KITAGAWA
KOMYO RIKAGAKU KOGYO

INSTRUCTION MANUAL
CARBON DISULPHIDE DETECTOR TUBE

No.141SB

★ 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	: 2 - 50 ppm (*)	0.8 - 20 ppm
and Sampling Time	: 4 minutes	8 minutes

(*) Graduations on the detector tube are based on 2 pump strokes.

Number of Pump Strokes	: 2 (200mL) 4 (400mL)
Colour Change	: Pink → Yellow
Detectable Limit	: 0.3 ppm (4 pump strokes)
Operating temperature	: 0 - 40 ℃ (32-104°F) (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. PRETREAT TUBE CONTAINS REAGENTS (CHROMIUM).
3. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
4. 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 REFRIGERATED PLACE NOT TO EXCEED 10 ℃ (50°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:

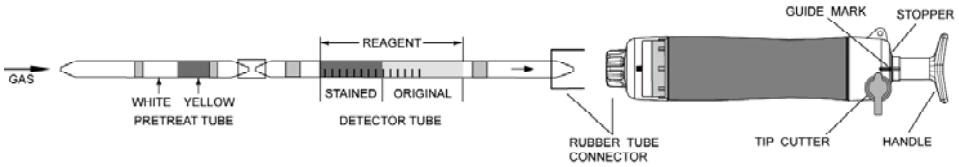

Fig.1

① Break both ends of the detector tube and pretreat tube, and connect each end of the detector tube and pretreat tube with rubber tube connector 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 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 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 Turn the handle right or left by 1/4 (90°), push it toward to the pump without removing the detector tube from the pump inlet and then repeat the step ④ once again.
⑥ On completion of sampling, read the scale at the maximum point of the stained layer.
⑦ In case of 4 pump strokes, after the above ① to ④, turn the handle right or left by 1/4 (90°), push it toward to the pump without removing the detector tube from the pump inlet and then repeat the step ③ to ④ three times more.
⑧ On completion of sampling, read the scale at the maximum point of the stained layer and multiply the reading value after temperature correction undermentioned, by 0.4.

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; Correct the tube reading by following temperature correction table.

Temperature Correction Table					
Tube Readings (ppm)	Corrected Concentration (ppm)				
	0 ℃ (32°F)	10 ℃ (50°F)	20 ℃ (68°F)	30 ℃ (86°F)	40 ℃ (104°F)
50	72	59	50	43	38
45	65	54	45	39	34
40	58	48	40	34	30
35	51	42	35	30	26
30	44	36	30	26	22
25	37	30	25	21	18
20	31	25	20	17	14
15	24	19	15	13	10
10	16	12	10	8	7
5	9	7	5	4	3
2	3	3	2	2	1

② Humidity; No correction is necessary.
③ Atmospheric Pressure ;

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

4. INTERFERENCE.

More than 15ppm of Sulphur dioxide produces similar stains and coexistence with Carbon disulphide will give higher reading. More than 100ppm of Hydrogen sulphide produces similar stains and coexistence of more than 120ppm with Carbon disulphide will give higher reading. Chlorine produces pale pink stains and coexistence with Carbon disulphide will give higher reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

$CS_2+CrO_3+H_2SO_4 \rightarrow SO_2$
$SO_2+2NaOH \rightarrow Na_2SO_3+H_2O$

6. DISPOSAL OF TUBE:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF CARBON DISULPHIDE :

TLV-TWA ◆ : 10 ppm
Explosive range in air : 1.0 - 60 %
◆ Threshold Limit Value established by 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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