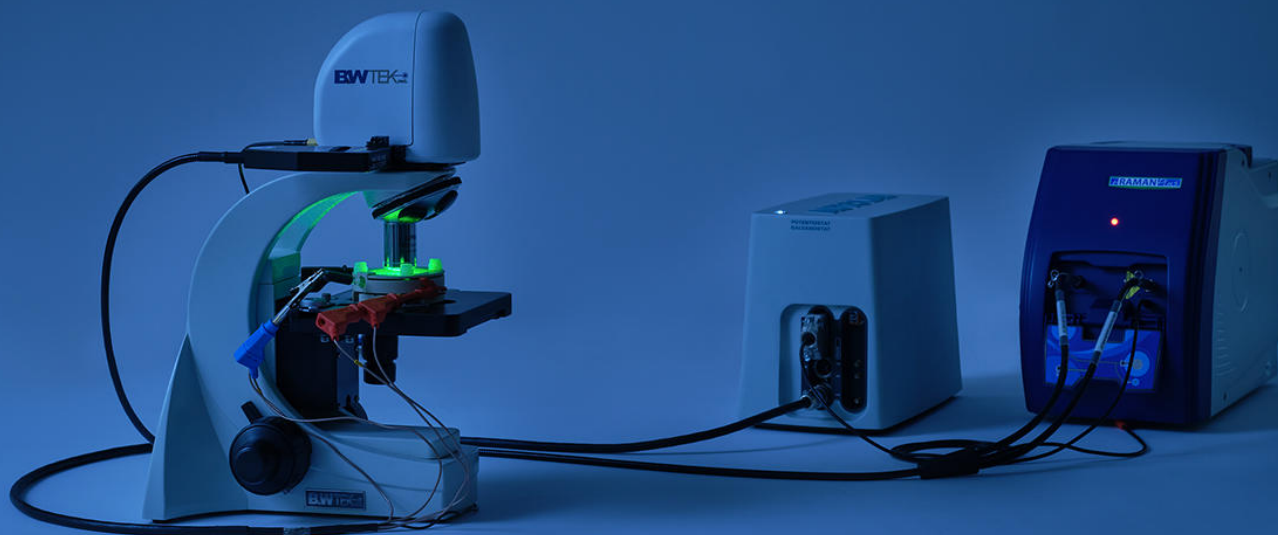




Application Note AN-EC-031

EC-Ramanを用いたフェロシアン化物の酸化モニタリング

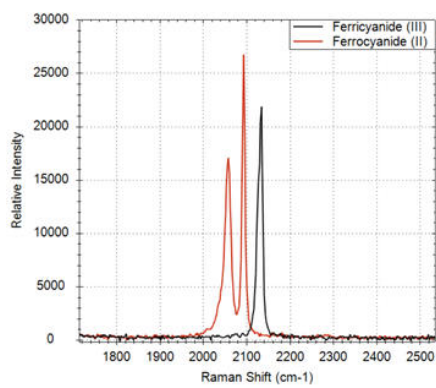
(:) (EC)

EC- (CV)

i-Raman Plus 532H PGSTAT204 (Metrohm Autolab)
EC-Raman Starter Solution (Redox.me) (Ag/AgCl)
) 0.1 mol/L NaOH 50 mmol/L 20i-Raman Plus 532H

SpecSuit EC-SpecSuit 5 sec 100 % CV-0.2 V+0.65 V
0V 110 mV/s

$([\text{Fe}(\text{CN})_6]^{4-})/([\text{Fe}(\text{CN})_6]^{3-}) (1)$



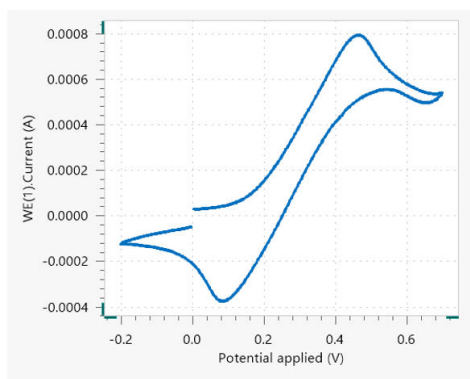
1. Fe(III)Fe(II)

(1)2056 cm⁻¹ 2096 cm⁻¹2(v CN)2(EgA1g)12134 cm⁻¹(EgA1g)11

1 ([Fe(CN)₆]⁴⁻)([Fe(CN)₆]³⁻)

Compound	Raman shift (cm-1)	Vibration mode	Label
[Fe(CN) ₆] ⁴⁻	2062 (2056)	CN (E _g)	1
	2098 (2096)	CN (A _{1g})	2
[Fe(CN) ₆] ³⁻	2129 (2134**)	CN (E _g)	3
	2135 (2134**)	CN (A _{1g})	

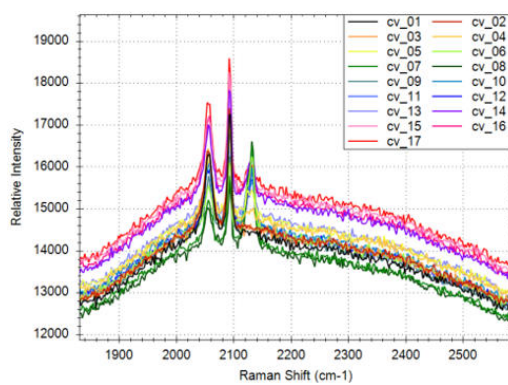
2()



