

This note describes a determination method of hydrogen peroxide (H₂O₂) using HPLC-ECD (high-performance liquid chromatography-electrochemical detection) system.

H₂O₂ is used for various purpose, such as disinfectant, oxidizing agent, and rinse solution. Determination of H₂O₂ is required also for evaluation of fuel cells. Simple determination method for H₂O₂ was often performed by titration or voltammetry. However, the detection of

these methods lack selectivity.

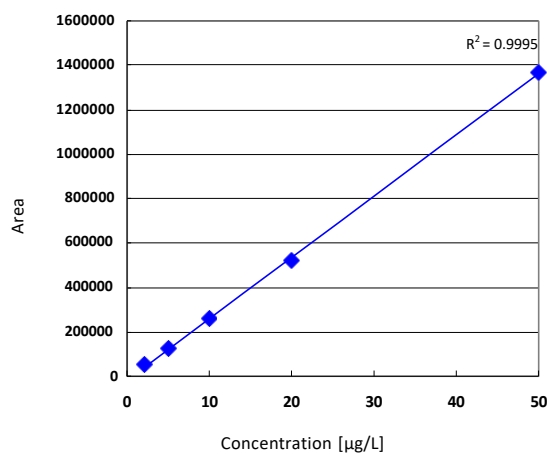
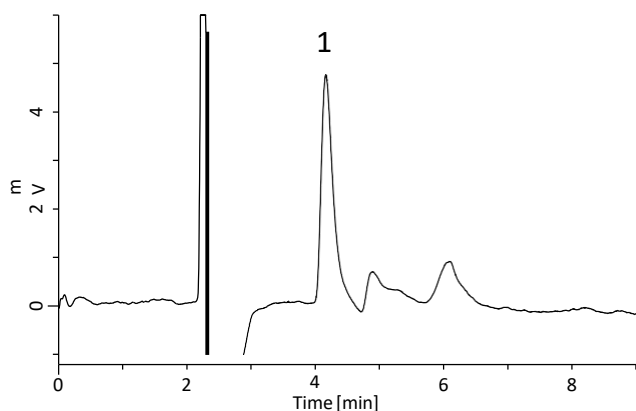
ECD, which is similar to voltammetry in principle, detects electric current generated by applied oxidation or reduction potential. However, the detection by ECD is performed after the HPLC separation, which provides excellent selectivity.

The method described in this note enables sensitive detection and accurate quantification of H₂O₂.

(K.Suzuki)

A chromatogram obtained from standard solution

1. Hydrogen peroxide (H₂O₂)
10 µg/L



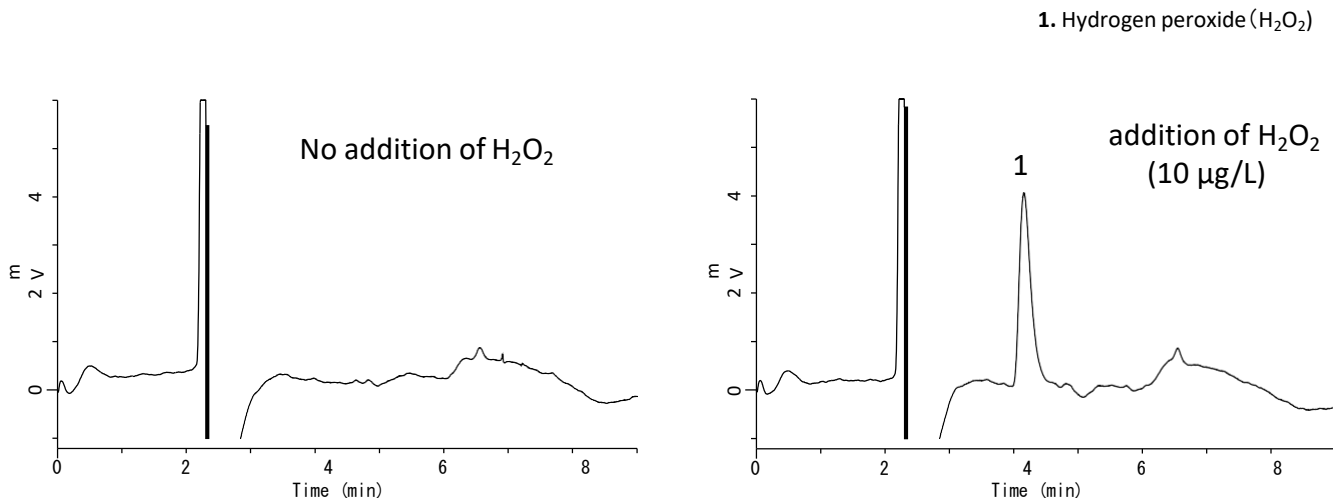
The calibration curve of H₂O₂

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 H₂O₂ in tap water



Cautions for the calibration

Accurate concentration of commercially available H_2O_2 solution is not mentioned. The following is a titration method for determination of the H_2O_2 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_2O_2 solution to be examined

- Dilute the H_2O_2 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_2O_2 solution for laboratory use can be obtained.

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