

## Spectroelectrochemical flow cell

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- **Experiment 1 using spectroelectrochemical flow cell (SEC-F)**

Conditions: 10mM ferrocene in 0.1M acetonitrile with TEAP, working electrode: ITO, reference electrode: RE-3V, counter electrode: Pt wire, electrolyzed at 800mV for 400 second, 10mM ferrocene solution as the reference of absorbance.

The change of absorbance due to oxidation product of ferrocene during electrolysis measurement can be observed clearly near 620nm.

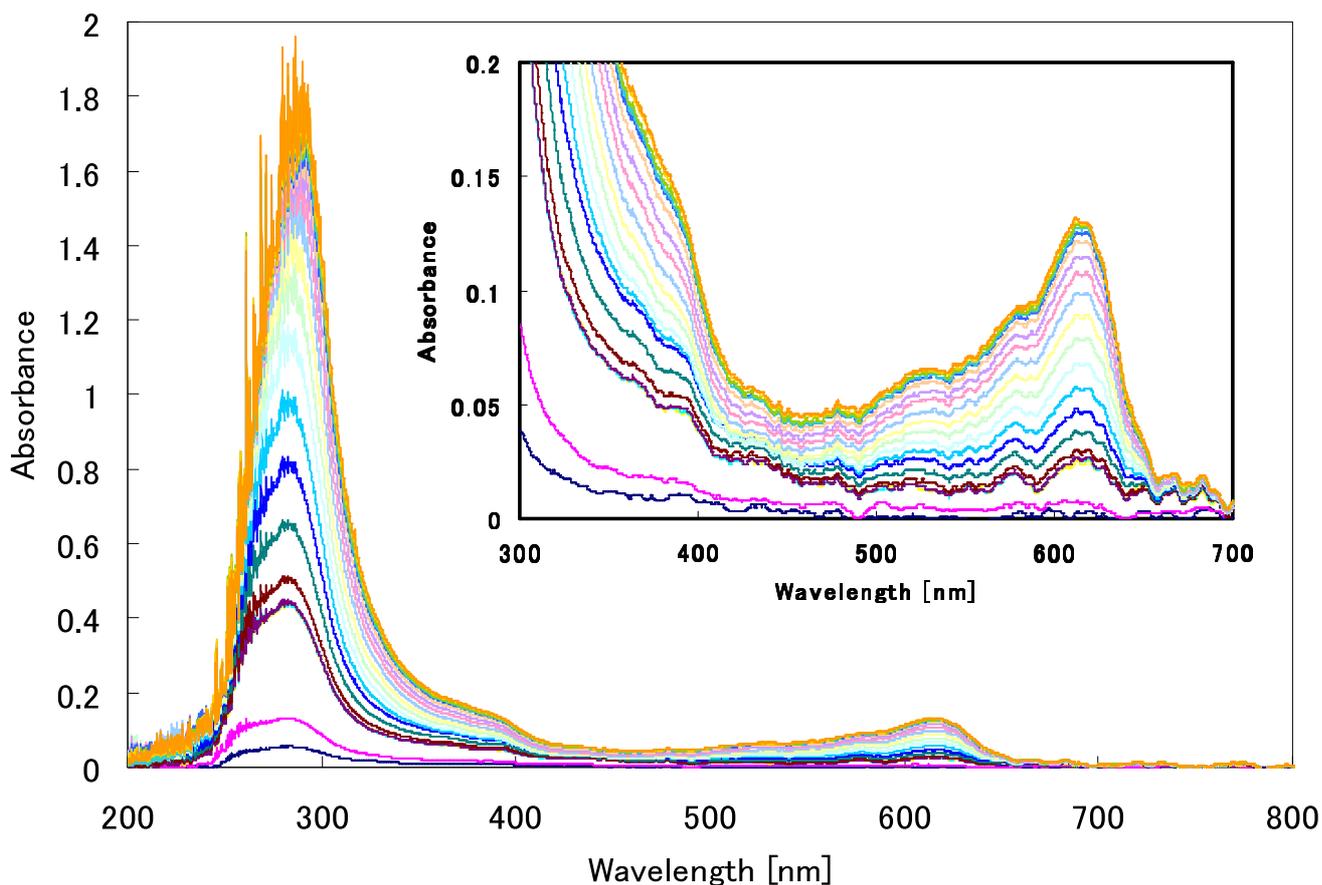


Figure 1. The absorbance of ferrocene and products. Electrolysis conditions: 800 mV, 400 second.

