Investigation of $Mo_2Ti_2C_3T_x$ MXene in electrochemical immunosensor for respiratory syncytial virus (RSV) detection

Suppoting information:

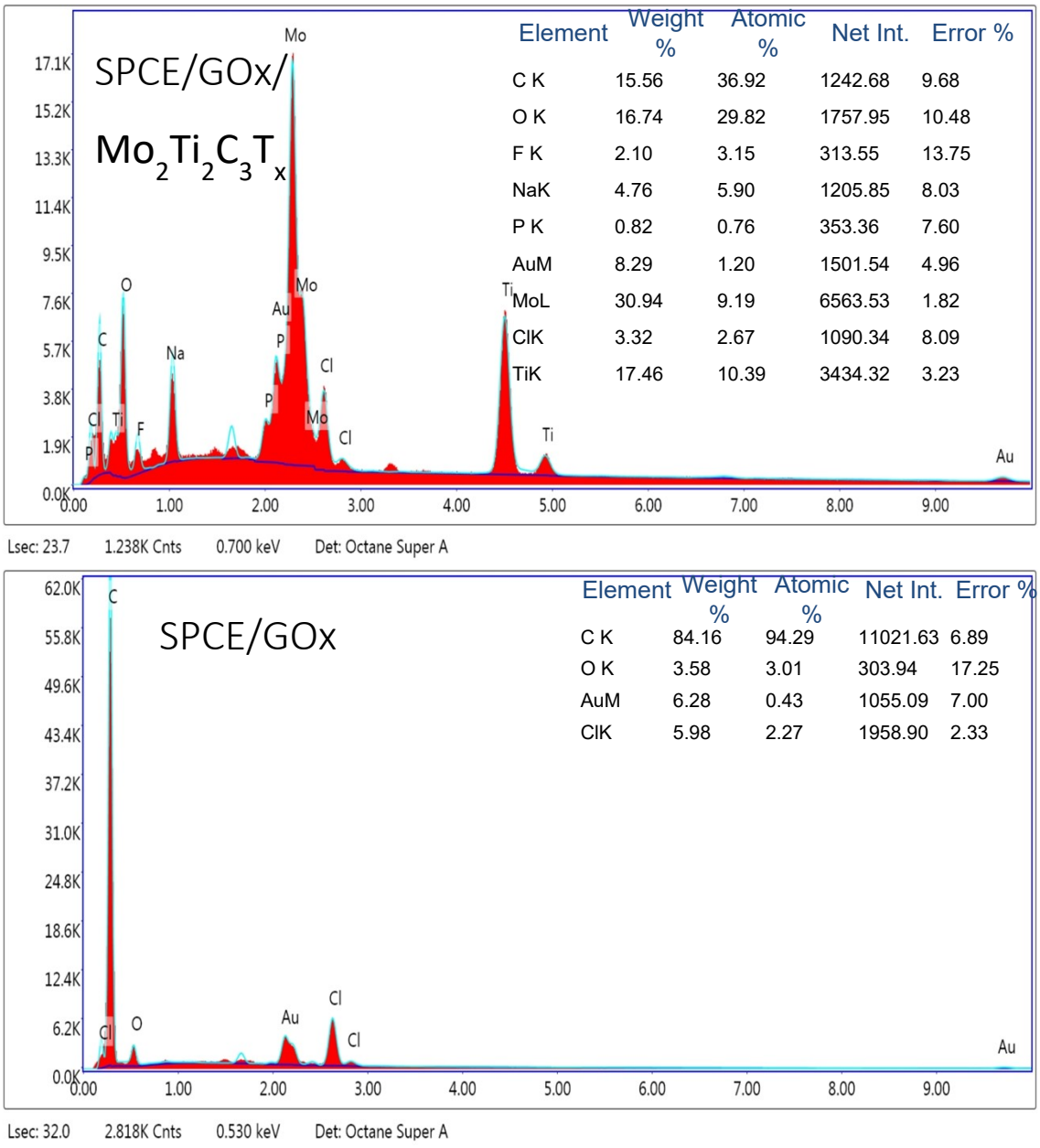

Figure S.1: Elemental mapping images of the SPCE/GOx before and after addition of $Mo_2Ti_2C_3T_x$.

