

Supplementary Material

Redox-State Dependent Spectral Properties of Porous Organic Polymers Containing Furan, Thiophene, and Selenophene

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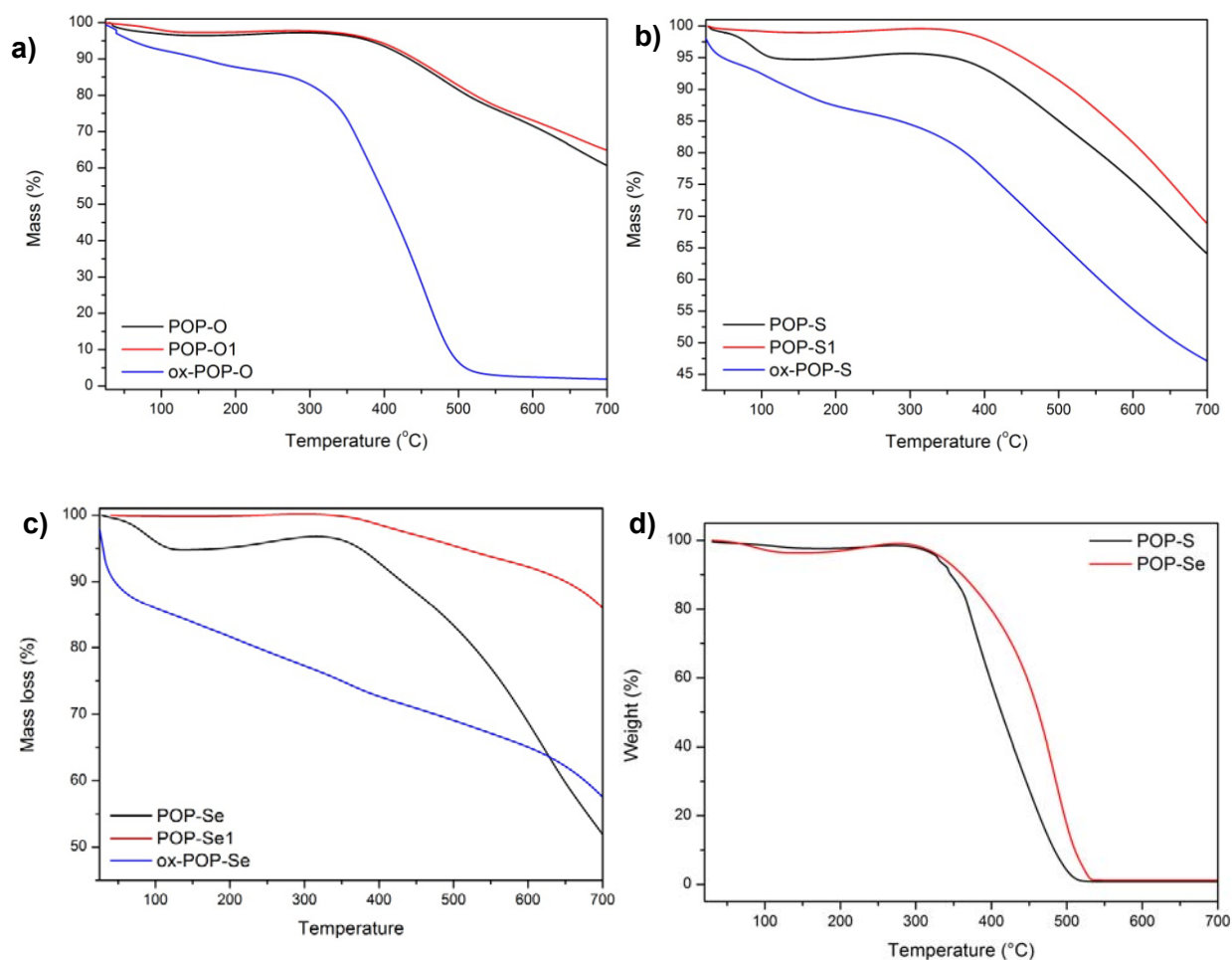


Figure S1. TGA of a) POP-O, POP-O1 and ox-POP-O, b) POP-S, POP-S1, and ox-POP-S, c) POP-Se, POP-Se1, and ox-POP-Se from 25 – 700 °C under nitrogen, d) POP-S and POP-Se measured under air. The origin of the mass increase in POP-S and POP-Se is unknown, but appears regardless of whether the TGA was measured in air or nitrogen.

