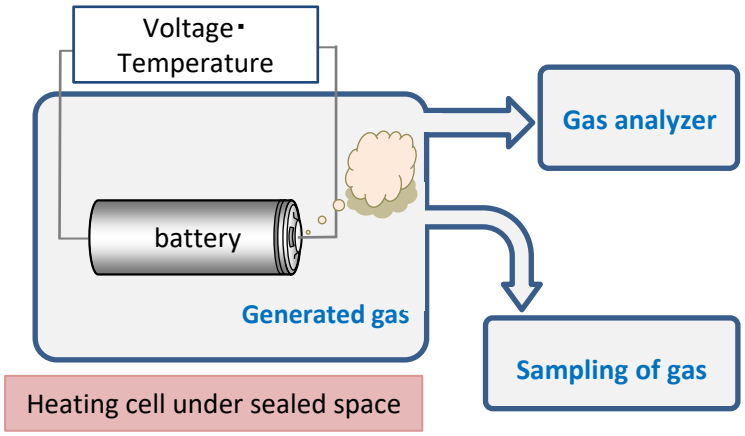
Gas analysis from LIB in heating test

LIB needs high safety with regard to electrical, mechanical and environmental factors.
Toray Research Center can conduct the real time analysis of gas with its compositional analysis during battery safety testing. Below is the analytic testing case using cylindrical battery.

Analytic flow of gas during heating test



Portable gas analyzer

Detectable elements:
CO_2, CO, O_2, SO_x, NO_x

Real time gas analyzer during heating test

GC, GC/MS, IC measurement
Detectable elements: organic, F^- etc

Compositional analysis is available

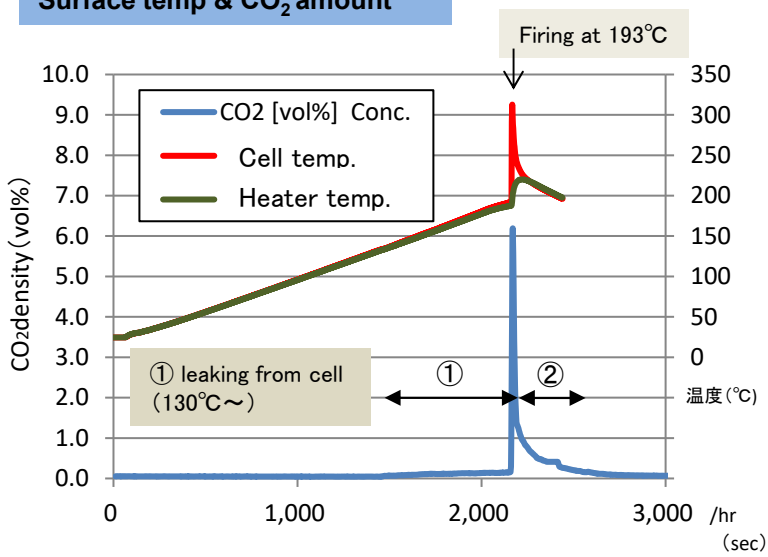
Case: Generated gas analysis of cylindrical battery in heating test

＜Details of battery＞
Contents : NCM cathode, Graphite anode, PE phase separator, electrolyte（Carnonate,$LiPF_6$))
Capacity : 2900 mAh

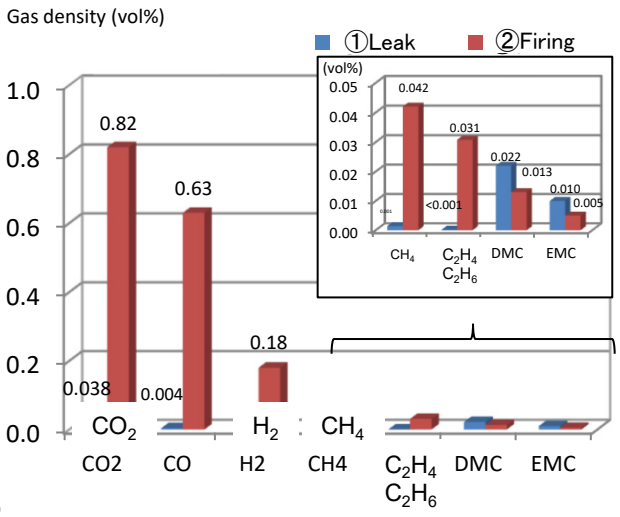
＜Testing conditions＞
Heating methods: Exclusive jig, Heating condition: RT→200℃(5℃/ min), Voltage before test (OCV) : 4.2V

＜Test results＞

Surface temp & CO_2 amount



Gas quantity



Real time gas analysis is available with thermal behavior using portable gas analyzer.
Compositional analysis and generated gas amount is also available by GC/MS