

BR反応と僕の無限の可能性

～すべてはサイエンスショーから始まった～

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Science Inquiry Course
Shizuoka Municipal High School

■ Motivation for applying for GSC

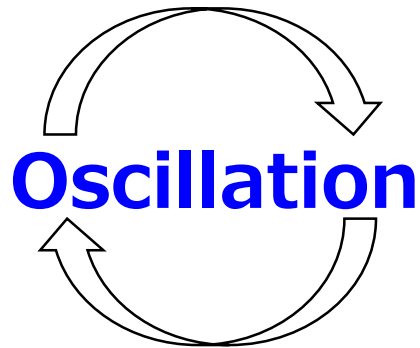
Love
science

科学探究科 に入学
科学部 に入部

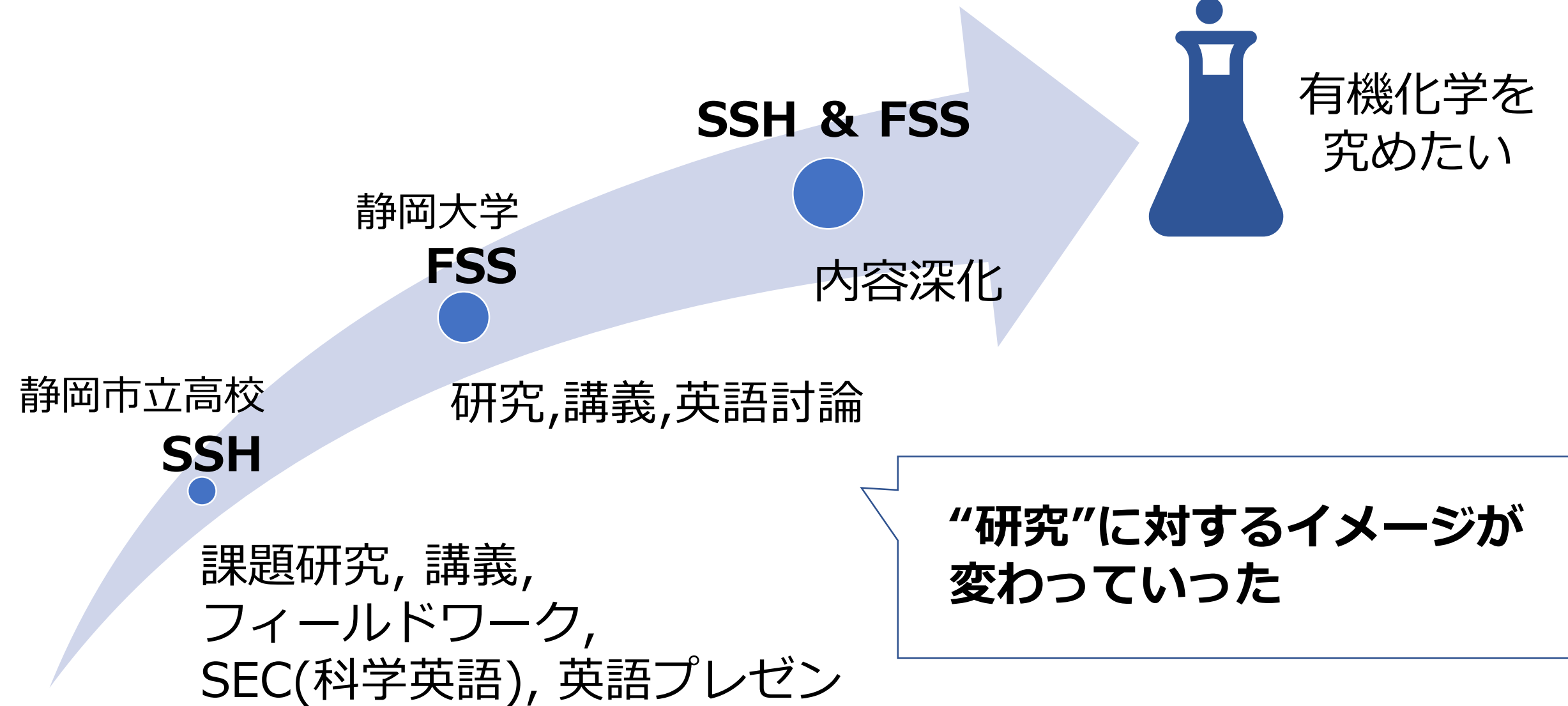
Science
show

!!!!