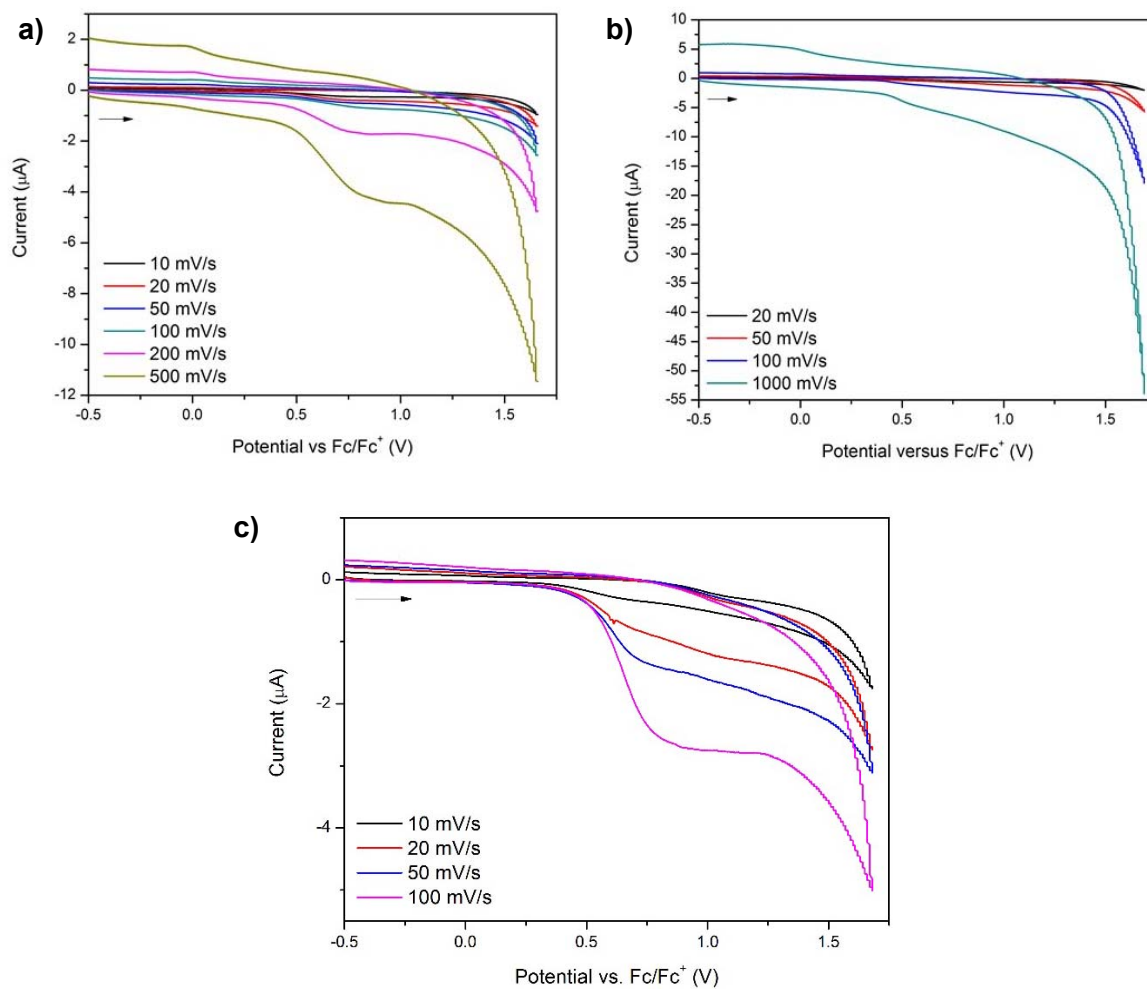


Figure S2. Solid state cyclic voltammograms of a) **POP-O**, b) **POP-S** and c) **POP-Se** in $[(n\text{-C}_4\text{H}_9)_4\text{N}]\text{PF}_6/\text{CH}_3\text{CN}$ electrolyte where the arrow indicates the direction of the forward scan.

