Zimmer & Peacock

Sensor Manufacturing and Technology

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Amperometric Sensor - Oxygen

2017

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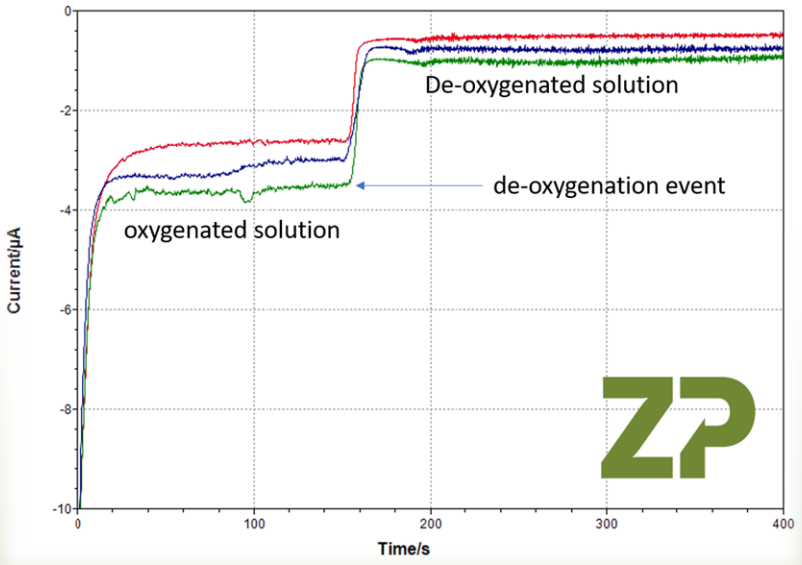
Electrochemical oxygen detection

