Supplementary information

a) OCP measurement

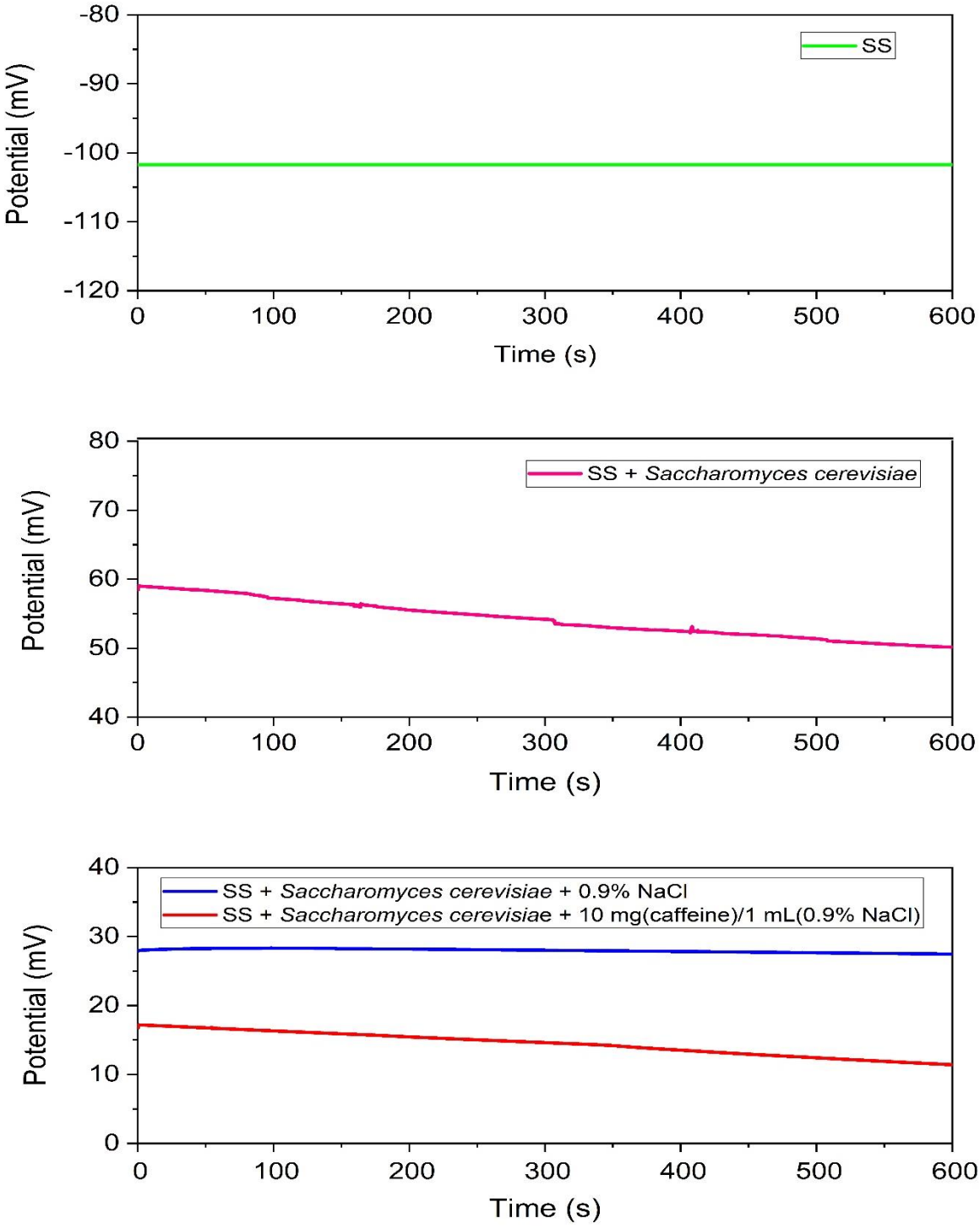

Figure 1S: OCP measurements graphs of the biosensor with bare stainless steel working electrode (SS), *Saccharomyces cerevisiae* on the stainless steel (SS) working electrode, and with the addition of 0.9% NaCl and 10 mg (caffeine)/ 1 mL (0.9% NaCl) to the biosensor containing stainless steel (SS) working electrode and *Saccharomyces cerevisiae* on the electrode surface.

