An Investigative Study of Electrochemical Induced Fluorescence for Fluorophores

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Supplementary Information

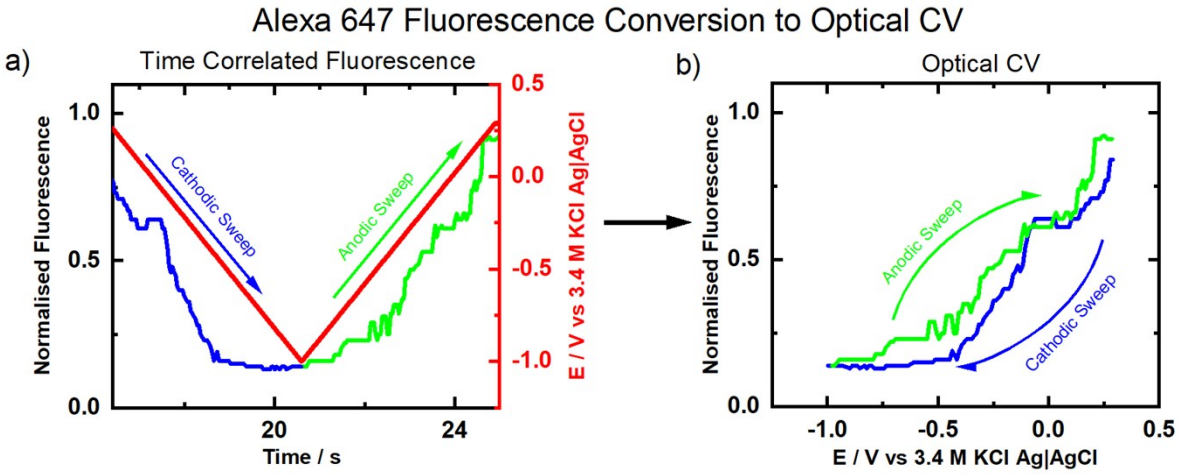


Figure S1: Optical CV creation. ITO|PLL exposed to 10^{-4} mg mL^{-1} Alexa 647. Buffer is 1X Dulbecco's phosphate buffered saline pH 7.4. a) time correlated fluorescence with the fluorescence and potential presented on a time x-axis. b) optical CV with the time x-axis is converted into potential.

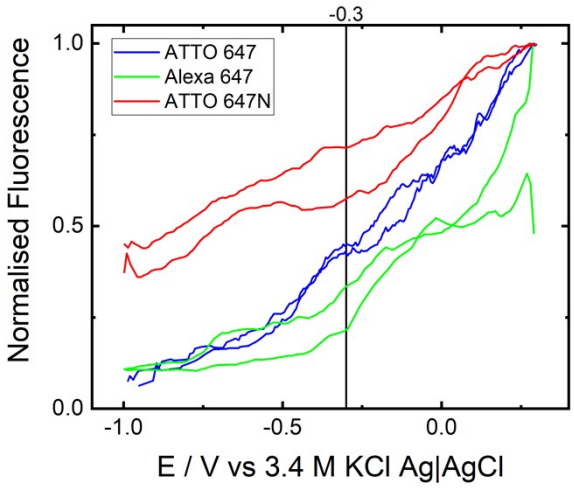


Figure S2: Optical cyclic voltammetry of a singular localised fluorophore of ATTO 647 (blue), Alexa 647 (green), and ATTO 647N (red) in 1X Dulbecco's phosphate buffered saline pH 7.4. Cyclic voltammetry is set to scan between -1 V and 0.3 V at a scan rate of 150 mV s^{-1}. The normalised fluorescence is from a single fluorophore.