2. 2 EC-Raman 10 mV/s

100mV1733(cv_01cv_03)2cv_04(0.3 V vs. Ag/AgCl)

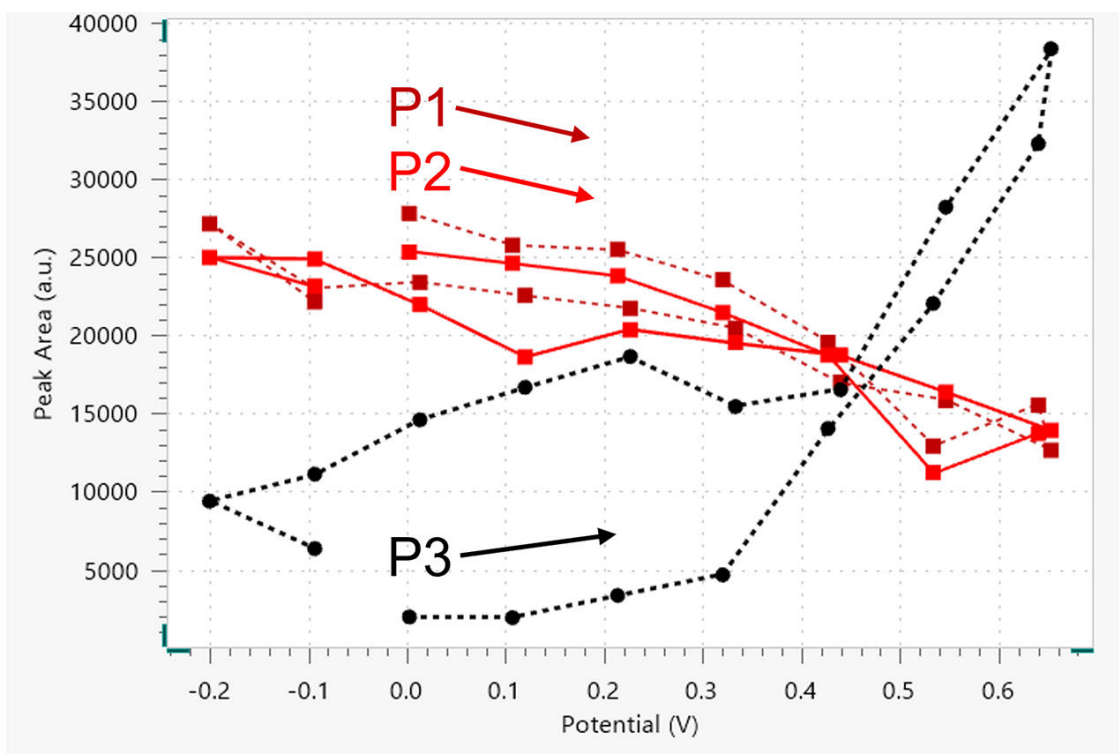
32134 cm⁻¹CV(cv_17)



3. 3 EC-Raman CV 2100mV

3SpecSuit (4) 42056 cm⁻¹1(P1)2096 cm⁻¹2(P2) 3

(P3)/P1P2CVP30.6 V CV



4. 4 P1P2P3CVvs.EV vs. Ag/AgCl3CV

EC-Raman

1. Robinson, J.; Fleischmann, M.; Graves, P. R. The Raman Spectroscopy of the Ferricyanide/Ferrocyanide System at Gold, - Palladium Hydride and Platinum Electrodes. *J. Electroanal. Chem. Interfacial Electrochem.* **1985**, 182 (1), 12.
[https://doi.org/10.1016/0368-1874\(85\)85442-3](https://doi.org/10.1016/0368-1874(85)85442-3).
2. Elgrishi, N.; Rountree, K. J.; McCarthy, B. D.; et al. A Practical Beginner's Guide to Cyclic Voltammetry. *J. Chem. Educ.* **2018**, 95 (2), 197–206.
<https://doi.org/10.1021/acs.jchemed.7b00361>.
- 3.

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i-Raman Plus 532H

i-Raman[®] Plus 532H i-Raman TE CCD 30

i-Raman Plus 532H 65 cm⁻¹ 3400 cm⁻¹ i-Raman Plus XYZ BWIQ[®] BWID[®] i-Raman Plus



Autolab PGSTAT204

The PGSTAT204 combines the small footprint with a modular design. The instrument includes a base potentiostat/galvanostat with a compliance voltage of 20 V and a maximum current of 400 mA or 10 A in combination with the BOOSTER10A. The potentiostat can be expanded at any time with one additional module, for example the FRA32M electrochemical impedance spectroscopy (EIS) module.

The PGSTAT204 is an affordable instrument which can be located anywhere in the lab. Analog and digital inputs/outputs are available to control Autolab accessories and external devices are available. The PGSTAT204 includes a built-in analog integrator. In combination with the powerful NOVA software it can be used for most of the standard electrochemical techniques.