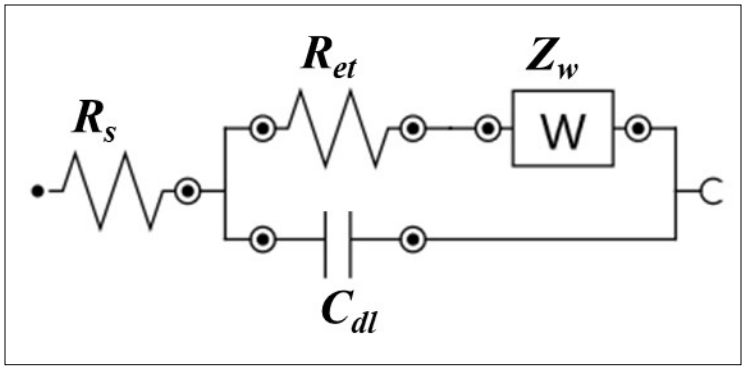

Figure S.2: Randles and Ershler equivalent circuit used for impedance spectra fitting.

Table S.1: Comparison of some biosensors reported for RSV and other respiratory viruses determination.

Target	Technique	Detection method	Linear range	LOD	Ref
RSV	4-aminothiophenol/gluteraldehyde/ glassy carbon electrode/immunosensor	Electrochemical impedance spectroscopy	1.0 x 10^5 PFU/mL to 1.5x10^7 PFU/mL	2.85×10^6 PFU/mL	[1]
RSV	Poly-L-lysine/gold electrode/ immunosensor	Electrochemical impedance spectroscopy	1.0 x10^5 PFU/mL to 1.0 x 10^7 PFU/mL	1.1 × 10^3 PFU/mL	[1]
RSV	Gene biosensor	Surface plasmon resonance	1 nM-1 µM	3 nM	[2]
RSV	Gold nanoparticles based immunoassay	Colorimetric	0.5-20 pg/mL	0.01 pg/mL	[3]
SARS-CoV-2 Nucleocapsid and Spike proteins	Plasmonic nanostructure-immunosensor	SERS	0.1 pg/ mL-1 mg/mL and 1 fg/mL-1 mg/mL	0.1 pg/ mL and 1 fg/mL	[4]
SARS-CoV-2	Moleuclarly-imprinted polymer nanoparticles	SPR	(0.25–1.75) × 10^6 particles/mL	(0.1-3.61)×10^5 particles/mL	[5]
SARS-CoV-	double-π structure aptasensor	SERS	1 fg/mL to 1 ng/mL	0.16 and 0.1 fg/mL	[6]

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RSV	GOx/ $Mo_2Ti_2C_3T_x$ MXene / /SPCEs immunosensor	Square wave voltammetry	0.01 pg/mL-10 µg/mL	0.015 pg/mL	This work

SERS: surface-enhanced Raman scattering

SPR: Surface plasmon resonance

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2. Shi, L., et al., *Development of SPR biosensor for simultaneous detection of multiplex respiratory viruses.* Bio-medical materials and engineering, 2015. **26**(s1): p. S2207-S2216.
3. Zhan, L., et al., *Sensitive immunosensor for respiratory syncytial virus based on dual signal amplification of gold nanopaticle layer-modified plates and catalyzed reporter deposition.* Sensors and Actuators B: Chemical, 2018. **255**: p. 1291-1297.
4. Yeh, Y.-J., et al., *Plasmonic nanostructure-enhanced Raman scattering for detection of SARS-CoV-2 nucleocapsid protein and spike protein variants.* Analytica chimica acta, 2023. **1239**: p. 340651.
5. Bajaj, A., et al., *Synthesis of molecularly imprinted polymer nanoparticles for SARS-CoV-2 virus detection using surface plasmon resonance.* Chemosensors, 2022. **10**(11): p. 459.
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