b) Fitted impedance spectrum of the electrochemical cell without a biorecognition element

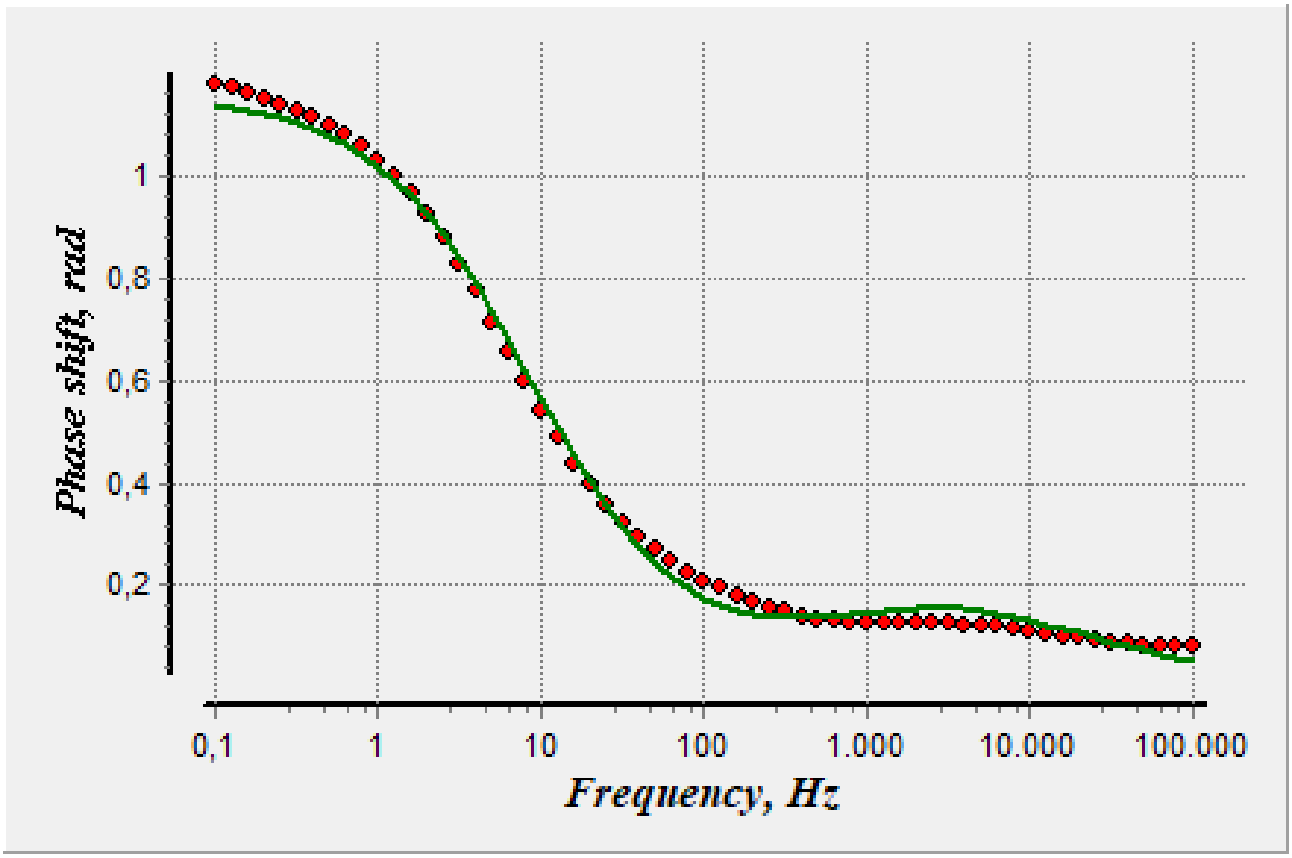

Figure 2S: Fitted impedance spectrum and the equivalent electric circuit of the electrochemical cell without biorecognition element on the working electrode surface.

