

This note describes a determination method of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) using HPLC-ECD (high-performance liquid chromatography-electrochemical detection) system.

H<sub>2</sub>O<sub>2</sub> is used for various purpose, such as disinfectant, oxidizing agent, and rinse solution. Determination of H<sub>2</sub>O<sub>2</sub> is required also for evaluation of fuel cells. Simple determination method for H<sub>2</sub>O<sub>2</sub> was often performed by titration or voltammetry. However, the detection of

these methods lack selectivity.

ECD, which is similar to voltammetry in principle, detects electric current generated by applied oxidation or reduction potential. However, the detection by ECD is performed after the HPLC separation, which provides excellent selectivity.

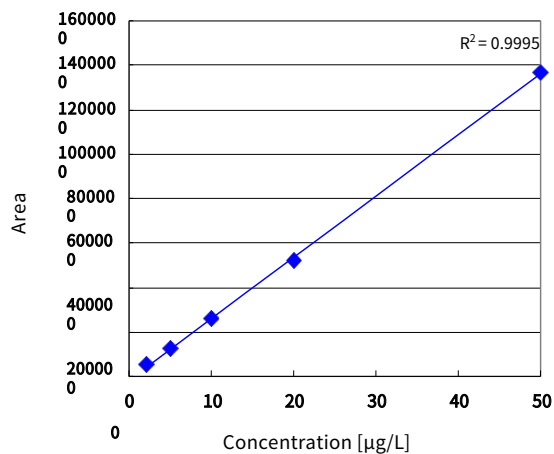
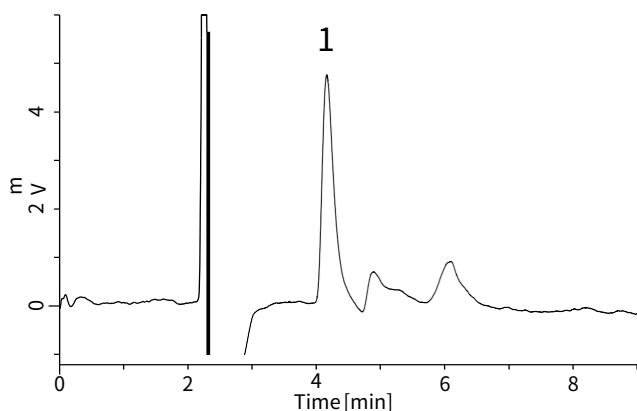
The method described in this note enables sensitive detection and accurate quantification of H<sub>2</sub>O<sub>2</sub>.

(K.Suzuki)

## A chromatogram obtained from standard solution

1. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)

10 µg/L



The calibration curve of H<sub>2</sub>O<sub>2</sub>

### HPLC conditions

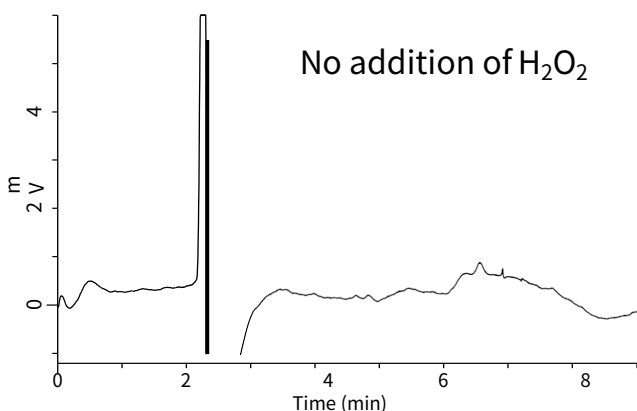
**Column** : Inertsil CX (5 µm, 250 × 4.6 mm I.D.)  
**Flow rate** : 0.8 mL/min  
**Detection** : ECD  
**Injection volume** : 100 µL

Contact us if more detailed conditions are necessary.

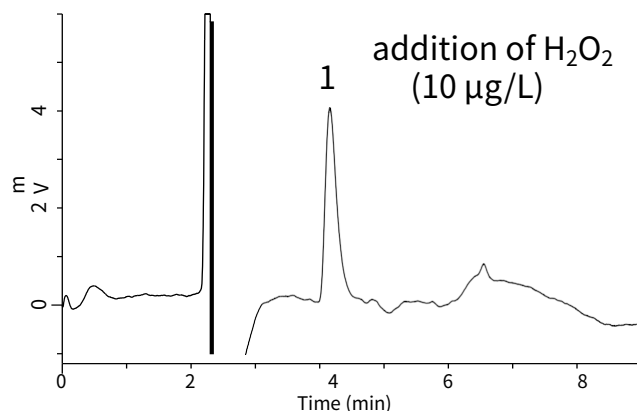
## Determination of H<sub>2</sub>O<sub>2</sub> in tap water

1. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)

No addition of H<sub>2</sub>O<sub>2</sub>



addition of H<sub>2</sub>O<sub>2</sub>  
(10 µg/L)



## Cautions for the calibration

Accurate concentration of commercially available H<sub>2</sub>O<sub>2</sub> solution is not mentioned. The following is a titration method for determination of the H<sub>2</sub>O<sub>2</sub> concentration.

① Determination of the standard solution of potassium permanganate

- Prepare standard solution of sodium oxalate
- Add diluted sulfuric acid to the solution
- Heat to about 80 °C
- Titrate with the standard solution of potassium permanganate

② Determination of H<sub>2</sub>O<sub>2</sub> solution to be examined

- Dilute the H<sub>2</sub>O<sub>2</sub> solution
- Add diluted sulfuric acid to the solution
- Titrate with the potassium permanganate solution already calibrated

Based on the results of ① and ②, the accurate concentration of the H<sub>2</sub>O<sub>2</sub> solution for laboratory use can be obtained.

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### GL Sciences Inc. Japan

22-1 Nishishinjuku 6-chome  
Shinjuku-ku, Tokyo  
163-1130, Japan

Phone: +81-3-5323-6620  
Fax: +81-3-5323-6621  
Email: [world@glsc.co.jp](mailto:world@glsc.co.jp)  
Web: [www.glsciences.com](http://www.glsciences.com)

### GL Sciences Inc. USA

4733 Torrance Blvd. Suite 255  
Torrance, CA 90503  
USA

Phone: +1-310-265-4424  
Fax: +1-310-265-4425  
Email: [info@glsciencesinc.com](mailto:info@glsciencesinc.com)  
Web: [www.glsciencesinc.com](http://www.glsciencesinc.com)

### GL Sciences B.V.

Dillenburgstraat 7C  
5652AM, Eindhoven  
The Netherlands

Phone: +31-40-254-9531  
Email: [info@glsciences.eu](mailto:info@glsciences.eu)  
Web: [www.glsciences.eu](http://www.glsciences.eu)

### GL Sciences (Shanghai) Limited

Tower B, Room 2003  
Far East International Plaza  
No.317 Xianxia Road, Changning District  
Shanghai, China 200051

Phone: +86-21-62782272  
Email: [contact@glsciences.com.cn](mailto:contact@glsciences.com.cn)  
Web: [www.glsciences.com.cn](http://www.glsciences.com.cn)



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