GL Sciences

INSTRUCTION MANUAL
CHLOROFORM DETECTOR TUBE

No.152S

★ READ CAREFULLY THIS INSTRUCTION MANUAL AND THE INSTRUCTIONS OF THE ASPIRATING PUMP PRIOR TO USING THIS PRODUCT.
★ DO NOT DISCARD THIS INSTRUCTION MANUAL UNTIL ALL THE TUBES IN THIS BOX ARE USED UP.

1. PERFORMANCE:

Measuring Range and Pump Stroke	: 70 - 500 ppm (*) : 2 pump strokes	35 - 250 ppm 3 pump strokes	23 - 167 ppm 4 pump strokes
(*) Graduations on the detector tube are based on 2 pump strokes.			
Sampling Time	: 3 minutes	4.5 minutes	6 minutes
Colour Change	: White → Yellowish Orange		
Detectable Limit	: 20 ppm (4 pump strokes)		
Operating Temperature	: 10 - 40 ℃ (50-104°F) (Temperature correction is necessary.)		
Operating Humidity	: No correction is necessary up to 80%R.H. at 30 ℃.		
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A		

⚠CAUTION
1. THE DETECTOR TUBE AND PRETREAT TUBE CONTAIN CHEMICAL REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES WERE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

NOTICE
1. USE ONLY WITH PUMP MODELS AP-20, AP-20S, 400B, AP-1, AP-1S OR 400A. OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS. (**REFER TO ITEM 8. INSPECTION OF ASPIRATING PUMP**) ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
3. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
4. STORE TUBES IN A REFRIGERATED PLACE (0-10 ℃/32-50°F), AND USE BEFORE EXPIRATION DATE PRINTED ON THE TOP OF THE BOX.
5. PRIOR TO USE, READ CAREFULLY **ITEM 9. USER RESPONSIBILITY**.
6. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.

2. SAMPLING AND MEASUREMENT:

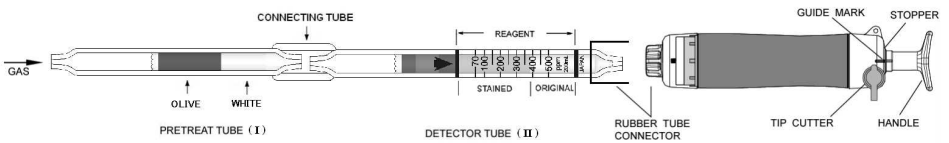

Fig.1

① Break both ends of the detector tube (Ⅱ) and pretreat tube (Ⅰ), and connect each end of the detector tube and pretreat tube with connecting tube as shown in Fig.1.

⚠CAUTION SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.

② Insert the detector tube into the aspirating pump securely as shown in Fig.1. (Arrow mark shall point to the pump.)
③ Align the guide marks on the shaft and stopper of the aspirating pump.
④ Pull the pump handle at a full stroke until it locks and wait for 1.5 minutes or until the completion of sampling is confirmed with the flow indicator of the pump. (See descriptions about the flow indicator in the instruction manual of the pump.)
⑤ Push back the handle without removing the detector tube from the rubber tube connector so that air in the pump will be discharged perfectly. Then repeat the step ③～④ once more.
⑥ On completion of sampling, read the scale at the maximum point of the stained layer.
⑦ When the concentration is below the scale range, 3 or 4 pump strokes can be used to determine concentrations of 35 to 250 ppm or 23 to 167 ppm. Then multiply the reading value by 1/2 or 1/3 respectively after temperature correction.

SPECIAL NOTE: Ⅰ. The scale is calibrated at 20 ℃ (68°F), 50 %R.H. and 1013 hPa. Readings obtained in other circumstances should be corrected. (**REFER TO ITEM 3. CORRECTION FOR AMBIENT CONDITIONS.**)

Ⅱ. When the maximum point of the stained layer is unclear or oblique, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

① Temperature; Correct the tube reading by following temperature correction table.

Temperature Correction Table

Tube Readings (ppm)	Corrected Concentration (ppm)				
	10 ℃ (50°F)	15 ℃ (59°F)	20 ℃ (68°F)	30 ℃ (86°F)	40 ℃ (104°F)
500	-	-	500	335	260
400	-	520	400	280	215
300	590	390	300	215	165
200	380	260	200	145	115
100	180	130	100	80	65
70	120	85	70	60	50

② Humidity; No correction is necessary up to 80%R.H. at 30 ℃.

③ Atmospheric Pressure; = Temperature corrected concentration $\times \frac{1013}{\text{Atmospheric pressure (in hPa)}}$

4. INTERFERENCES:

Halogens or Halogenated hydrocarbons produce a similar stain and give higher readings. Hexane does not change the colour of the reagent by itself, but the coexistence of more than 200ppm of Hexane gives lower readings.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

$CHCl_3 + I_2O_5 + CrO_3 + H_2S_2O_7 \rightarrow Cl_2$

6. DISPOSAL OF TUBES:

USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. HAZARDOUS AND DANGEROUS PROPERTIES OF CHLOROFORM:

TLV-TWA ◆ : 10ppm

Explosion range in air : -

◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2009.

8. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

① Insert a sealed, unbroken detector tube into the pump.

② Align the guide marks on the shaft and stopper of the pump.

③ Pull the handle to a full stroke and wait for 1 minute.

④ Unlock the handle and allow it to return slowly into the pump by holding the cylinder and handle securely.

⚠CAUTION HANDLE WILL TEND TO SNAP BACK INTO THE PUMP QUICKLY.

⑤ If the handle returns completely to the original position, the performance is satisfactory. Otherwise, refer to maintenance procedures shown in the instruction manual of the pump to correct the leakage.

9. USER RESPONSIBILITY:

It is the sole responsibility of the user of this equipment to ensure that the equipment is operated, maintained, and repaired in strict accordance with these instructions and the instructions provided with each Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour change different to that stated in the Performance specifications.

The Manufacturer and Manufacturer's Distributors shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.

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