KITAGAWA
KOMYO RIKAGAKU KOGYO

INSTRUCTION MANUAL
ETHYLENE DETECTOR TUBE
- COLOUR INTENSITY -

No.108B

★ 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	:	0.5 - 100 ppm	0.1 - 20 ppm
and Sampling Time	:	2 minutes	10 minutes
Number of pump strokes	:	1 (100 mL)	5 (500 mL)
Colour Change	:	Pale Yellow → Blue	
Detectable Limit	:	0.01 ppm (5 pump strokes)	
Operating temperature	:	0 - 40 ℃ (32-104°F) (No 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:

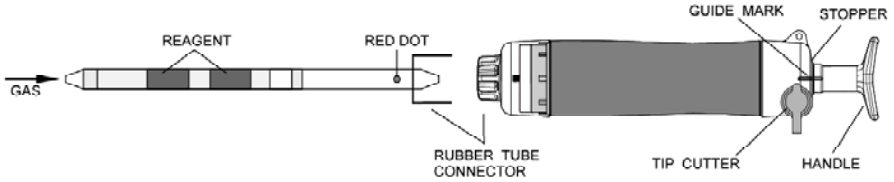

Fig.1

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. (Red dot 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 2 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 On the completion of sampling, remove the detector tube from the rubber tube connector and compare the discolouration of reagent in the detector tube with the colour standard chart attached to obtain the concentration.
⑥ In case of 5 pump strokes (500 mL), without removing the detector tube from the pump inlet after the aforesaid step ④, turn the pump handle right or left by 1/4 (90°), push it toward the pump, turn it right or left by 1/4 (90°) and repeat the aforesaid steps ③ to ④ another 4 times.
⑦ On completion of sampling, remove the detector tube from the rubber tube connector and compare the discolouration of reagent in the detector tube with the colour standard chart attached to obtain the concentration.

SPECIAL NOTE: This tube 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**).

3. CORRECTION FOR AMBIENT CONDITIONS:
① Temperature; No correction is necessary
② Humidity; No correction is necessary at 20 ～ 90 % R.H.
③ Atmospheric Pressure;

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

4. INTERFERENCE:
High concentration of Hydrogen or Saturated Hydrocarbons will produce a similar discolouration and will give higher concentration than actual one. Acetylene will produce a deep blue discolouration, Carbon monoxide will produce a green or a similar discolouration, Hydrogen sulphide will produce a black discolouration, Hydrogen cyanide will produce a white discolouration and all of these gases will show lower concentrations than actual ones. Benzene, Carbon disulphide, Chlorine or Nitrogen dioxide will produce a yellowish orange or a dark yellow discolouration. Ammonia will produce a white discolouration and will give lower reading than actual one.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

$$H_2C{=}CH_2 + PdSO_4 + (NH_4)_2MoO_4 \rightarrow Mo_3O_8$$

6. DISPOSAL OF TUBE:
USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. HAZARDOUS AND DANGEROUS PROPERTIES OF ETHYLENE:
TLV-TWA.◆ : —
Explosive range in air : 2.7 - 36 %
◆ 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.

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