O_2 ZP

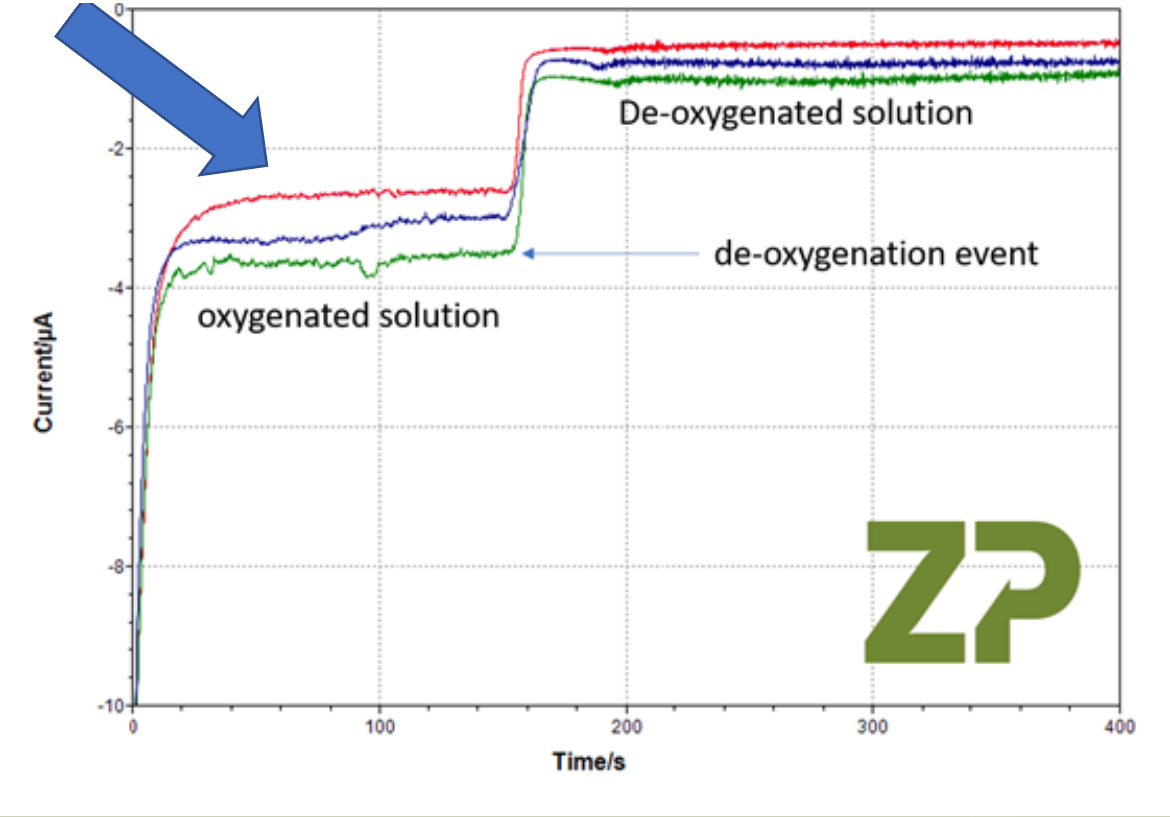
- Description



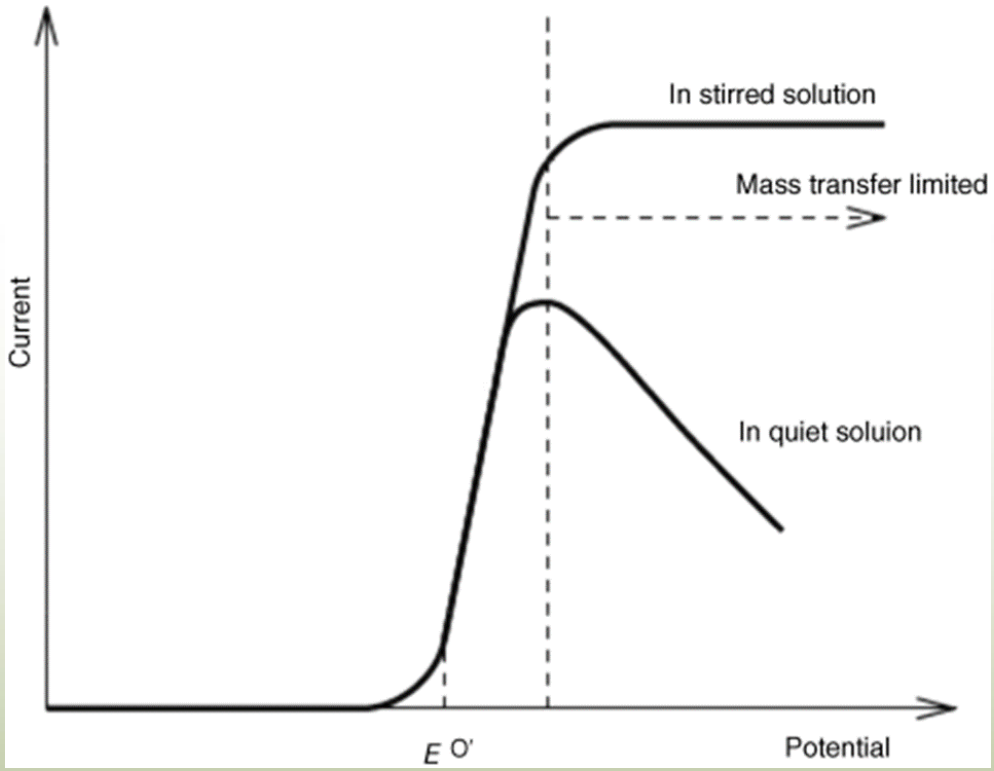
Your data

$$O_2 + 4H^- + 4e^- \rightarrow 2H_2O$$

$2Na_2SO_3 + O_2 = 2Na_2SO_4$



Mass transport controlled versus diffusion controlled



$$i_L/A = k_L n F c^{\infty}$$

$$i = -\frac{nFAD^{1/2}C}{\pi^{1/2}t^{1/2}}$$

where D = diffusion coefficient
C = concentration of O in the bulk solution
A = electrode area

Time for practicals.

- ONE - Take buffer solution and record a cyclic voltammogram.
- TWO - To the solution add in a small amount of oxygen scavenger, and record another CV
- THREE – Compare the two CVs.
- FOUR – In your opinion which voltage is the best voltage for measuring an oxygen concentration.
- FIVE– Run an amperometry experiment on an oxygenated solution at the voltage you chose in FOUR, 1 minute into it add a small drop of the scavenger solution; what do you see?