Nitrous oxide Analysis

Separation of CO_2 & N_2O (m/z 44) by using infiTOF

Introduction

Nitrous oxide (N_2O) is known as a greenhouse gas, and the warming effect is about 300 times larger than carbon dioxide (CO_2). Furthermore, N_2O is one of the ozone-depleting substances. So it is quite significant to monitor N_2O.
To carry out real-time monitoring of N_2O using mass spectrometry, a mass spectrometer with high mass resolution is required, because the nominal mass of N_2O is the same as that of CO_2. To separate CO_2 and N_2O doublet completely, the required mass resolution is about 10,000. Conventional quadrupole mass spectrometers (QMS) are incapable of this measurement because of low mass resolution.

infiTOF

The infiTOF system is compact, portable, and capable of achieving a resolving power of 30.000. High-resolution mass analysis of CO_2 and N_2O with infiTOF is possible.

Sample gas; Carbon dioxide (CO_2) and Nitrous oxide (N_2O) mixture gas
MS conditions; Ion source : EI(Pos), Ionization voltage : 70eV, Ion source Temperature : 250℃
Sample gas was introduced directly to the ion source through the fused silica capillary tube.

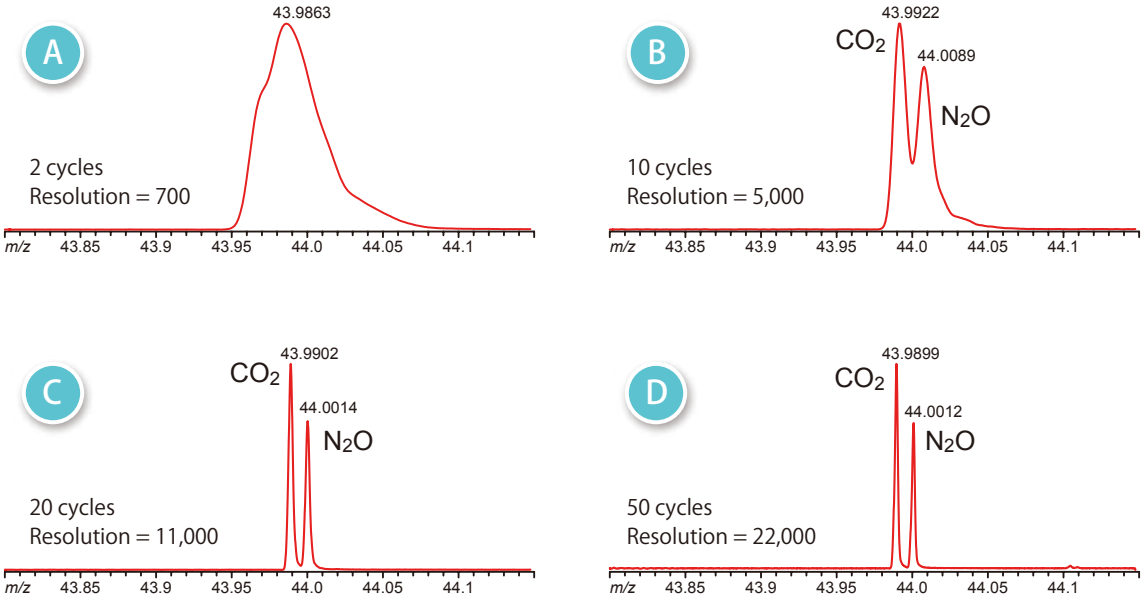

Fig. 1 Separation of CO_2 and N_2O doublet. (A) 2cycles, (B) 10cycles, (C) 20cycles and (D) 50cycles. At 100 cycles, mass resolution of 22,000 was achieved.

Conclusion

In the short flight length (2cycles, Fig.1A), the doublet was still unified. After 10 cycles, the doublet began to separate, but not yet completely separated (Fig. 1B). After 20 cycles, CO_2 and N_2O were clearly separated, and the obtained mass resolution was 11,000 (Fig.1C).After 50 cycles, the mass resolution of 22,000 was achieved (Fig.1D).

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The Ultimate Measurements

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