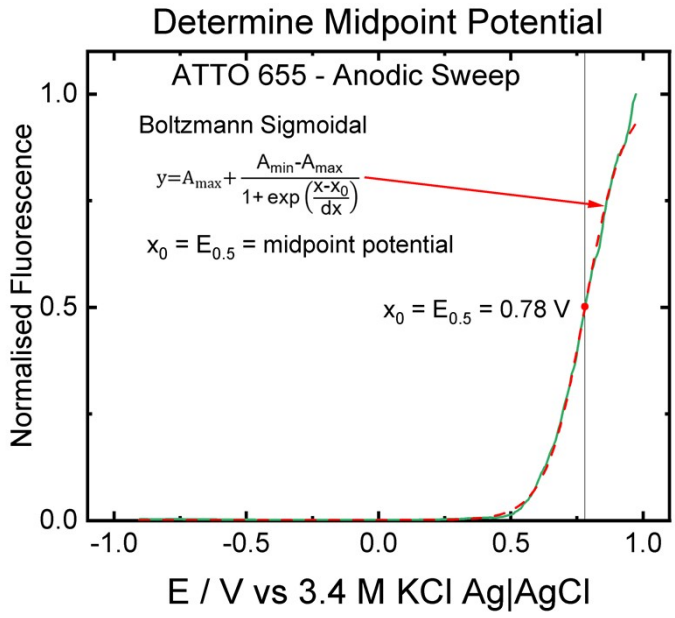


Figure S3: Determine midpoint potential. ATTO 655 adsorbed onto ITO coated with poly-L-lysine and imaged in 1X Dulbecco's phosphate buffered saline, 10% w/v glucose, 0.5 mg mL^{-1} glucose oxidase, 40 µg mL^{-1} catalase, and 2 mM Trolox pH 7.4. The optical cyclic voltammetry of a fluorophore is plotted with the normalised total fluorescence as the y-axis (green). The Botzmann sigmoidal is fitted to the data (red dash line). The x_o is the Boltzmann sigmoidal is the midpoint potential ($E_{0.5}$). The normalised fluorescence is from all localised fluorophores

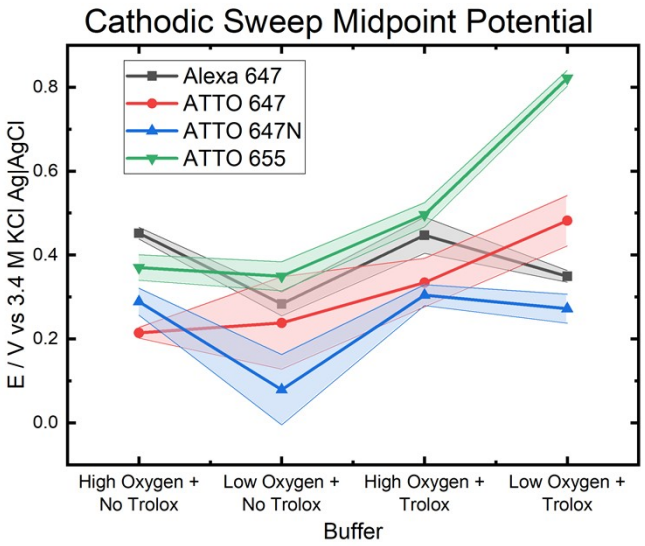
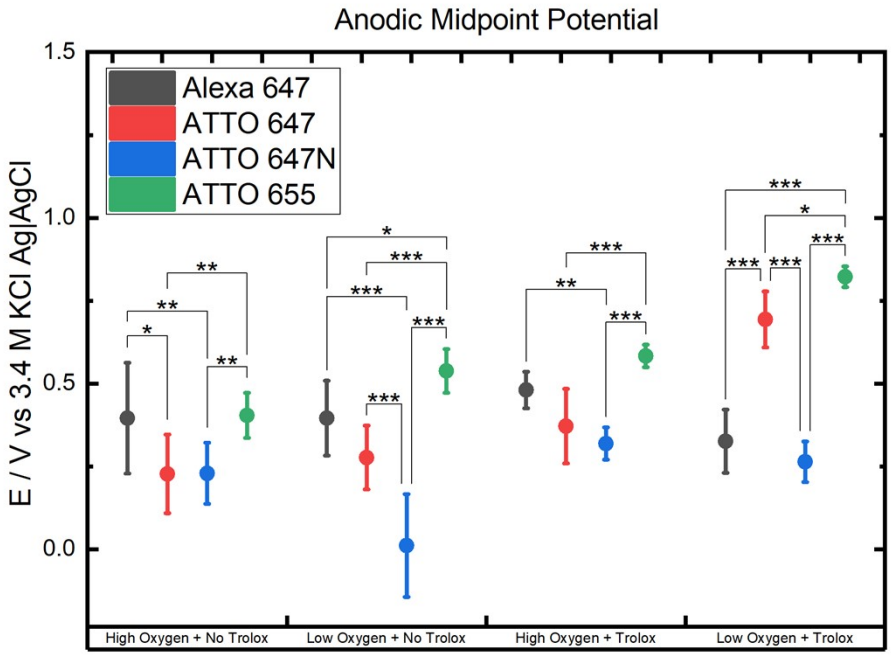


Figure S4: Cathodic midpoint potentials of Alexa 647 (black), ATTO 647 (red), ATTO 647N (blue), and ATTO 655 (green) in the four buffers. Buffer one is high oxygen with no Trolox and is 1X Dulbecco's phosphate buffered saline pH 7.4. Buffer two is low oxygen with no Trolox and is 1X Dulbecco's phosphate buffered saline, 10% w/v glucose, 0.5 mg mL^{-1} glucose oxidase, and 40 μg mL^{-1} catalase pH 7.4. Buffer three is high oxygen with Trolox and is 1X Dulbecco's phosphate buffered saline and 2 mM Trolox pH 7.4. Buffer four is low oxygen with Trolox and is 1X Dulbecco's phosphate buffered saline, 10% w/v glucose, 0.5 mg mL^{-1} glucose oxidase, 40 μg mL^{-1} catalase, and 2 mM Trolox pH 7.4. The results are determined from all localised fluorophores with the variance shown by the shaded regions around each line.