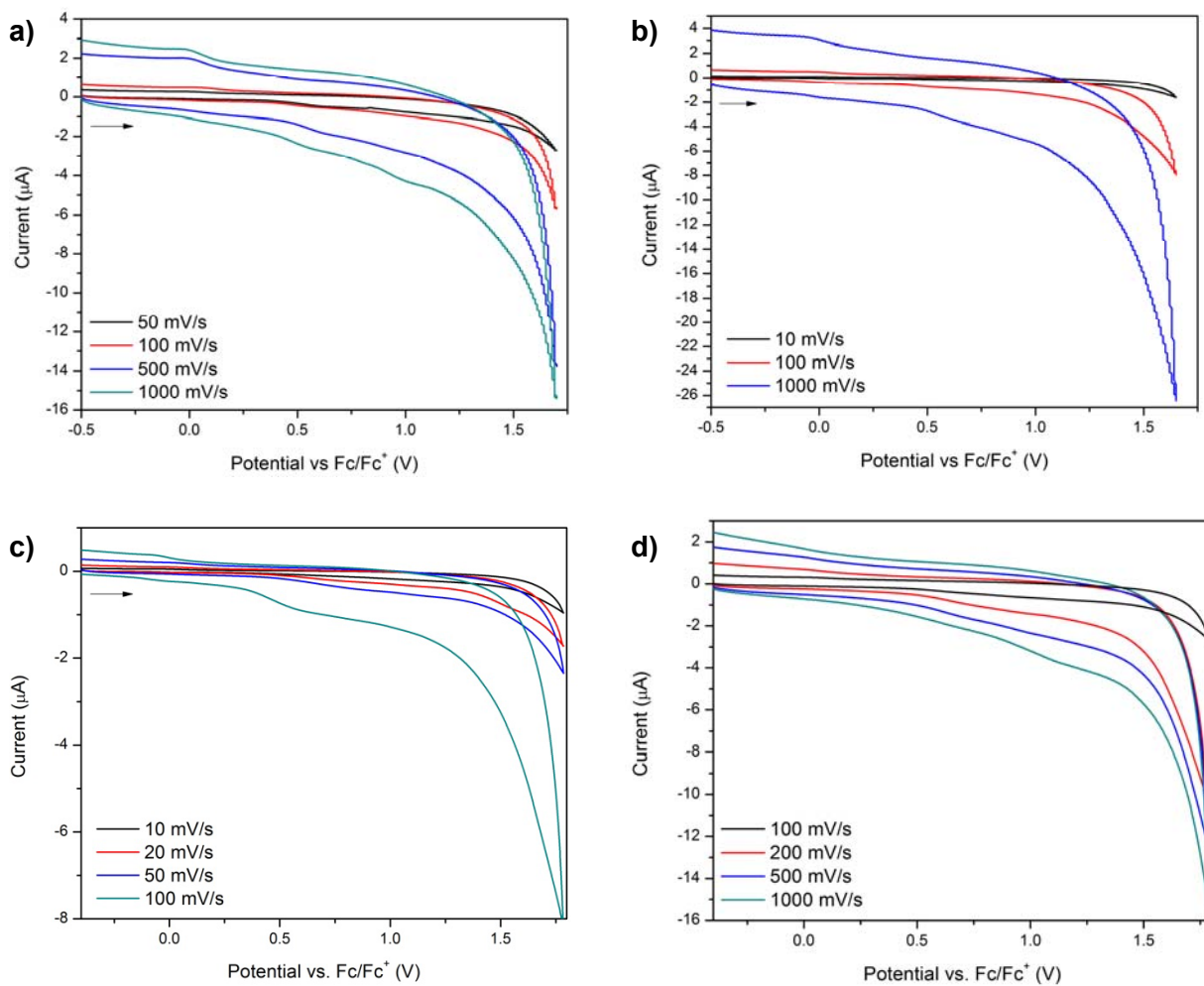


Figure S3. Solid state cyclic voltammograms of a) **POP-O1**, b) **POP-S1** and **POP-Se1** at scan rates of c) 10 – 100 mV/s and d) 100 – 1000 mV/s in $[(n\text{-C}_4\text{H}_9)_4\text{N}]\text{PF}_6/\text{CH}_3\text{CN}$ where the arrow indicates the direction of the forward scan.