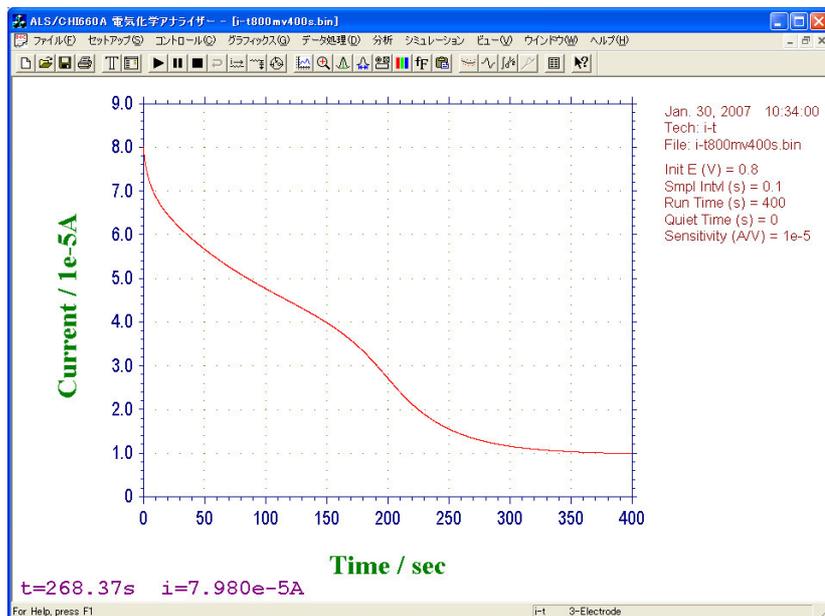


Figure 2. I-t curve of ferrocene in electrolysis conditions: 800 mV, 400 second.

- **Experiment 2 using spectroelectrochemical flow cell (SEC-F)**

Conditions: 2mM **potassium hexacyanoferrate(III)** in 1M KNO<sub>3</sub>, working electrode: ITO, reference electrode: RE-3V, counter electrode: Pt wire, sweep from 0mV to 500mV at scan rate of 0.05 V/s, 2mM **potassium hexacyanoferrate(III)** solution as the reference of absorbance. Figure 3 shows the change of absorbance due to reduction of **potassium hexacyanoferrate (III)** at 0, 1, 2, 4, 6, 8, 10 sec respectively.

