KITAGAWA
KOMYO RIKAGAKU KOGYO

INSTRUCTION MANUAL
HYDROGEN SULPHIDE DETECTOR TUBE

No.120SE2

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

1. PERFORMANCE:

Measuring Range and Pump Stroke	: 2 - 40ppm : 1/2 pump stroke	1 - 20ppm (*) 1 pump stroke	0.5 - 10ppm 2 pump strokes

(*) Graduations on the detector tube are based on a 1 pump stroke.

Sampling Time	: 0.5 minutes	1 minute	2 minutes
Colour Change	: Pale Brown → Pink		
Detectable Limit	: 0.05ppm (2 pump strokes)		
Operating Temperature	: 0 - 40 ℃ (32-104°F) (Temperature correction is necessary.)		
Aspirating Pump	: Model AP-20, AP-20S, AP-1 or AP-1S		

⚠CAUTION

1. THE DETECTOR TUBE CONTAINS CHEMICAL REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES WERE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.
4. IF THE CONCENTRATION IS OVER THE FULL SCALE, THE HIGH CONCENTRATION OF HYDROGEN SULPHIDE REMAINS IN THE ASPIRATING PUMP. BE CAREFUL NOT TO BREATHE THE REMAINING GAS. AFTER MEASUREMENT, THE REMAINING GAS IS PUSHED OUT FROM THE BOTTOM CASE OF THE PUMP (FROM A IN FIG.1) WHEN THE HANDLE IS PUSHED BACK AND PULLED. IN CASE OF THE ABOVE, PUSH BACK AND PULL THE HANDLE WITHOUT CONNECTING THE TUBE AT THE LOCAL EXHAUST VENTILATION DEVICE. REPEAT THIS OPERATION AT LEAST FIVE TIMES IN ORDER TO REMOVE THE REMAINING GAS.

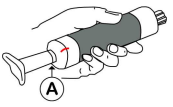

Fig.1

NOTICE
1. USE ONLY WITH PUMP MODELS AP-20, AP-20S, AP-1 or AP-1S. 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 THE TOP OF THE BOX.
5. PRIOR TO USE, READ **ITEM 9. USER RESPONSIBILITY** CAREFULLY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER DRAWING THE SAMPLE.

2. SAMPLING AND MEASUREMENT:

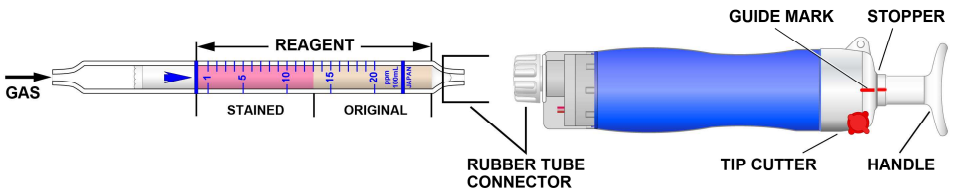

Fig.2

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 the aspirating pump securely as shown in Fig.2. (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 minute or until the completion is confirmed with the flow indicator of the pump. (See descriptions about the flow indicator in the instruction manual of the pump.)
⑤ On completion of sampling, read the scale at the maximum point of the stained layer.
⑥ When the concentration is below the scale range, 2 pump strokes can be used to determine concentrations of 0.5 to 10 ppm.
Repeat the procedures ③ to ⑤ once more, then multiply the reading value by 0.5.
⑦ When the concentration is over the scale range, a 1/2 pump stroke can be used to determine concentrations of 2 to 40 ppm.
1) Remove the detector tube from the pump.
2) Turn the pump handle right or left by 1/4 (90°), push it toward to the pump.
3) Insert the new detector tube into the aspirating pump.
4) Pull the pump handle at a 1/2 stroke until it locks and wait for 30 seconds or until the completion of sampling is confirmed with the flow indicator of the pump.
5) On completion of sampling, read the scale at the maximum point of the stained layer.
6) Then multiply the reading value by 2.

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 oblique, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

① Temperature; The scale is calibrated based on the temperature of 20 ℃ (68 ℉). Reading obtained in other temperature circumstances should be corrected with the following temperature correction table.

Table of the coefficient for temperature correction (based on 20 ℃)

Temperature (℃)	0	10	15	20~25	30	40
Correction Factor	0.7	0.85	0.93	1.0	1.1	1.2

Procedure of temperature correction: Actual readings can be obtained by multiplying the readings of tubes by coefficient for temperature correction shown in the above. Therefore,

Actual Hydrogen sulphide concentration (ppm) =
Reading value (ppm) × Coefficient for temperature correction

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

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

4. INTERFERENCE:

Phosphine, Mercaptan, Arsine or Hydrogen selenide produces a similar stain and gives higher readings. Hydrogen cyanide produces a similar stain and coexistence of more than 0.1 ppm with Hydrogen sulphide gives higher readings . Nitrogen dioxide does not change the colour of the reagent by itself, but coexistence of more than 1 ppm with Hydrogen sulphide gives lower readings. Ammonia does not change the colour of the reagent by itself, but coexistence of more than 15 ppm with Hydrogen sulphide fades the discoloured layer from the zero end of the detection reagent (on the inlet side of the tube) in the case of 2 pump strokes. Less than 40 ppm Sulphur dioxide, less than 30 ppm Hydrogen fluoride, less than 20 ppm Nitric acid or Hydrogen chloride does not affect the reading.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:

By reacting with Silver compound, acid gas is produced and pH indicator is discoloured.

6. DISPOSAL OF TUBES:

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

7. HAZARDOUS AND DANGEROUS PROPERTIES OF HYDROGEN SULPHIDE:

TLV-TWA ◆ : 1 ppm
Explosion range in air : 4.0 - 45.5 %
◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2024.

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, AP-1 or AP-1S aspirating pump, and that detector tubes are not used 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.

※ Product specifications are subject to change without any prior notice.

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