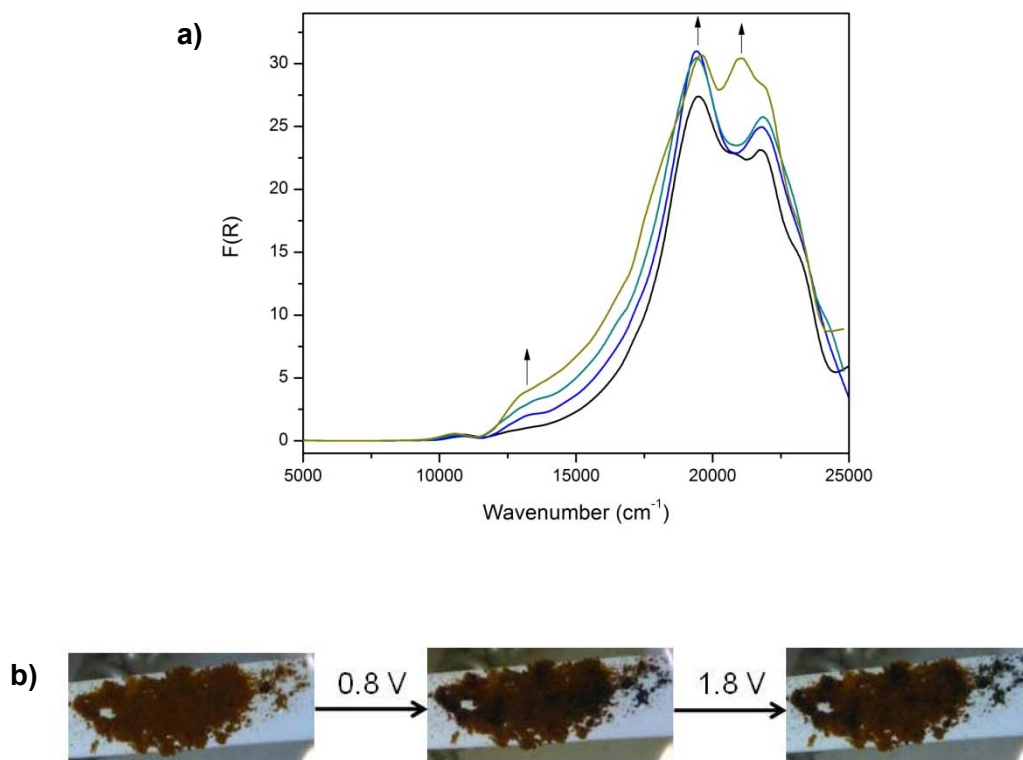


Figure S4. Solid state Vis/NIR spectroelectrochemical experiment in $[(n\text{-C}_4\text{H}_9)_4\text{N}]\text{PF}_6/\text{CH}_3\text{CN}$ electrolyte of **POP-Se** with oxidation from 0-2.5 V a) over the range 5000-25000 cm^{-1} and b) photos of the polymer during the course of the experiment.

