

Gas Chromatograph



Year of Purchase - 2018

Cost - Rs. 22.36 Lac

The analysis of generated gases and reaction gases requires an optimized system. When evaluating the degradation of lithium ion rechargeable batteries, it is necessary to analyze the gases generated inside the battery. The structure of the gases and the quantity of each component can be investigated by injecting a sample of the internal gases into a gas chromatograph. For this analysis, a GC-2014 gas chromatograph with a dual analytical flow line configuration was used to measure inorganic gas components (O₂, N₂, CO, and CO₂) and light hydrocarbon components (CH₄, C₂H₄, C₂H₆, C₃H₆, and C₃H₈). The internal gas was sampled by inserting a gas-tight syringe into a structurally weak part of the lithium ion rechargeable battery, such as the pressure check valve. The sampled gas was diluted with a gas, such as argon, and then injected into the gas chromatograph. In analytical flow line 1, which utilizes a Porapak Q column, TCD and FID are connected in series, enabling the measurement of CO₂ and light hydrocarbons from a single injection.

Capable of High-Sensitivity Measurements at the Sub-ppm Level! Can also Accommodate Measurement Value Pressure Corrections:

In the splitting of water using a photocatalyst, high-sensitivity measurements of the H₂ and O₂ generated must be performed in order to evaluate the catalyst efficiency. The gases generated inside the reaction chamber are sampled automatically to avoid contact with the outside air, and then measured at high sensitivity using a PDD (pulsed discharge detector). Introduced here is an analysis system combining the GC-2014 gas chromatograph, which is equipped with a PDD, with an automatic sampling line.

Flow Channel Configuration

The system's flow channels are shown in the figures below (a and b). The inside of the measurement tube is evacuated using a pump. The sample gas is then aspirated from inside the reaction chamber into the measurement tube through the operation of a solenoid valve (a). Next, 6-way valve 2 switches over, and the sample gas in the measurement tube is injected into the analysis column. After analysis in the column, the gas is measured by the PDD (b). All of the operations, from sampling to measurement, are performed automatically. In addition, measurements can be performed with only a few mL of sample gas.

Features of the GC-2014

Excellent Expandability Can be equipped with up to three injection units and four detectors, and can accommodate both capillary and packed columns. Can accommodate a variety of analysis needs.

High-Level Basic Performance Incorporates high-end technology cultivated in our flagship models (the GC-2010 series). Achieves excellent repeatability and sensitivity.

Specifications

Features	Specifications
Option	Upgradable to 500°C
Operating Temperature	Ambient to 400°C
Temperature stability	+/-0.1 °C
Volume	13 Litre
Dimensions	25 Wx15 Dx35 H cm