FSS(GSC)



Activities at SSH & FSS





文部科学大臣賞 (GSC)
三大学学長賞 (高校化学グラコン)
化学部門一等賞 (TISF)



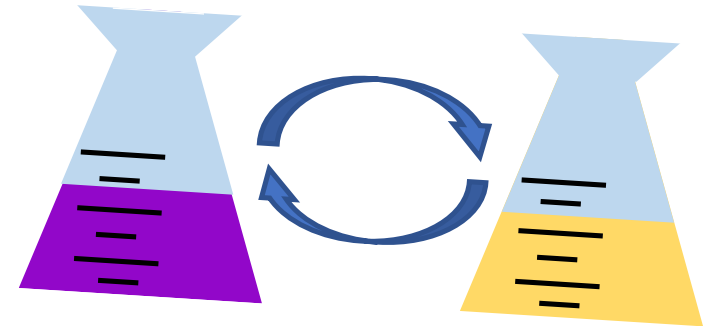
Google Earth

| Purpose



To find new oscillations

Effects of the redox active indicators on the oscillation behavior of the BR reaction were investigated.



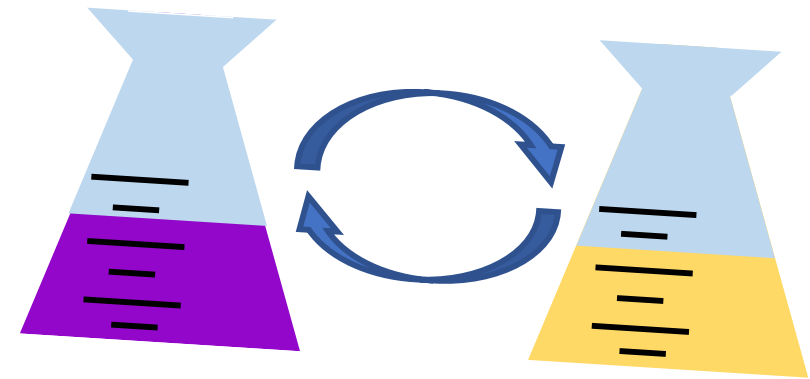
Experimental method

1 % starch aq.

