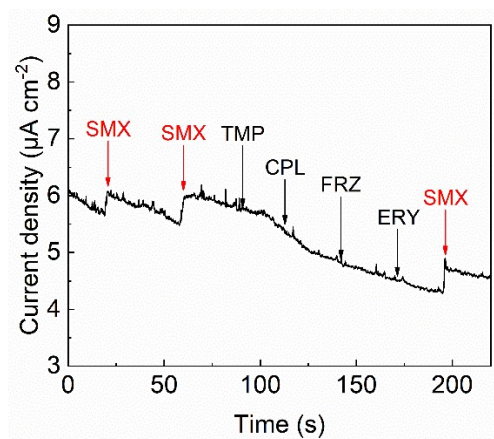


Fig. S3. The anti-interference of VS<sub>2</sub> electrodes towards other types of antibiotics existed in real water samples.

Table S3. Recovery results of CIP in real water samples by using rGO/PEI/TiO<sub>2</sub>/Apt electrodes

Sample	Added (µM)	Founded (µM)	RSD (%)	Recovery (%)
River water	0.6	0.64	1.32	106.77
	1.5	1.58	1.67	105.58
	3	3.15	1.56	105.09
	4.5	4.49	1.79	99.74
	6	5.84	1.16	97.41