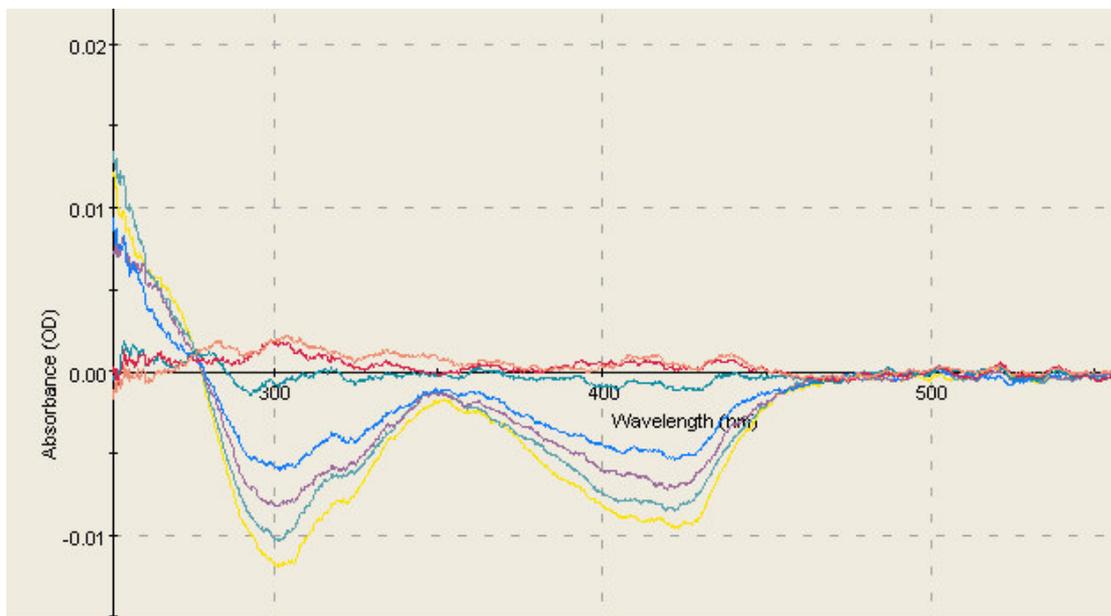


Figure 3. The absorbance of **potassium hexacyanoferrate(III)** and products. Electrolysis conditions: sweep from 0mV to 500mV.

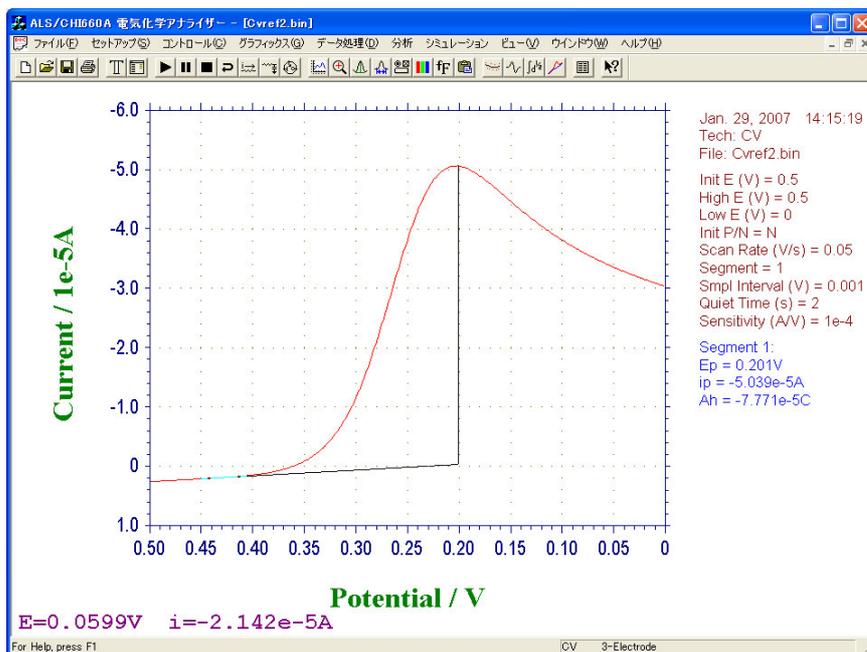
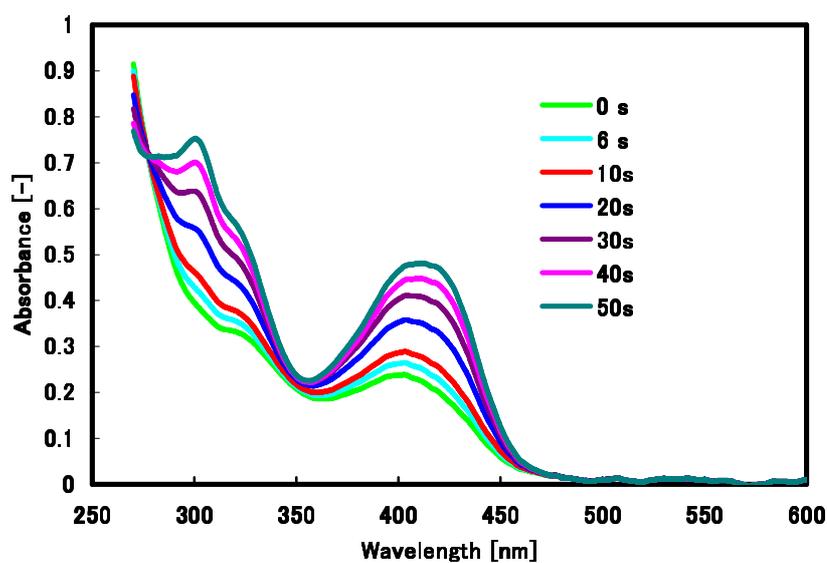


Figure 4. The change of current of potassium hexacyanoferrate(III), when sweep from 0mV to 500mV.