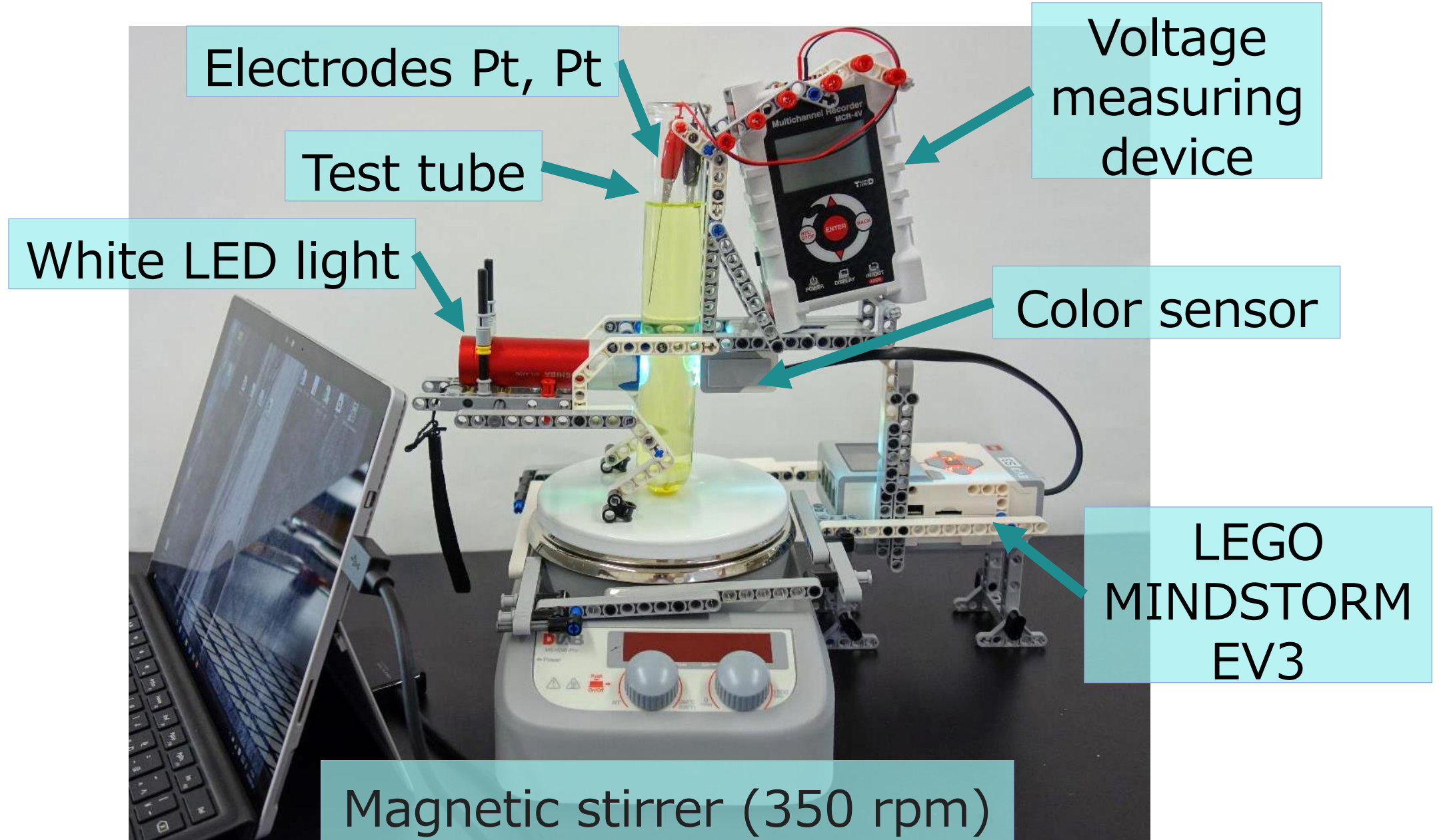
Indicator for iodine test

4.4	mmol	KIO_3 aq.
1.2	mmol	H_2SO_4 aq.
25	mol	H_2O_2 aq.
3.1	mmol	Malonic Acid aq.
0.7	mmol	MnSO_4 aq.

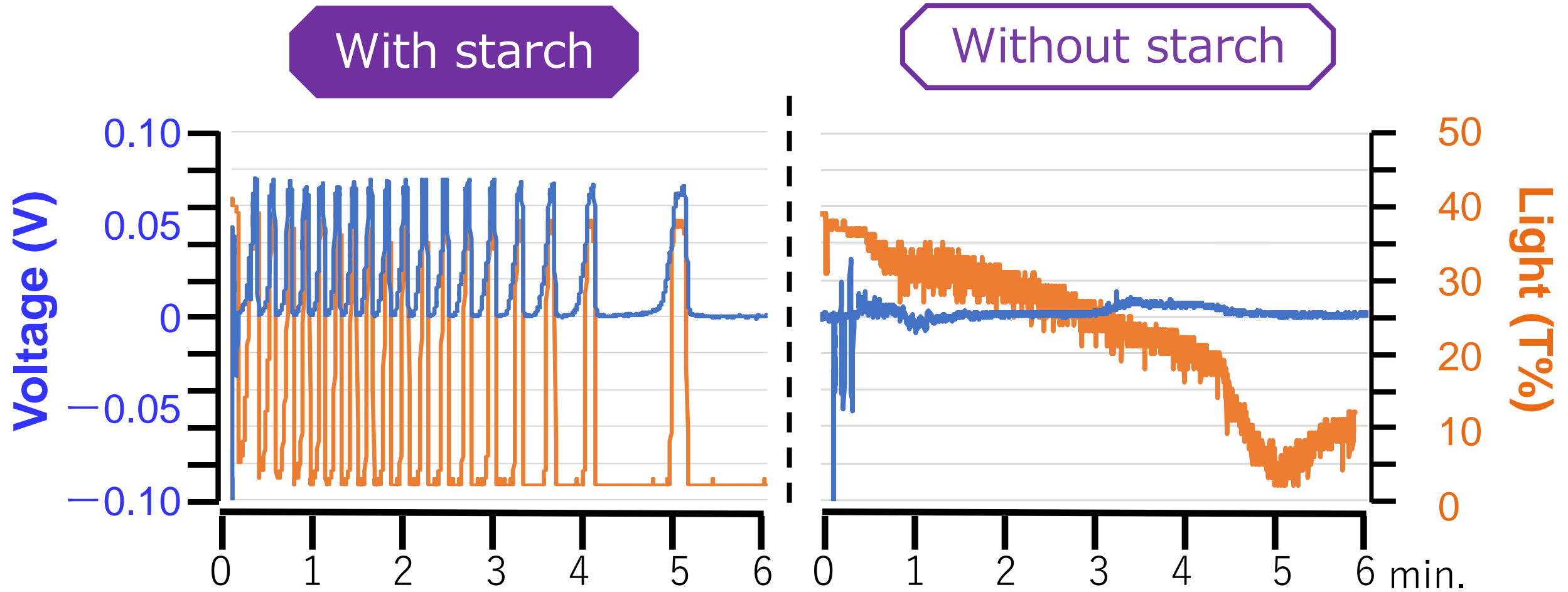
What will happen if starch is exchanged to another indicator?



