



# YOUNG LIN APPLICATION LETTER

Application Note No. : YL-APP-2001001

**Subject : On-Line Analysis of Trace Level Impurities for Semi-Conductor Process Gases**

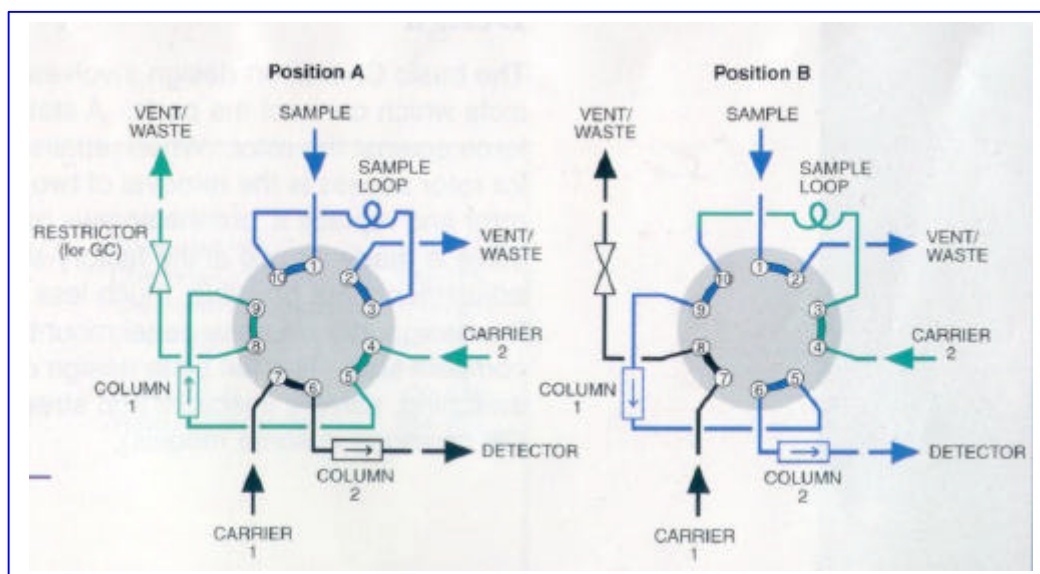
**Key Words : GC, PDHID, CSF<sub>8</sub>**

## 1 Introduction

Impurities of specialty gases used for semi-conductor manufacturing should be controlled in very trace level because its impurities such CH<sub>4</sub>, N<sub>2</sub>, O<sub>2</sub>, CO and CO<sub>2</sub> can take severe effect on semi-conductor quality. Young Lin GC with HID was applied to on-line control the impurities of CSF<sub>8</sub>.

## 2 Analytical Conditions

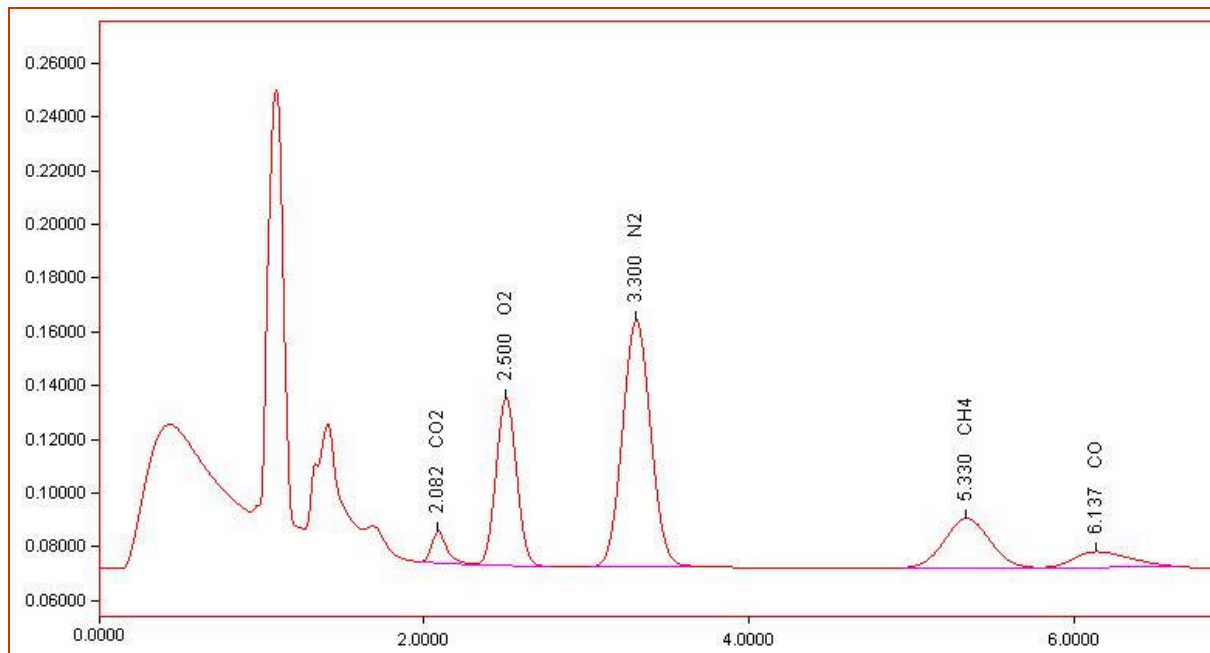
- Column 1 : Porapack Q
- Column 2 : CTR III(Alltech Inc.)
- Valve : Automatic 10-port vale
- Sample loop : 5 ml
- Detector : PD-HID(Valco Inc.)
- Oven temperature : 90 °C
- Detector temperature : 50 °C
- Column flow : 50 ml/min
- Valve on/off time : 0.1/1.4



<Figure 1> 10-port valve diagram of sampling and switching.

## Results

Impurities such as air, CH<sub>4</sub>, N<sub>2</sub>, O<sub>2</sub>, CO and CO<sub>2</sub> are analyzed at ppm-level as shown in <Figure 2>. As shown in the <Figure 2>, total analysis time is less than 7 minutes.



<Figure 2> Chromatogram for CSF<sub>8</sub> impurities.