

# Ethanol Content Assay Kit

**Note:** It is necessary to predict 2-3 large difference samples before the formal determination.

**Operation Equipment:** Spectrophotometer

**Catalog Number:** BC5100

**Size:** 50T/48S

## Components:

**Reagent I:** Liquid 30 $\mu$ L $\times$ 1, store at -20°C. According to the required amount of the experiment, according to the ratio of reagent I: distilled water =2.5  $\mu$ L: 247.5  $\mu$ L (5T amount), mix well, and prepare before use.

**Reagent II :** Liquid 30 mL $\times$ 1, store at 2-8°C.

**Reagent III A:** Liquid 15mL $\times$ 1, store at 2-8°C.

**Reagent III B:** Liquid 15mL $\times$ 1, store at 2-8°C. According to the amount required in the experiment, in accordance with the ratio of reagent III A: reagent III B = 1:1, mix well, and prepare before use.

**Standard:** Liquid 0.5mL $\times$ 1, store at 2-8°C. Before use, mix 10  $\mu$ L of standard and 310  $\mu$ L of distilled water to prepare a standard solution of 0.535 mol/L before use.

## Product Description :

Wine is a general term for alcoholic (ethanol) beverages, and ethanol is the main component of wine and one of the important indicators to measure the quality of wine. Ethanol can be used in the manufacture of acetic acid, beverages, flavors, dyes, fuels, etc. Ethanol with a volume fraction of 70% to 75% is commonly used as a disinfectant in medicine. Ethanol has a wide range of uses in the chemical industry, medical and health, food industry, agricultural production and other fields.

Ethanol is oxidized under the catalysis of alcohol oxidase to produce hydrogen peroxide. Peroxidase catalyzes the oxidation of hydrogen peroxide to 4-aminoantipyrine to couple phenol to generate a colored compound with a characteristic absorption peak at 505nm. The change of the absorption peak at 505nm can be measured to reflect the ethanol content.

## Reagents and Equipment Required but Not Provided:

Spectrophotometer, desk centrifuge, constant temperature incubator/water bath, pipette, 1mL glass cuvette, mortar/homogenizer, ice and distilled water.

## Procedure

### I. Sample preparation:

- Tissue sample:** According to the proportion of tissue weight (g): distilled water (mL) of 1:5-10 to extract. It is suggested that 0.1 g of tissue with 1 mL of distilled water and fully homogenized on ice bath. Centrifuge at 8000  $\times$ g for 10 minutes at 4°C to remove insoluble materials and take the supernatant on ice before testing.
- Liquid sample:** Detect directly. If the liquid is cloudy, the supernatant can be collected after centrifugation.

## II. Determination procedure:

1. Preheat spectrophotometer for 30 minutes, adjust wavelength to 505 nm, set zero with distilled water.
2. Add reagents with the following list:

Reagent (μL)	Test tube(t)	Standard tube(s)	Blank tube(b)
Reagent I	50	50	50
Reagent II	450	450	450
Reagent III	450	450	450
Sample	50	-	-
Standard	-	50	-
Distilled water	-	-	50

Mix thoroughly, immediately measure the absorbance value A1 at 505nm, then put the cuvette and the reaction solution in 37°C (mammal) or 25°C (other species) water bath for 60 minutes, take it out and wipe it clean and immediately determine its the absorbance value A2 in 60min. Calculate  $\Delta A_t = A_{2t} - A_{1t}$ ,  $\Delta A_s = A_{2s} - A_{1s}$ ,  $\Delta A_b = A_{2b} - A_{1b}$ . Blank tube and standard tube only need to test once or twice.

If the number of samples is too large, reagent I, reagent II, and reagent III can be prepared into working solution in proportion.

## III. Calculations:

1. Sample weight

$$\begin{aligned}\text{Ethanol Content (mmol /g weight)} &= (\Delta A_t - \Delta A_b) \times C \div (\Delta A_s - \Delta A_b) \times V_s \div (V_s \div V_e \times W) \times F \\ &= (\Delta A_t - \Delta A_b) \times 0.535 \div (\Delta A_s - \Delta A_b) \div W \times F\end{aligned}$$

2. Liquid volume

$$\begin{aligned}\text{Ethanol Content (mmol / L)} &= (\Delta A_t - \Delta A_b) \times C \div (\Delta A_s - \Delta A_b) \times F \times 1000 \\ &= (\Delta A_t - \Delta A_b) \div (\Delta A_s - \Delta A_b) \times F \times 535\end{aligned}$$

$V_S$ : Add sample volume, 0.05 mL;

$V_E$ : Extract solution volume, 1 mL;

W: Sample weight, g;

C: Standard tube concentration, 0.535 mmol/mL;

F: Dilution ratio;

1000: Unit conversion factor, 1mL=0.001L.

## Note:

1. If the measured absorbance value  $\Delta A > 0.5$ , it is recommended to dilute the sample before measuring, and multiply the dilution factor in the calculation formula; if the measured absorbance value is low or close to the blank OD value, it is recommended to increase the sample volume before performing the measurement.
2. If the number of samples is too large, reagent I, reagent II, and reagent III can be prepared into working solution in proportion.
3. It's better not to test too many samples to avoid affecting enzymatic reaction time.

**Experimental example:**

1. Take 0.1g rabbit liver, add 1 mL of distilled water, grind the homogenate with ice bath. Then operate according to the determination steps, calculate  $\Delta A_t = A_{2t} - A_{1t} = 0.080 - 0.028 = 0.052$ ,  $\Delta A_s = A_{2s} - A_{1s} = 0.535 - 0.016 = 0.519$ ,  $\Delta A_b = A_{2b} - A_{1b} = 0.010 - 0.006 = 0.004$ . The result is calculated according to the sample weight:

Ethanol Content (mmol /g weight) =  $(\Delta A_t - \Delta A_b) \times 0.535 \div (\Delta A_s - \Delta A_b) \div W \times F = 0.499$  mmol /g weight

2. Take 50  $\mu$ L of perfume, dilute 5times with distilled water and operate according to the determination steps, calculate  $\Delta A_t = A_{2t} - A_{1t} = 0.815 - 0.152 = 0.663$ ,  $\Delta A_s = A_{2s} - A_{1s} = 0.535 - 0.016 = 0.519$ ,  $\Delta A_b = A_{2b} - A_{1b} = 0.010 - 0.006 = 0.004$ . The result is calculated according to liquid volume:

Ethanol Content (mmol /L) =  $(\Delta A_t - \Delta A_b) \div (\Delta A_s - \Delta A_b) \times F \times 535 = 3423.0$  mmol /L

**Related Products:**

- BC0750/BC0755 Aldehyde Dehydrogenase(ALDH) Activity Assay Kit
- BC1080/BC1085 Alcohol Dehydrogenase (ADH) Activity Assay Kit
- BC2230/BC2235 Lactic Acid(LA) Content Assay Kit