Overall view of equipment

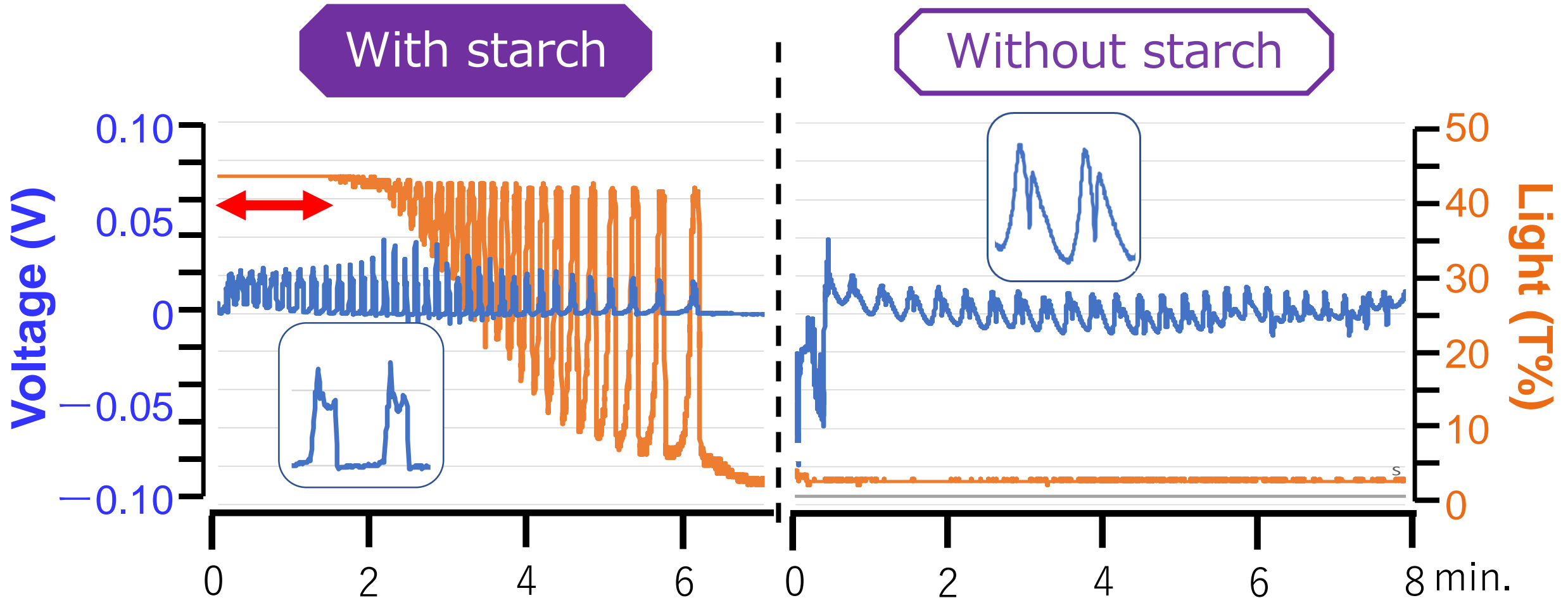


Comparison of the general BR reactions



Starch might have some important functions on BR oscillation.

