Oxalaldehyde product test

1. **Appearance**

   Check with naked eyes and the solution with 40 percent of Oxalaldehyde should be colorless or yellowish.

2. **Chrominance determination**

1) Preparation of standard solution with 500 Hazen Pt-Co

   Dissolve 2.000g $CoCl_3$ and 2.491g K_2PtCl_6 in little water, then add 200ml HCl into such a solution and dilute it with water to make a 2000-ml solution. Shake well.

   Cuvette is used to test the absorbency of standard solution with water as reference in the range of visible light. The results are shown in following table.

Table.1

Wave length, nm	absorbency
430	0.110-0.120
455	0.130-0.145
480	0.105-0.120
510	0.055-0.065

   The standard solution with 500 Hazen Pt-Co should be kept in brown sealed bottle exposed to no light for 6 months. When out of date, it can be used if the absorbency matches the above data sheet.

2) Preparation of dilute standard solution

   Draw different volumes of 500 Hazen units Pt-Co standard solution, dilute to 50 mL, then Pt-Co standard solution with different Hazen units are obtained.

   The volume numbers are listed in Table 2. 500 Hazen units Pt-Co standard solutions are transferred to nine sets of colorimetric tube, diluted with water to 50 Ml, and shake them up.

   Dilute Pt-Co standard solution is unstable, prepare it before using.

Table 2

Pt-Co standard solution（APHA）	5	10	15	20	25	30	35	40	50
Volume of 500 Hazen unit standard solution（mL）	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0

3) Colorimetric operation

   Inject 50 Ml sample solution into the colorimetric tube, on white background, along the colorimetric tube axis direction compare the sample solution and the standard solution by visual colorimetric method. When consistent with the standard color, the standard color is the color of the sample. If the sample color is between the two standards, take a larger color.

3. Acidity measurement

   Sodium hydroxide standard titration solution: c (NaOH)=0.1 mol/L

   Bromine thyme phenol blue indicator: 1 g/L

   Weigh accurately about 1.000 g sample, and dissolve in 20 Ml water in triangular

flask. Add 3-4 drops of bromine thyme phenol blue indicator, titrated with sodium hydroxide standard titration solution to slightly blue end.

Make a blank test at the same time.

$$\text{Acidity (calculated by CH3COOH), \%} = \frac{0.060\ C\ (V-V_0)}{m} * 100$$

In the formulation,

C—the actual concentration of sodium hydroxide standard titration solution, mol/L;

V---consumption volume of sodium hydroxide solution standard solution, mL;

V_0---consumption volume of sodium hydroxide solution standard solution in the blank test, mL;

m—the quality of the sample, g

0.060---the mass in grams of acetic acid equivalent to the 1.00 Ml sodium hydroxide standard titration solution [c(NaOH)= 0.1 mol/L]

4. Determination of oxalaldehyde content

KOH aqueous solution: c(KOH)=1.5 mol/L

HCl standard titration solution: c(HCl)=0.5 mol/L

Add 10 mL KOH solution, left for 10-15 min after shaking. HCl solution is titrated to the solution from blue to yellow namely as the end point.

$$\text{oxalaldehyde，\%} = \frac{0.05804\ C\ (V_0—V)}{m} \times 100$$

In the formulation:

C--- the actual concentration of HCl standard solution, mol/L

V---consumption volume of HCl solution standard solution in the titration of sample solution, Ml;

V_0---consumption volume of HCl solution standard solution in the blank test, Ml;

m---the quality of sample, g;

0.05804--the mass in grams of oxaladehyde equivalent to the 1.00 mL HCl standard solution [c(HCl)= 0.1 mol/L]

Discussion: determination of the four technical instructions can achieve the requirements of most users. But there are few customers may also ask for the content of impurities sulfate, chloride, methanol, formaldehyde, glyoxal products. Sulfate, chloride can be measured with a reagent standards, but the content of methanol, formaldehyde cannot get accurate results with the general capacity analysis. It is recommended to use gas chromatography.