Tube No.
**131**

# INORGANIC GAS QUALITATIVE DETECTOR TUBE


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

## 1. PERFORMANCE

1) Substances to be detected : Acetic acid, Amines, Ammonia, Carbon monoxide, Chlorine, Hydrogen chloride, Hydrogen sulphide, Nitrogen dioxide, Phosphine, Sulphur dioxide, *Acetylene and *Metyl 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 : 3 years
6) Operating temperature : 0～40℃
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. $2NH_3 + H_3PO_4 \rightarrow (NH_4)_2HPO_4$ |
| B | By reacting with an Alkaline, pH indicator is discoloured. $SO_2 + 2NaOH \rightarrow Na_2SO_3 + H_2O$ |
| C | By reacting with o-Tolidine, Nitro-o-Tolidine (Dyestuff) is liberated. |
| D | By reacting with Lead Acetate (II), Lead sulphide is produced. $H_2S + Pb(CH_3COO)_2 \rightarrow PbS + 2CH_3COOH$ |
| E | Potasium disulphide palladate (II) is reduced and Palladium is liberated. $CO + K_2Pd(SO_3)_2 \rightarrow K_2(SO_3)_2PdCO$ $K_2(SO_3)_2PdCO \rightarrow CO_2 + SO_2 + K_2SO_3$ |

## 3. DISCOLOURATION / QUALITATIVE CHART

### CHART 1. INORGANIC GAS 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)<br>2) Amines (5) |
| — | Yellow | — | — | — | 3) $SO_2$ (10)<br>4) Acetic Acid (15) |
| | Pink | — | — | — | 5) Hydrogen chloride (20) |
| | White | Yellowish orange | — | — | 6) Chlorine (5) |
| | — | Yellow | — | — | 7) Nitrogen dioxide (5) |
| — | — | — | Brown | — | 8) $H_2S$ (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 | Yellow (I) | —— | —— | —— | —— |
| | 5 | Yellow (III) | —— | —— | —— | —— |
| 2) Amines | 50 | Yellow (I) | —— | —— | —— | —— |
| | 5 | Yellow (III) | —— | —— | —— | —— |
| 3) Sulphur dioxide ($SO_2$) | 50 | —— | Yellow (I) | —— | —— | —— |
| | 10 | —— | Yellow (III) | —— | —— | —— |
| 4) Acetic Acid | 30 | —— | Yellow (II) | —— | —— | —— |
| | 15 | —— | Yellow (III) | —— | —— | —— |
| 5) Hydrogen chloride | 50 | —— | Pink (II) | —— | —— | —— |
| | 20 | —— | Pink (III) | —— | —— | —— |
| 6) Chlorine | 20 | —— | White (I) | Yellowish orange (I) | —— | —— |
| | 5 | —— | White & Pale purple (II) | —— | —— | —— |
| 7) Nitrogen dioxide | 5 | —— | —— | Yellow (I) | —— | —— |
| 8) Hydrogen sulphide ($H_2S$) | 100 | —— | —— | —— | Brown (I) | Brown (II) |
| | 10 | —— | —— | —— | Brown (I) | —— |
| 9) Carbon monoxide (CO) | 50 | —— | —— | —— | —— | Blackish brown (I) |
| | 10 | —— | —— | —— | —— | Pale blackish brown (I) |
| 10) Phosphine | 30 | —— | —— | —— | —— | Black (II) |
| | 2 | —— | —— | —— | —— | Pale black (III) |
| 11) Acetylene | 50 | —— | —— | —— | —— | Yellowish green (I) |
| | 10 | —— | —— | —— | —— | Pale Yellowish green (I) |
| 12) Methyl mercaptan | 100 | —— | —— | —— | —— | Pale Yellow (I) |
| | 10 | —— | —— | —— | —— | Dark Yellow (II) |

NOTES : —

1) —— : Undiscoloured

2) Discolouration level : I ; The whole layer is discoloured. II ; A half layer is discoloured. III ; Approx. 0.5-1.0mm of the layer is discoloured.

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

NON-DISCOLOURATION CONFIRMED SUBSTANCES

1) Hydrogen cyanide (HCN) 2) Carbon dioxide ($CO_2$) 3) Ethylene (Organic substance) 4) Nitric oxide (NO)