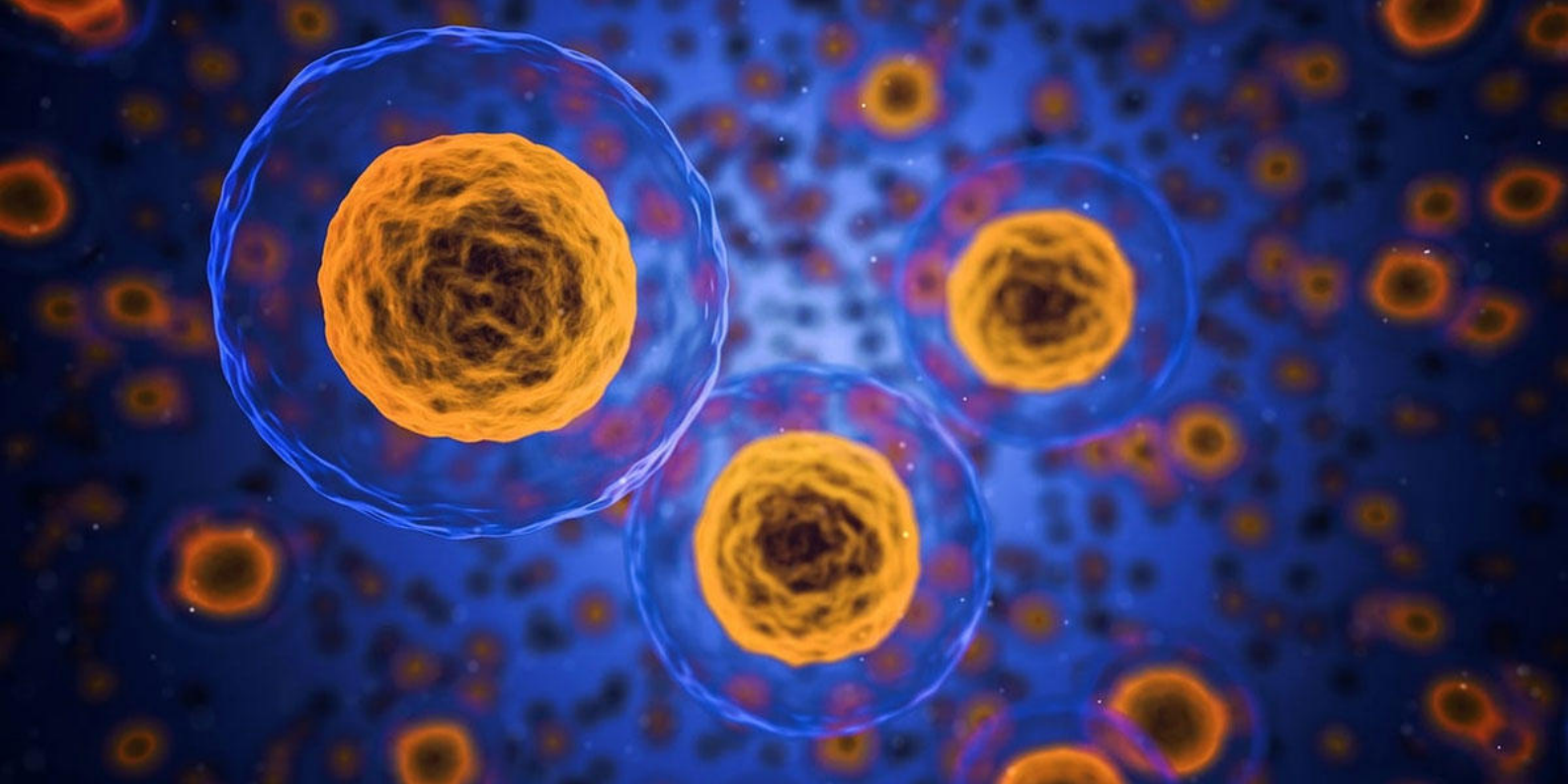




Application Note AN-FLU-002

蛍光によるバイオ試験インジケーター のメカニズムについて

Analysis of Alamar Blue during its electrochemical processes with fluorescence spectroelectrochemistry

