



GCMS Gas Chromatograph Mass Spectrometer

Analysis of Gas Generated from Lithium Ion Rechargeable Battery Cells

Electrolytic solutions in lithium ion rechargeable batteries consist of organic solvents (mainly composed of the carbonate series), electrolytes, and additives.

GC-MS systems are effective for the analysis of the denatured components of electrolytic solutions resulting from the charging and discharging of batteries. This article introduces a sample analysis of gas produced from a lithium ion rechargeable battery cell stored for 5 days at 80°C.

Experiment

Sample Extraction

A laminated aluminum battery was stored for 5 days at 80°C. The battery was then punctured directly by the tip of a gas tight syringe needle, and the gas compounds inside were collected.

Table 1: Analysis Conditions

GC-MS	:GCMS-QP2010 Ultra			
Column	:Rt-Q-BOND (30 mL. x 0.32 mml.D., 10 µm) + Guard column (3 mL. x 0.32 mml.D.)			
[GC] Vaporization char Column oven terr Injection mode Split ratio Carrier gas Control mode Sample injection		: 200 °C 35 °C (3 min) →(10 °C/min)→260 °C (5 min) : Split : 30 : Helium :Linear velocity (61.6 cm/sec) : 500 µL	[MS] Interface temper Ion source temp Measurement m Mass range Event time	erature: 200 °C

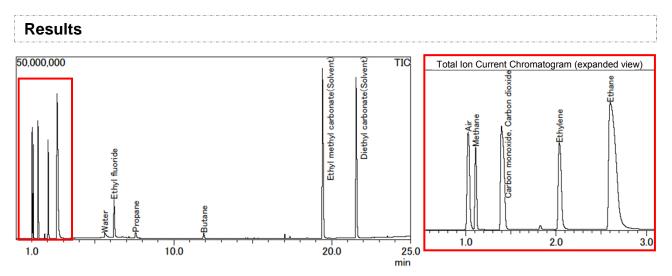


Fig. 1: Total Ion Current Chromatogram for Gas Generated from the Cell



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