Determination of formaldehyde content in glyoxal sapmle(LC)

1. Instrument
   1) Liquid chromatograph
   2) Chromatographic column: kmicail (C-18) ODS 250 mm*4.6 mm*5 um
   3) Volumetric flask: 10 mL, 100 mL, 1000 mL,
2. Chromatographic condition:
   flow velocity:1.0 mL/min, wavelength: 360 nm; acetonitrile: water=60:40
3. Materials
   1) 2,4-dinitrophenylhydrazine in acetonitrile(0.005 mol/L): 1 g of 2,4-dinitrophenylhydrazine (AR) is dissolved in acetonitrile (1000 mL)
   2) Sodium acetate buffer solution(pH=4.8): 2.572 g of sodium hydroxide is added into acetic acid aqueous solution (5.7 mL glacial acid dissolved in 1000 mL water).
4. Measuring procedures:
   1) Formaldehyde standard control solution: 1.00 mL formaldehyde solution (37%) 1.00 mL is added into 100 ml volumetric flask, then dilute with water to the mark, and shake the flask well before using it.
   2) The sample solution: 1.00 mL glyoxal sample is added into 10 mL volumetric flask, and dilute with water to the mark.
   3) Measuring: 10 uL each of the soluton 1) and 2) is added into 5 mL triangular flask, respectively. Then add sodium acetate buffer(1 mL) and 2,4-dinitrophenylhydrazine acetonitrile solution (1 mL), shake it up and put the triangular flask into water bath (60 ^{o}C) for 20 min. After cooling down to room temperature, the formaldehyde standard solution and the sample solution is injected into chromatography injector, respectively, yielding formaldehyde peak, and compute:

$$\text{Formaldehyde content\%} = \frac{A1 \times d0 \times 37\% \times 1/100 \times 100\%}{A0 \times d1 \times 1/10}$$

In the formulation: A_1—the peak area of formaldehyde in the sample

d_0—the density of formaldehyde standard solution, g/mL

A_0—the peak area of formaldehyde in the standard solution

d_0—the density of glyoxal solution, g/mL