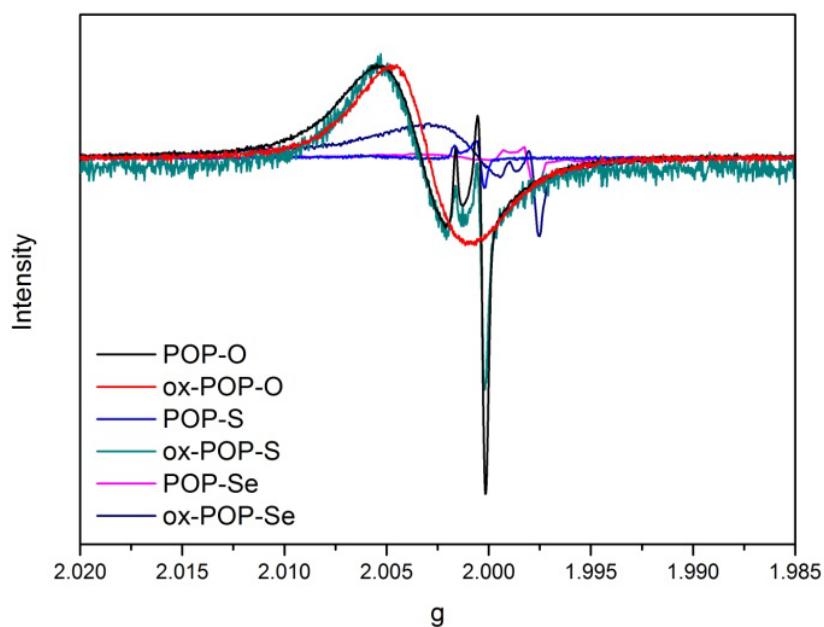


Figure S5. X-band solid-state EPR spectra of the polymers a) **POP-O**, **POP-S**, **POP-Se**, **ox-POP-O**, **ox-POP-S** and **ox-POP-Se** at room temperature at where the sharp peaks 2-2.0025 are due to impurities in the sample tube used.

Table S1. Simulation Parameters for the EPR signal of **POP-S**.

g_{\perp}	2.0068
g_{\parallel}	2.0045
A(mT)	0.1
Line broadening	0.15
Experimental MW phase	$-30 * \pi / 180$