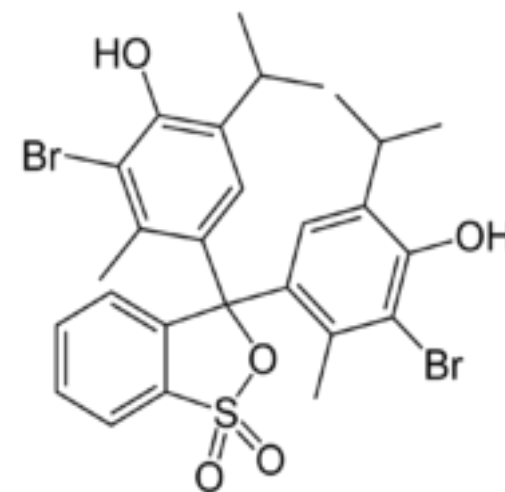
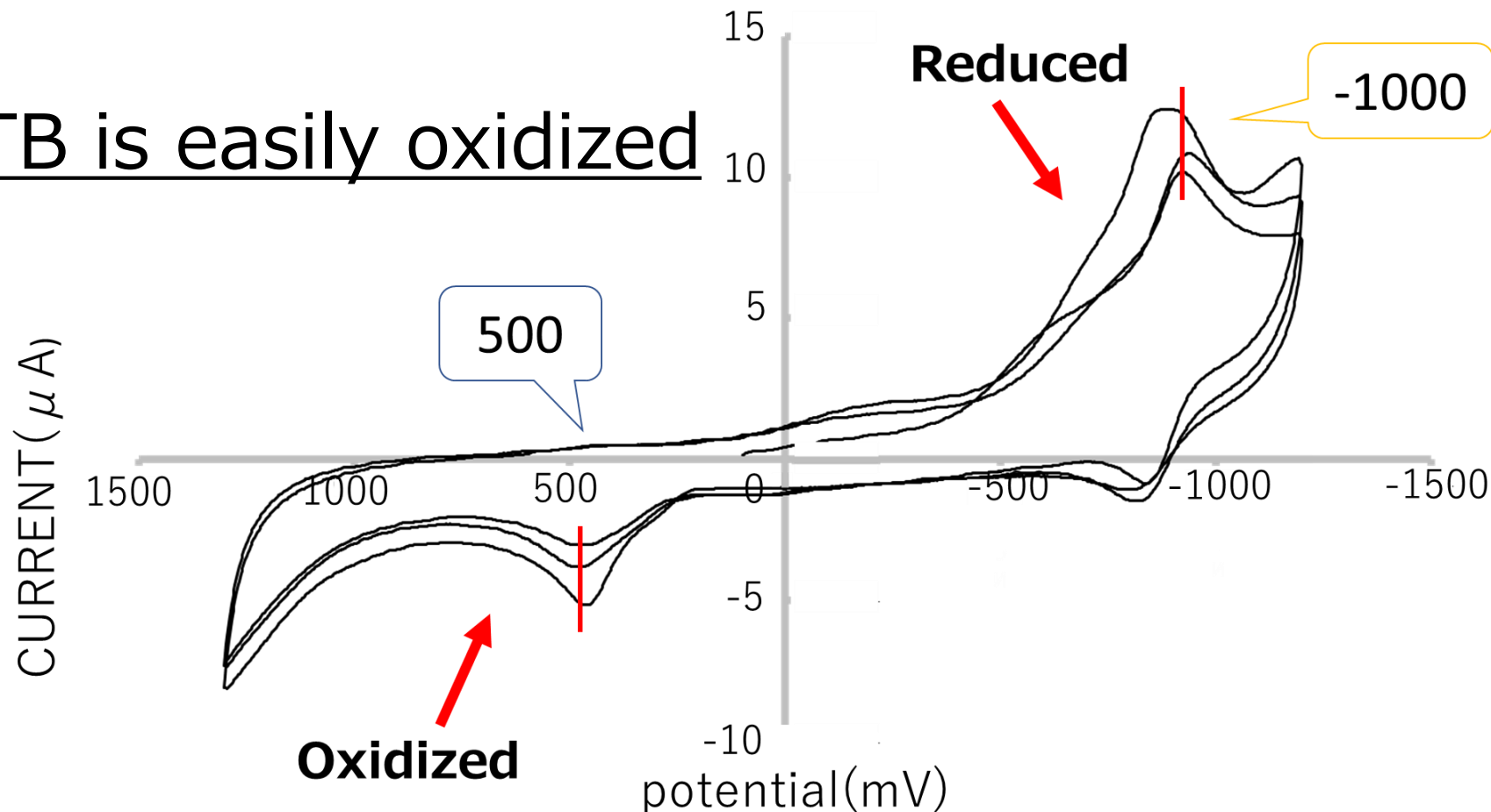
Adding **BTB** to the general BR reactions



Quite different color/voltage oscillations were shown.