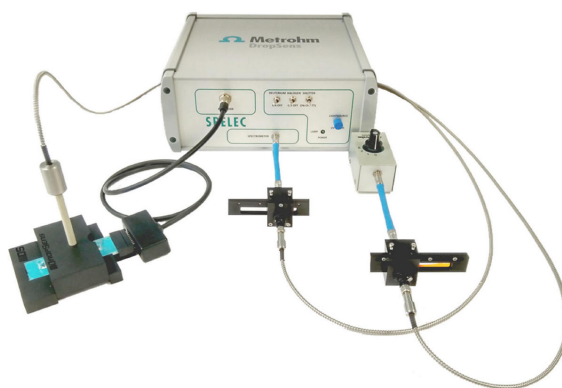
Alamar Blue(別名:レサズリン)は、その光学的特性により、細胞生存率や細胞毒性試験において広く使用される酸化還元インジケーターです。Alamar Blueは弱く蛍光を発する青色染料であり、還元型(レゾルフィン)は高い蛍光を発するピンク色の染料です。

蛍光分光電気化学は、酸化還元反応を追跡し制御するための強力な手法を研究者に提供します。この技

術により、電子移動や化学反応中に生成される中間生成物の存在など、さまざまなプロセスを研究することが可能になります。

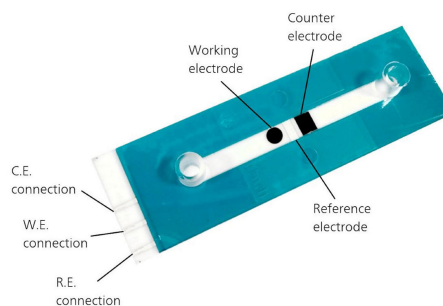
この技術資料では、電気化学的プロセス中にAlamar Blueの特徴的な蛍光を監視する方法を説明し、このシステムに関する完全な知識を得るための手法を紹介しています。

SPELEC(/)(UV-Vis)SPELEC200 nm900 nm395 nm
 LED(LEDVIS395)LEDAlamar Blue
 (RPROBE-VIS-UV)(TLFCL-REFLECELL)(FLKIT)
 FLKIT2(600 m)2(1230–500 nm1300–750 nm)21



1. TLFCL110-CIR

(TLFCL110-CIR)(4 mm²)400 m
 SPELECDropView SPELEC1

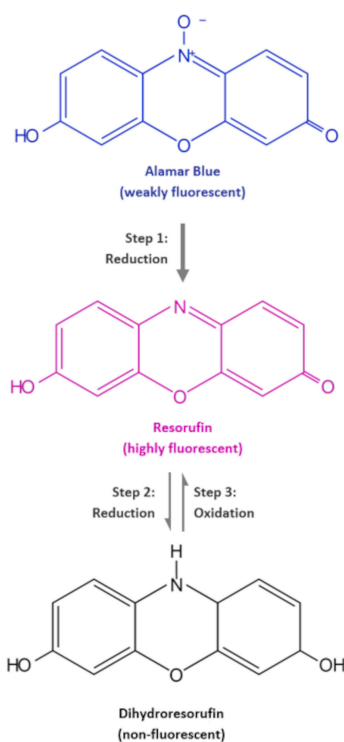


2. 2. TLFCL110-CIR

1.

