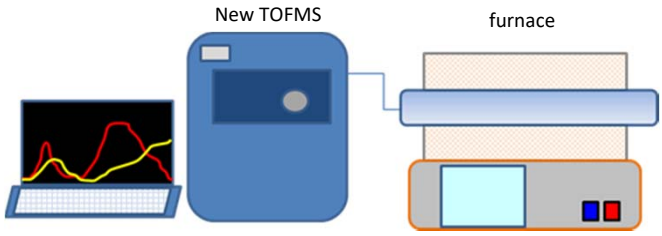
Online Accurate mass measurements of evolved gas ～TPD-TOFMS analysis～

Toray Research Center, Inc. established the TPD-TOFMS* apparatus, which consists of a temperature-controlled furnace with a time of flight high-resolution mass spectrometer. TPD-TOFMS is applied to determine evolved gas species. Based on the advantage of TOFMS, it is possible to distinguish components of same integer mass number (e.g. CO or N_2, SO_2 or S_2).

* Temperature Programmed Desorption-Time Of Flight Mass Spectrometry

Equipment overview



Each evolved gas species can be detected as a function of heating time or temperature.

●Equipment specifications

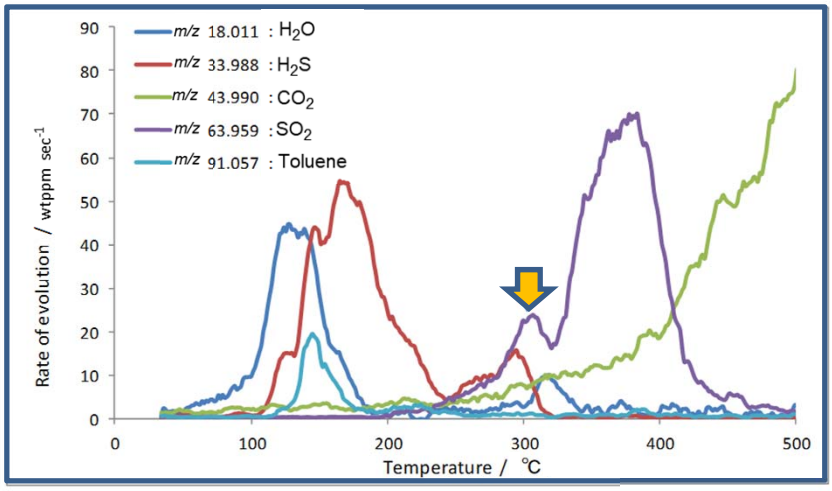
Temperature Range	:	R.T.～1000℃
Heating rate	:	1～50℃/min
Atmosphere	:	He, O_2/He etc.
Mass range	:	*m/z* 2-300
Mass accuracy	:	±0.001

※Depending on experimental Condition

Measurement of a material for sulfide all-solid-state batteries※

※Sample was provided by Dr. M.Tabuchi and Dr. T.Kojima in AIST, Japan.

Outgas safety assessment and degradation in heating process are investigated via evolved gas analysis.

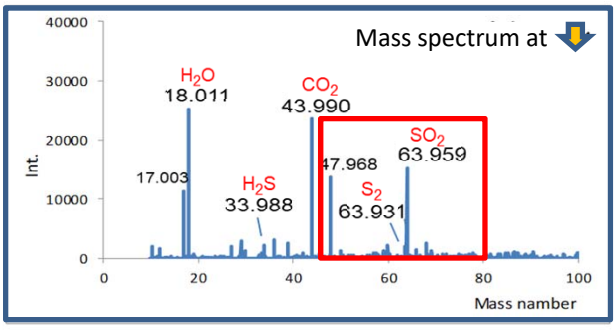


●**Experimental Condition**

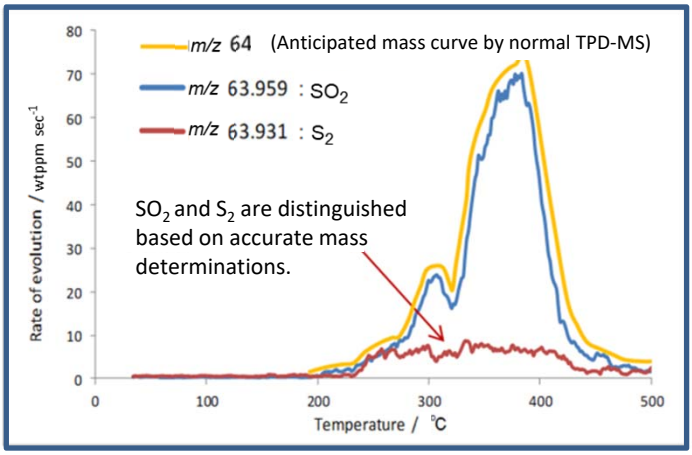
Temperature Range	: R.T.→500℃, 10℃/min
Atmosphere	: He
Mass range	: *m/z* 10-300

※The sample was transported to apparatus without exposure to air.

☜Monitorable evolved gas analysis as well as conventional TPD-MS. Moreover, it is possible to distinguish outgas components of same integer mass number via high resolution of mass detection.



☝By analyzing the mass spectral data, S_2 peak (Fragment ion of cyclic S_6, S_8) are identified near SO_2 peak.



☆Based on the TOFMS detector, we can separate SO_2 and S_2. The precise interpretation of thermal degradation (e.g. progress of oxidation and/or change in chemical structure) can be discussed by TPD-TOFMS analysis.

Toray Research Center, Inc.