Cyclic Voltammetry data of BTB

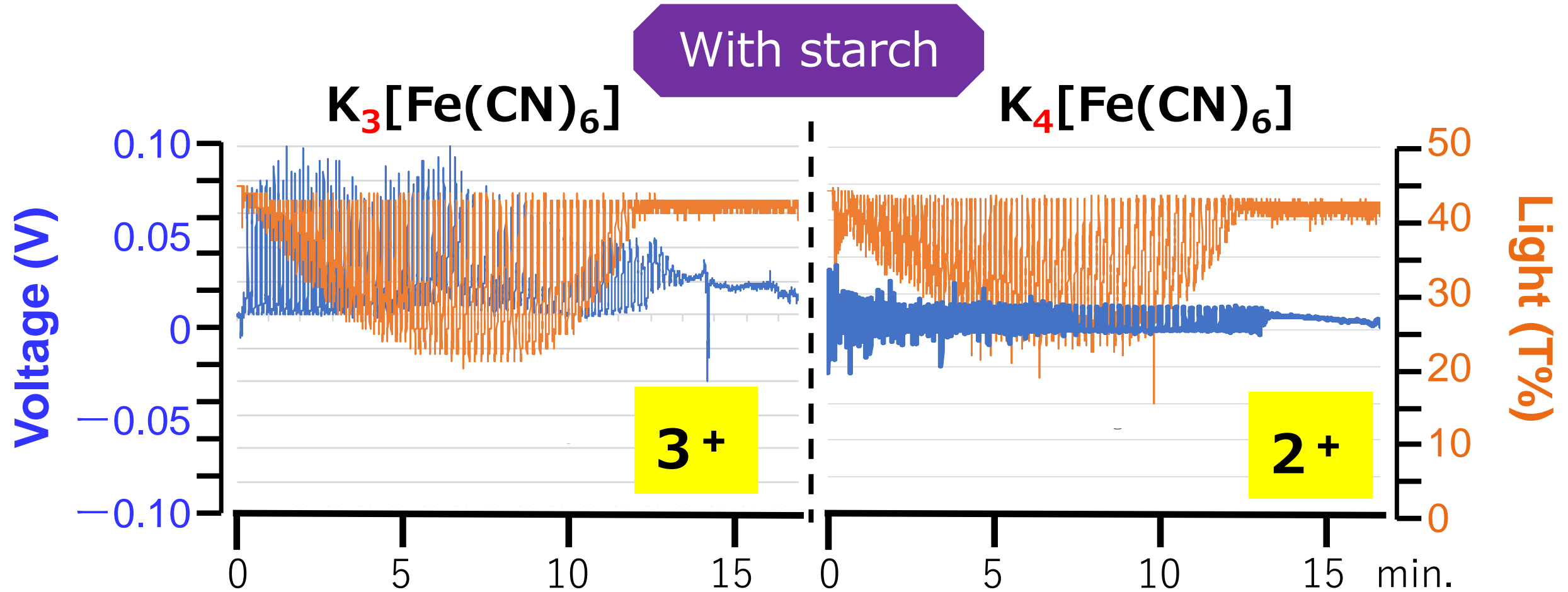
BTB is easily oxidized



Bromothymol
blue

Is the redox reaction of BTB involved in "new oscillation" ?

Adding redox active indicators to the general BR reactions



Almost the same visible oscillation were observed. But there were some differences between them.

| Consideration

- ✓ Redox active indicators, which were added instead of starch, caused new oscillations in the BR reaction.
- ✓ We suppose that any substance as well as redox activities of $[\text{Fe}(\text{CN})_6]^{3-}$ and $[\text{Fe}(\text{CN})_6]^{4-}$ significantly affect the oscillation of the BR reactions. .
- ✓ Starch has significant effect on BR reaction.

Future subjects

Investigate how indicators cause the new oscillation in the BR reaction

- ✓ Clarify the effects of the quantity of indicators added in the solution of the BR reaction on the oscillation behaviors
- ✓ Study of the effects by adding another redox active substances

Acknowledgment

I would like to thank my co-workers Mikana Sugimori, Ibuki Sugiyama, (Shizuoka Municipal High School 2nd Grade), FSS program of Shizuoka university, Prof. Kondo of Shizuoka University and Ms. Totsuka of Shizuoka Municipal High School.

References

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3. *SSH Student Research Presentation as of 2017
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