The impedance spectrum shown in Figure 1S was fitted in EIS Spectrum Analyser with the LevMarq algorithm.

b) Fitted impedance spectrum of the electrochemical cell with a biorecognition element

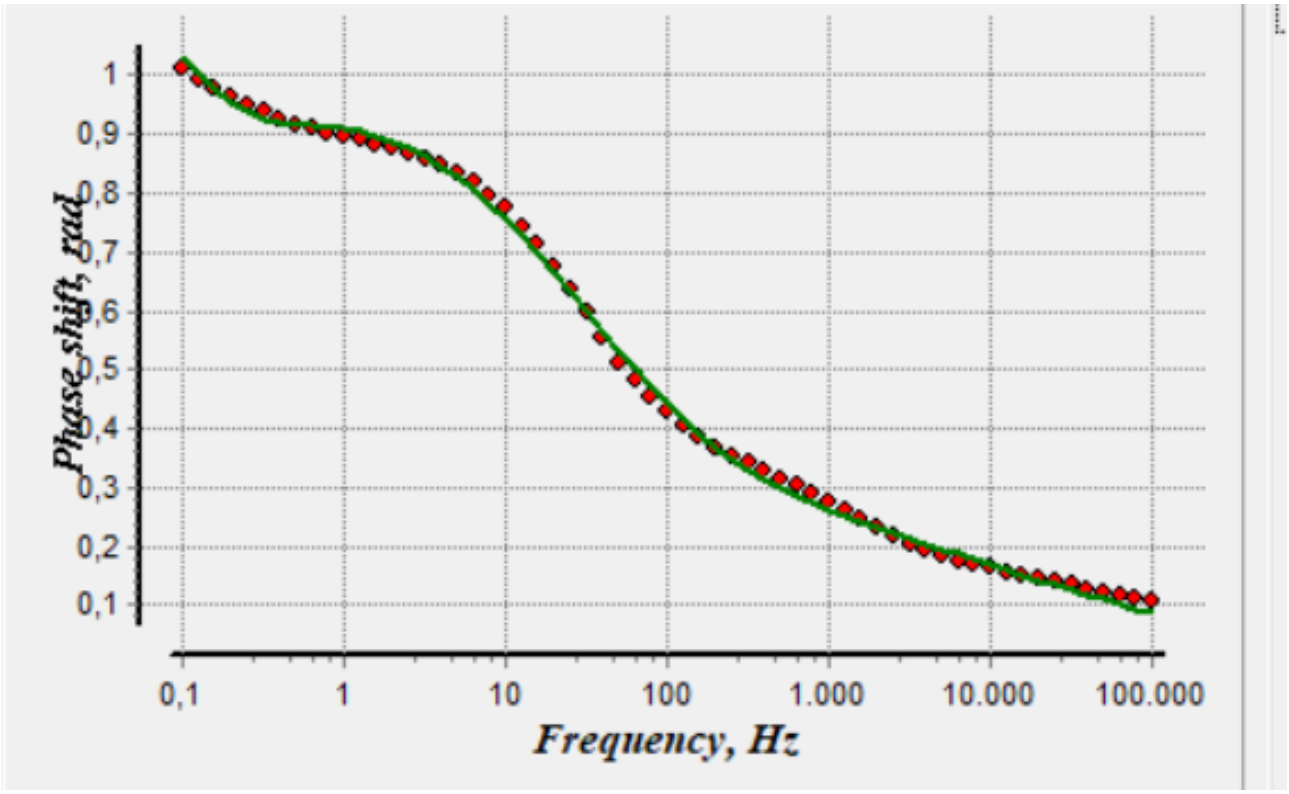

Figure 3S: Fitted impedance spectrum and the equivalent electric circuit of the electrochemical cell with Saccharomyces cerevisiae as biorecognition element

The fitted impedance spectrum shown in Figure 2S was fitted in EIS Spectrum Analyser with the LevMarq algorithm.