	SPELEC
	RPROBE-VIS-UV
	LEDVIS395
	FLKIT
Flow-Cell SPE	TLCFL-REFLECELL
	CAST-TLFCL
	TLFCL110-CIR
	DropView SPELEC

ALAMAR BLUE



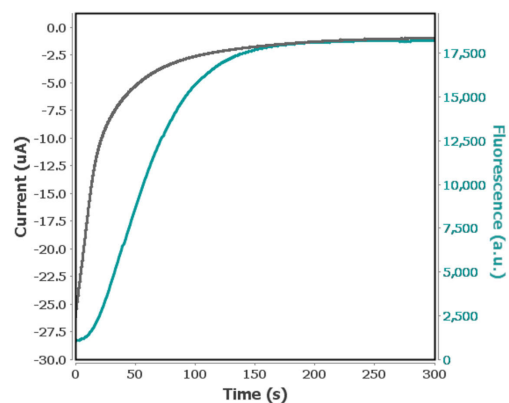
3. Alamar Blue $\bar{\text{r}}$

Alamar Blue3
0.001 mol/LAlamar Blue0.1 mol/LKCl

-0.45 V300Alamar Blue-1.00 V300-0.10 V300

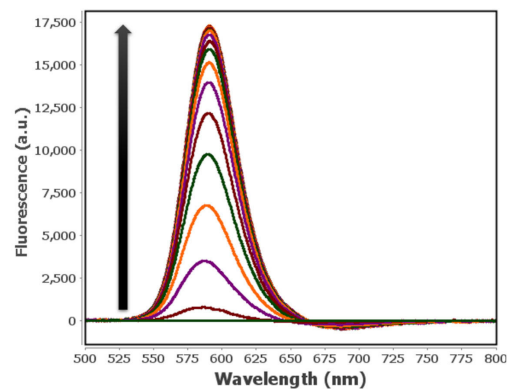
ALAMAR BLUE

-0.45 V300Alamar Blue0.754a()4b590 nm



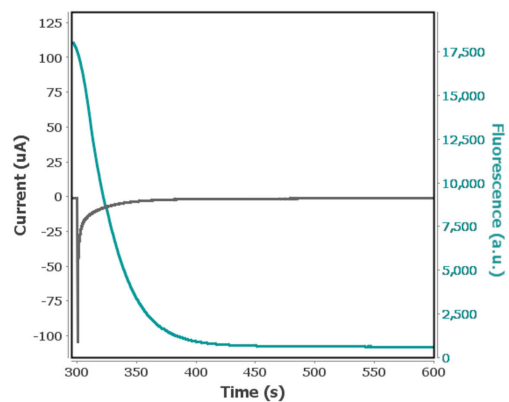
4a

4a590 nm()Alamar Blue200-0.45 VAlamar Blue



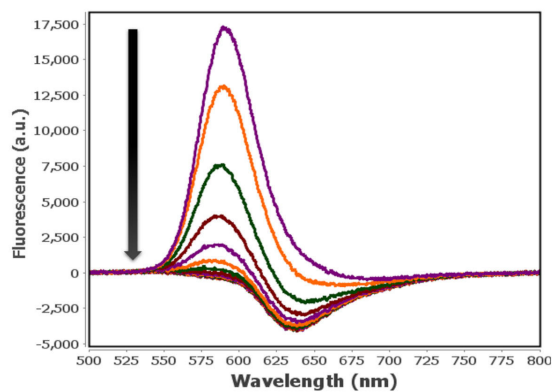
4b

()-1.00 V3005a()590 nm()5b



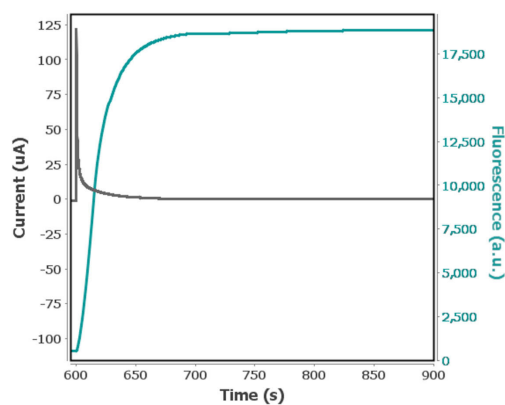
5a

(4a)590 nm-1.00 V100()()3)



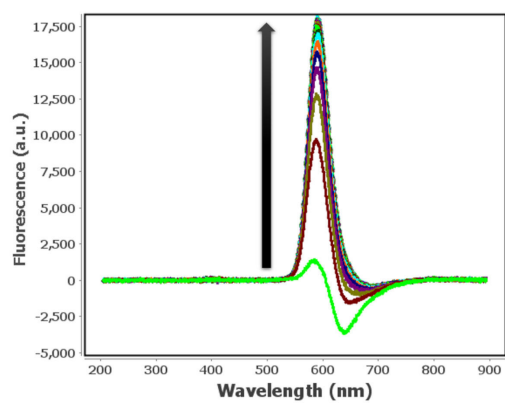
5b

6a-0.10 V300()590 nm()4a



6a 0.001 mol/L Alamar Blue 0.1 mol/L KCl-0.10 V300590 nm

6b590 nm(4b)



