KITAGAWA
KOMYO RIKAGAKU KOGYO

INSTRUCTION MANUAL
CHLORINE DETECTOR TUBE

No.109SB

★ 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 Sampling Time	: 0.5-10.0ppm (*) : 1 minute	0.125-2.5ppm 4 minutes	0.1-2ppm 5 minutes
(*) Graduations on the detector tube are based on 1 pump stroke.			
Number of pump stroke	: 1 (100mL)	4 (400mL)	5 (500mL)
Colour Change	White → Pale orange		
Detectable Limit	: 0.06 ppm (5 pump strokes)		
Operating Temperature	: 0 - 40 ℃ (32-104°F) (No temperature correction is necessary.)		
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A		

⚠CAUTION
1. DETECTOR TUBE CONTAINS REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE 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 COOL AND DARK PLACE (0-25 ℃/32-77°F), AND USE BEFORE EXPIRATION DATE PRINTED ON 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:

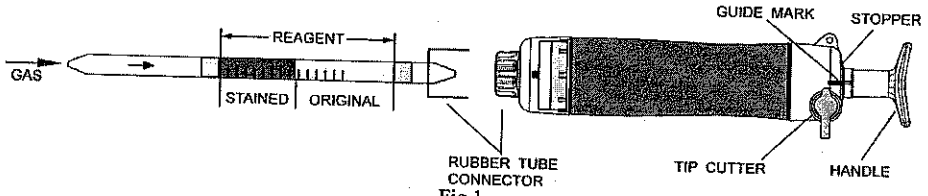


Fig.1

① Break both ends of the detector tube.
⚠CAUTION SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.
② Insert the detector tube into 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 full stroke locked position and wait for 1 minute or until the completion of sampling is confirmed with the flow indicator of the pump (See descriptions about the flow indicator in the instructions of the pump).
⑤ On completion of sampling, read the scale at the maximum point of the stained layer.
⑥ In case that the concentration is less than 0.5 ppm, turn the pump handle right or left by 1/4 (90°), push it toward the pump without removing the detector tube from the pump inlet, turn it right or left by 1/4 (90°) and repeat the steps ③ to ④ 3 or 4 times.
⑦ In case of these 4 or 5 pump strokes, the following formula is available for true concentrations.

$$\text{True concentration} = \text{Tube reading} \times \frac{1}{\text{Number of pump strokes}}$$

SPECIAL NOTE:
I. The scale is calibrated at 20 ℃ (68°F), 50 %R.H. and 1013hPa. 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 obliquely, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

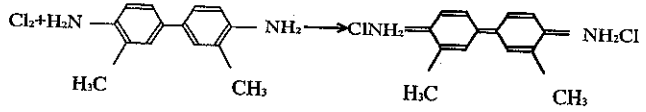
① Temperature; No correction is necessary
② Humidity; No correction is necessary. [10 ~ 90 %R.H. at 30 ℃ (86°F)].
③ Atmospheric Pressure;

$$\text{True concentration} = \text{Tube reading} \times \frac{1013}{\text{Atmospheric pressure (in hPa)}}$$

4. INTERFERENCE:

Bromine or Chlorine dioxide produces a pale yellow stain and each coexistence of more than 1ppm with Chlorine respectively will give higher reading. Nitrogen dioxide or trichloride produces a pale yellow stain and the coexistence of Nitrogen dioxide (more than 1/5 times of Chlorine concentration) or 5 ppm of Nitrogen trichloride with Chlorine respectively will give higher reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBE:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF CHLORINE:

TLV-TWA ◆ : 0.5 ppm
Explosive range in air : —
◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2004.

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 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 procedure 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.

IME1091/1

Printed in Japan