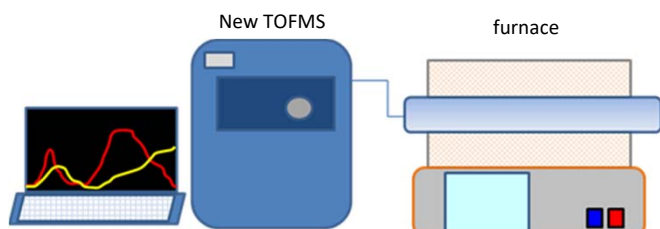


Online Accurate mass measurements of evolved gas ~TPD-TOFMS analysis~

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 N₂, SO₂ or S₂).

Equipment overview



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

* Temperature Programmed Desorption-Time Of Flight Mass Spectrometry

Equipment specifications

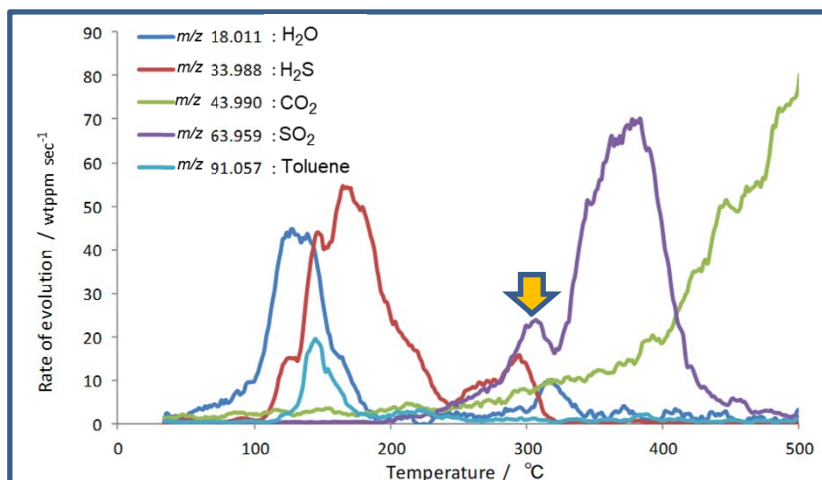
Temperature Range : R.T.~1000°C
 Heating rate : 1~50°C/min
 Atmosphere : He, O₂/He etc.
 Mass range : m/z 2-300
 Mass accuracy : ± 0.001

※ 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.

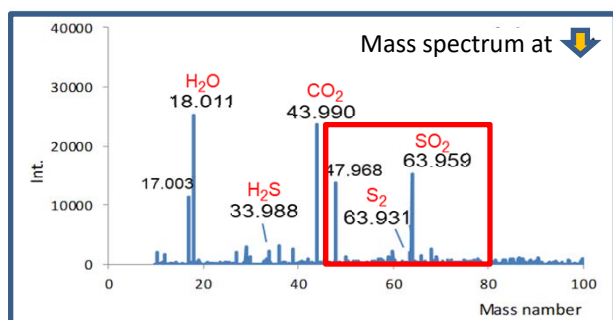
Outgas safety assessment and degradation in heating process are investigated via evolved gas analysis.



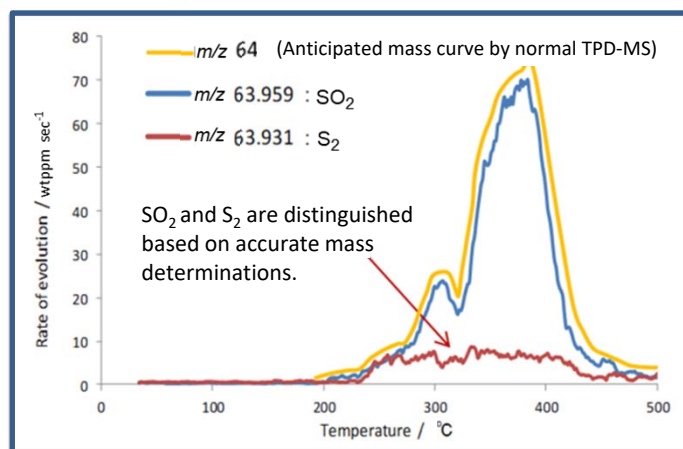
Experimental Condition

Temperature Range : R.T.→500°C, 10°C/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, S₂ peak (Fragment ion of cyclic S₆, S₈) are identified near SO₂ peak.



☆ Based on the TOFMS detector, we can separate SO₂ and S₂. The precise interpretation of thermal degradation (e.g. progress of oxidation and/or change in chemical structure) can be discussed by TPD-TOFMS analysis.