6b

-0.45 V-1.00 V

1. Ibáñez, D.; Izquierdo-Bote, D.; Pérez-Junquera, A.; et al. Raman and fluorescence spectroelectrochemical monitoring of resazurin-resorufin fluorogenic system, *Dyes and Pigments*. **2020**, *172*, 107848.
<https://doi.org/10.1016/j.dyepig.2019.107848>
2. O'Brien, J.; Wilson, I.; Orton, T.; et al. Investigation of the Alamar Blue (resazurin) fluorescent dye for the assessment of mammalian cell cytotoxicity, *Eur. J. Biochem.* **2000**, *267*, 5421.
<https://doi.org/10.1046/j.1432-1327.2000.01606.x>
3. Twigg, R.S.; Oxidation-Reduction Aspects of Resazurin, *Nature*. **1945**, *155*, 401.
<https://doi.org/10.1038/155401a0>

AN-FLU-001 Fluorescence spectroelectrochemistry of $[\text{Ru}(\text{bpy})_3]^{2+/3+}$ in semi-infinite diffusion regime

CONTACT

143-0006 6-1-1
null 9

metrohm.jp@metrohm.jp

装置構成



SPELEC UV-VIS Instrument (200-900 nm)

SPELEC is an instrument for performing spectroelectrochemical measurements. It combines in only one box a Lightsource, a Bipotentiostat/Galvanostat and a Spectrometer (UV-VIS wavelength range: 200-900 nm) and includes a dedicated spectroelectrochemical software that allows optical and electrochemical experiments synchronization.



Reflection probe VIS-UV

Reflection probe VIS-UV designed to perform reflection experiments suitable to work with our Reflection Cell for our Screen-printed electrodes or with any conventional cell.

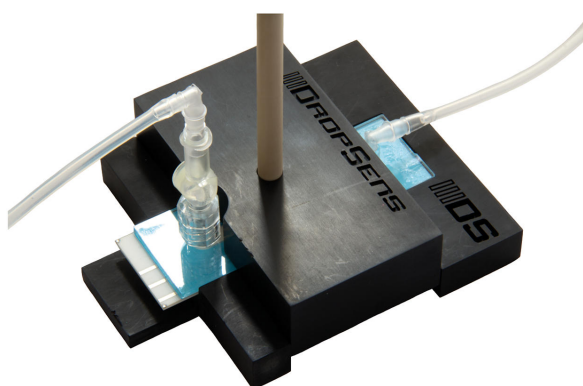
LED light-VIS 395 nm

LED light of 395 nm wavelength



Fluorescence kit

Kit for performing fluorescence experiments composed by 2 x short optical fibers (600 μm) ended in SMA 905 connections, 2 x optical filters one of 230-500 nm and other for 300-750 nm wavelength and 2 x holders for the filters. Complete your set up by adding the required excitation light depending on the range of interest (ref. LEDUV275, LEDVIS395 or LEDRGB). For performing fluorescence spectroscopy experiments coupled to spectroelectrochemistry (ref. SPELEC) with SPEs acquire the suitable reflection probe (RPROBE) and reflection cell (REFLECELL).



Spectroelectrochemical Reflection Cell for Thin-Layer Flow-Cell Screen-Printed Electrodes

Cell for performing spectroelectrochemical measurements in flow conditions in combination with the TLFLC-CIR format Screen-Printed Electrodes, the suitable fittings and ref. RPROBE-VIS-UV.



Stat cable for TLFCL format SPEs

Cable connector from μ Stat instruments and the SPELEC line of instruments to TLFCL format SPEs



Thin-Layer Flow-Cell Integrated Screen-Printed Circular Carbon Electrode

Thin-Layer Flow-Cell Integrated Screen-Printed Circular Carbon Electrode (Aux.:C; Ref.:Ag)