



## **C<sub>1</sub> – C<sub>3</sub> amines**

# Analysis of volatile amines in DMA

## Application Note

Energy & Fuels

### **Authors**

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### **Introduction**

The mono-, di- and trimethylamine process streams are analyzed on-line as liquid gases. UCB, in co-operation with Agilent Technologies, developed a unique non-polar phase with an inert thick film of 5  $\mu\text{m}$  that separates and quantifies nitrogen, ammonia, monomethylamine, methanol, dimethylamine and trimethylamine. Traces of these products in the purified methylamines are quantified with detection limits of 10 - 50 ppm. The process GC perform about 250 injections a week of 1  $\mu\text{L}$  methylamines (as liquid gas).

Each process GC is equipped with two split injectors and two Agilent CP-Volamine capillary columns. Injections on both columns are done simultaneously; one column is connected to a FID detector, the other to a  $\mu\text{TCD}$  detector. The features of this new column are inertness towards amines, high temperature stability and long lifetime. The column inertness is reflected in the peak tailing and symmetry (the peak symmetry of MMA > 0.8). UCB gained with this column analysis speed, efficiency, accuracy and precision: key factors to control the quality of the pure methylamine and plant methylamine streams.



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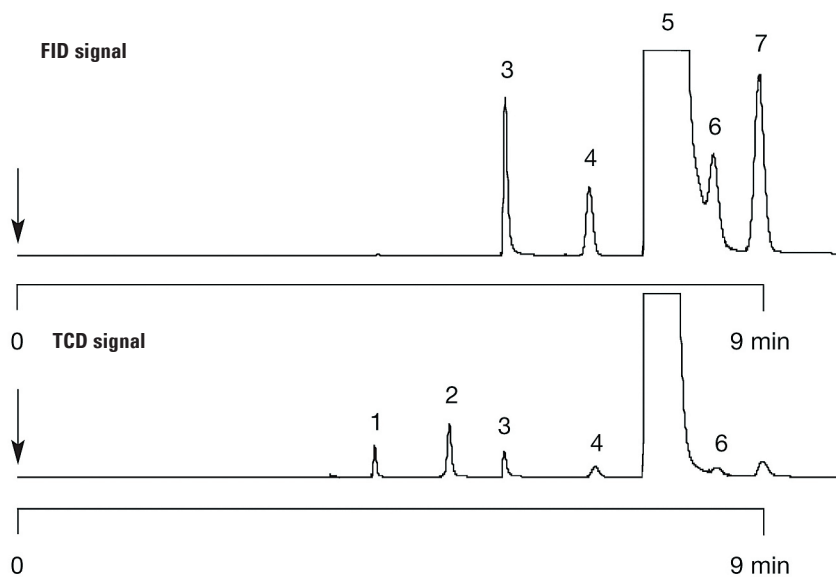
## Conditions

Technique : GC-capillary  
Column : Agilent CP-Volamine, 0.32 mm x 60 m fused silica WCOT (Part no. CP7448)  
Temperature : 40 °C (1 0 min) → 250 °C, 20 °C/min  
Carrier Gas : He, 100 kPa (1 bar, 14 psi)  
Injector : Split, 1:15  
T = 180 °C  
Detector : FID/TCD  
T = 250 °C  
Sample Size : 1 µL, liquid  
Solvent Sample : Bulk DMA

Courtesy : Dr. F. de Boever, UCB research center Drogenbos,  
Dr. G. Baele, UCB Gent  
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## Peak identification

|                               |          |
|-------------------------------|----------|
| 1. ammonia (NH <sub>3</sub> ) | 700 ppm  |
| 2. water                      | 2000 ppm |
| 3. methylamine (MMA)          | 585 ppm  |
| 4. methanol                   | 575 ppm  |
| 5. dimethylamine (DMA)        | bulk     |
| 6. ethylamine                 | 630 ppm  |
| 7. trimethylamine (TMA)       | 980 ppm  |



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