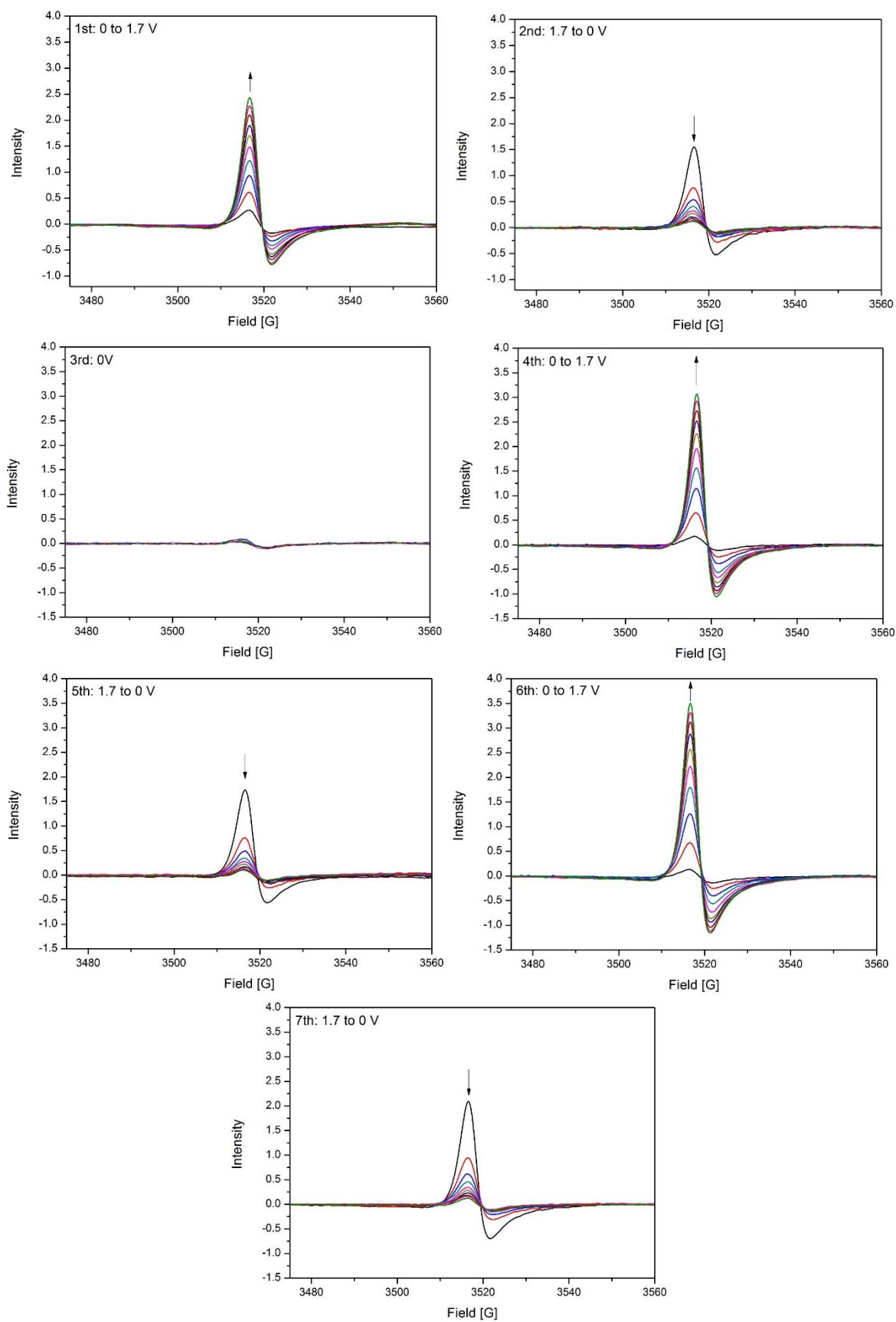


Figure S6. Solid state spectra from the EPR spectroelectrochemical experiment for **POP-S** over three oxidation and reduction cycles in $[(n\text{-C}_4\text{H}_9)_4\text{N}]\text{PF}_6/\text{CH}_3\text{CN}$ electrolyte at X-band at room temperature.

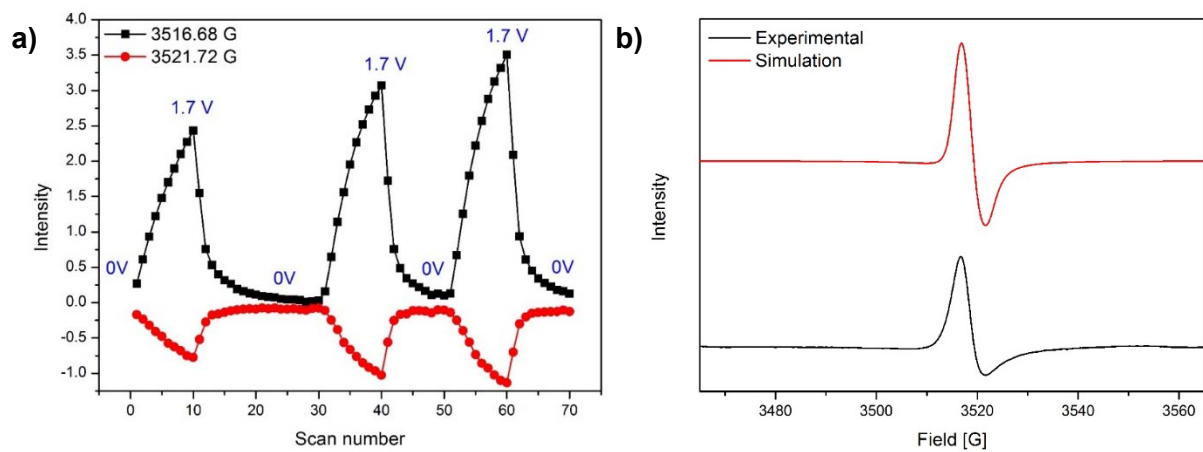


Figure S7. a) Signal intensity as a function of the scan number, with the potential applied indicated for the most positive point of the signal at 3517 G and the most negative point of the signal at 3522 G and b) simulation of the EPR signal.