



Section	Original Colour
A	Pale purple
B	Reddish purple
C	White
D	White
E	Yellow

## 1. SPECIFICATIONS

- 1) Substances to be detected : Acetic acid, Amines, Ammonia, Carbon monoxide, Chlorine, Hydrogen chloride, Hydrogen sulphide, Nitrogen dioxide, Phosphine, Sulphur dioxide, \* Acetylene and \* Methyl mercaptan (\*: Organic gas)
- 2) Tube per box : 10 tubes (10-time use)
- 3) Pump stroke : 1 (100mℓ)
- 4) Sampling time : 20 seconds
- 5) Shelf life : 1 year
- 6) Operating temperature : 0 ~ 40 °C
- 7) Colour change : Refer to following "3. DISCOLOURATION / QUALITATIVE CHART"
- 8) Non-discolouration confirmed substances : Carbon dioxide, Hydrogen cyanide, Nitric oxide and \* Ethylene (\*: Organic gas)

## 2. CHEMICAL REACTION

### SECTION

### CHEMICAL REACTION PRINCIPLES

- A By reacting with Phosphoric acid, PH indicator is discoloured.  
 $2\text{NH}_3 + \text{H}_3\text{PO}_4 \rightarrow (\text{NH}_4)_2\text{HPO}_4$
- B By reacting with an Alkaline, PH indicator is discoloured.  
 $\text{SO}_2 + 2\text{NaOH} \rightarrow \text{Na}_2\text{SO}_3 + \text{H}_2\text{O}$
- C By reacting with o-Toluidine, Nitro-o-Toluidine (Dyestuff) is liberated.
- D By reacting with Lead Acetate (II), Lead sulphide is produced.  
 $\text{H}_2\text{S} + \text{Pd}(\text{CH}_3\text{COO})_2 \rightarrow \text{PdS} + 2\text{CH}_3\text{COOH}$
- E Potassium disulphide palladate (II) is reduced and Palladium is liberated.  
 $\text{CO} + \text{K}_2\text{Pd}(\text{SO}_3)_2 \rightarrow \text{K}_2(\text{SO}_3)_2\text{PdCO}$   
 $\text{K}_2(\text{SO}_3)_2\text{PdCO} \rightarrow \text{CO}_2 + \text{SO}_2 + \text{K}_2\text{SO}_3$

### 3. DISCOLOURATION / QUALITATIVE CHART

#### CHART 1. INORGANIC GAS QUALITATIVE QUALITATIVE DETECTION CHART

Selection (Original Colour)					* 1) Substances (* 2)
A (Pale purple)	B (Reddish purple)	C (White)	D (White)	E (Yellow)	
Yellow	—	—	—	—	1) Ammonia (5) 2) Amines (5)
	Yellow	—	—	—	3) SO <sub>2</sub> (10) 4) Acetic Acid (15)
	Pink	—	—	—	5) Hydrogen chloride (20)
	White	Yellowish orange	—	—	6) Chlorine (5)
	—	Yellow	—	—	7) Nitrogen dioxide (5)
		—	Brown	—	8) H <sub>2</sub> S (10)
				Pale blackish brown	9) CO (10)
				Dark black	10) Phosphine (2)
				Pale Yellowish green	11) Acetylene (10)
				Dark yellow	12) Methyl mercaptan (10)

#### NOTES : —

(1) — : Undiscoloured

(2) (\* 1) : Item No. for quick reference to details in CHART

(3) (\* 2) : Detectable gas concentration limit of the substance (Unit : ppm)

The discolouration length is approx. 0.5 to 1.0 mm.

(4) Substance No. 4, 11 and 12 are organic substances.

**CHART 2. CHART FOR GAS-CONCENTRATION LEVEL AND DISCOLOURATION**

INORGANIC SUBSTANCES	GAS CONCEN TRATION (PPM)	SECTION				
		A (Pale purple)	B (Reddish purple)	C (White)	D (White)	E (Yellow)
1) Ammonia	50 5	Yellow (I) Yellow (III)	_____	_____	_____	_____
2) Amines	50 5	Yellow (I) Yellow (III)	_____	_____	_____	_____
3) Sulphur dioxide (SO <sub>2</sub> )	50 10	_____	Yellow (I) Yellow (III)	_____	_____	_____
4) Acetic Acid	30 15	_____	Yellow (II) Yellow (III)	_____	_____	_____
5) Hydrogen chloride	50 20	_____	Pink (II) Pink (III)	_____	_____	_____
6) Chlorine	20 5	_____	White (I) White & Pale purple (II)	Yellowish orange (I)	_____	_____
7) Nitrogen dioxide	20 5	_____	_____	Yellow (I) Yellow (I)	_____	_____
8) Hydrogen sulphide (H <sub>2</sub> S)	100 10	_____	_____	_____	Brown (II) Brown (II)	Brown (II)
9) Carbon monoxide (CO)	50 10	_____	_____	_____	_____	Blackish brown (I) Pale blackish brown (I)
10) Phosphine	30 2	_____	_____	_____	_____	Black (II) Pale black (III)
11) Acetylene	50 10	_____	_____	_____	_____	Yellowish green (I) Pale yellowish green (I)
12) Methyl mercaptan	100 10	_____	_____	_____	_____	Pale yellow (I) Dark yellow (II)

NOTES : —

1) ———: Undiscoloured

2) Discolouration level : I ; The whole layer is discoloured.

3) Sybstance No.4 , 11) and 12) are organic substances.

NON-DISCOLOURATION CONFIRMED SUBSTANCES

1) Hydrogen cyanide (HCN) 2) Carbon dioxide (CO<sub>2</sub>) 3) Ethylene (Organic substance) 4) Nitric oxide (NO)

II ; A half layer is discoloured. III ; Approx. 0.5-1.0mm of the layer is discoloured.