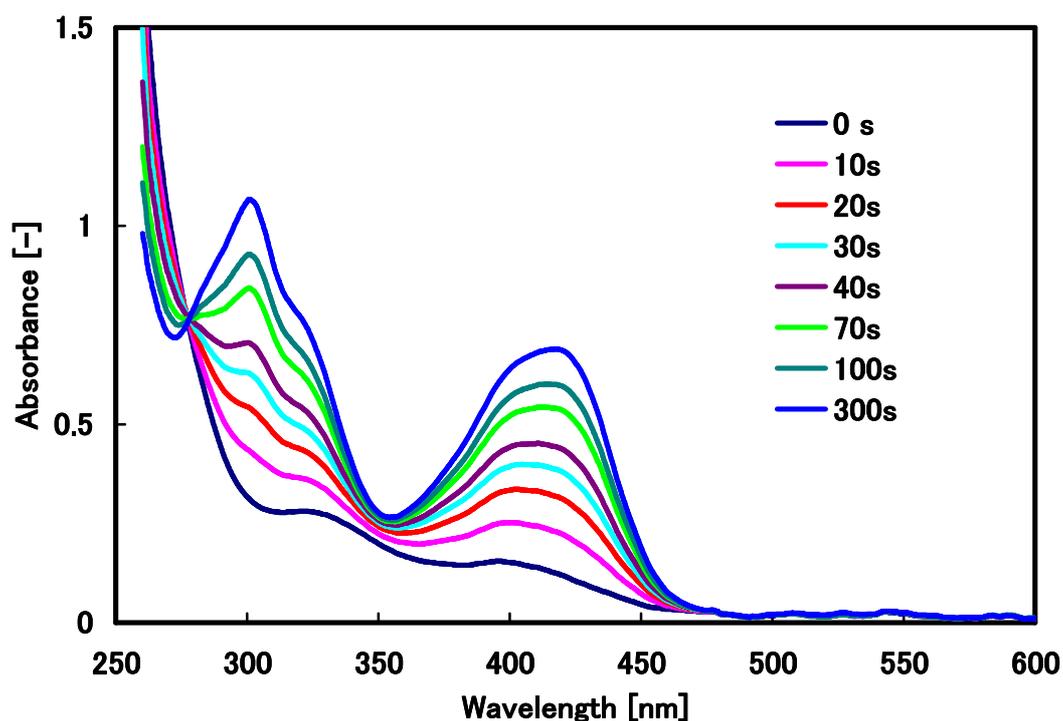
- **Experiment 3 using spectroelectrochemical flow cell (SEC-F)**

1. Conditions: 20mM **potassium hexacyanoferrate (II)** in 1M KNO<sub>3</sub>, working electrode: ITO, reference electrode: RE-3V, counter electrode: Pt wire, sweep from 0 mV to 500mV at scan rate of 0.01 V/s, 1M KNO<sub>3</sub> solution as the reference of absorbance. Figure 5 shows the change of absorbance due to oxidation of **potassium hexacyanoferrate (II)** at 0, 6, 10, 20, 30, 40, 50 sec, respectively.



**Figure 5. The absorbance of potassium hexacyanoferrate(II) and products. Electrolysis conditions: sweep from 0mV to 500mV.**

2. Conditions: 20mM **potassium hexacyanoferrate(II)** in 1M KNO<sub>3</sub>, working electrode: ITO, reference electrode: RE-3V, counter electrode: Pt wire, electrolyzed at 500mV for 300 second, 1M KNO<sub>3</sub> solution as the reference of absorbance. Figure 6 shows the change of absorbance due to oxidation of **potassium hexacyanoferrate(II)** at 0, 10, 20, 30, 40, 70, 100, 300 sec respectively.



**Figure 6. The absorbance of potassium hexacyanoferrate(II) and products. Electrolysis conditions: 500mV, 300 second.**