* p<=0.05 ** p<=0.01 *** p<=0.001

Figure S5: The midpoint potential from the anodic sweep of the -1 V to 1 V cyclic voltammetry at 150 mV s^{-1} for Alexa 647, ATTO 647, ATTO 647N, and ATTO 655 in four buffer configurations, buffer one is high oxygen with no Trolox, buffer two is low oxygen with no Trolox, buffer three is high oxygen with Trolox, and buffer four is low with Trolox. The anodic midpoint potential was determined from all localised fluorophores.

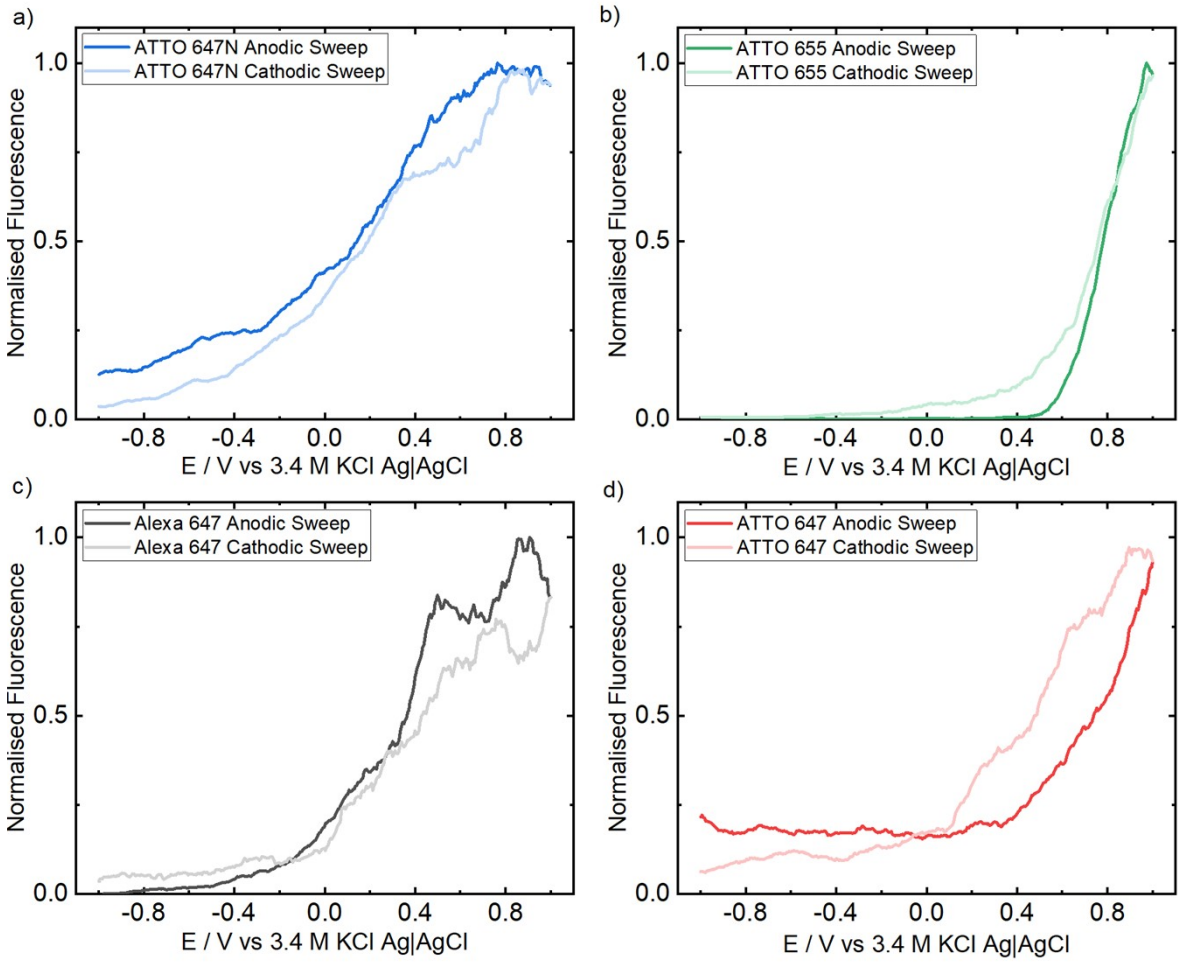


Figure S6: a) ATTO 647N (blue), b) ATTO 655 (green), c) Alexa 647 (black), and d) ATTO 647 (red). On separate samples, the fluorophores are adsorbed onto ITO coated with poly-L-lysine and imaged in 1X Dulbecco's phosphate buffered saline, 10% w/v glucose, 0.5 mg mL^{-1} glucose oxidase, 40 µg mL^{-1} catalase, and 2 mM Trolox. Cyclic voltammetry is set to scan between -1 V and 0.3 V at a scan rate of 150 $mV\ s^{-1}$. The normalised fluorescence is plotted against potential and is from all localised fluorophores.