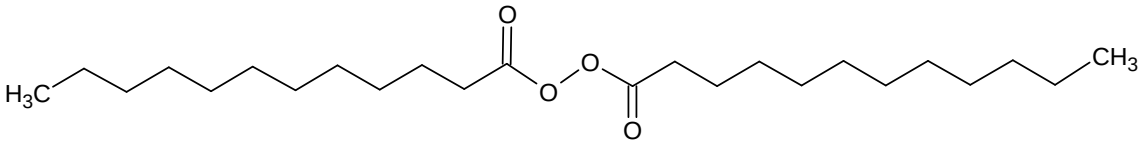
産業技術総合研究所　高エネルギー物質研究グループ
発熱分解エネルギー測定の標準化　　熱分析結果

Lauroyl peroxide　　$C_{24}H_{46}O_4$　　LPO

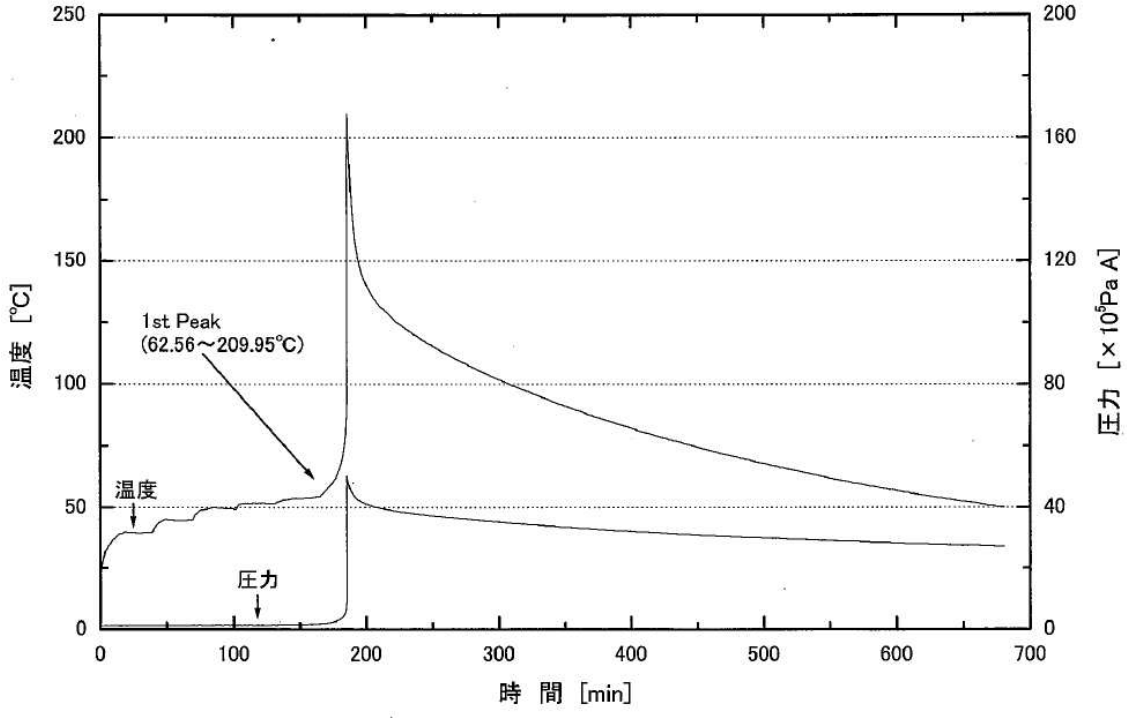


ARC device: ES-ARC (Thermal Hazard Technology)

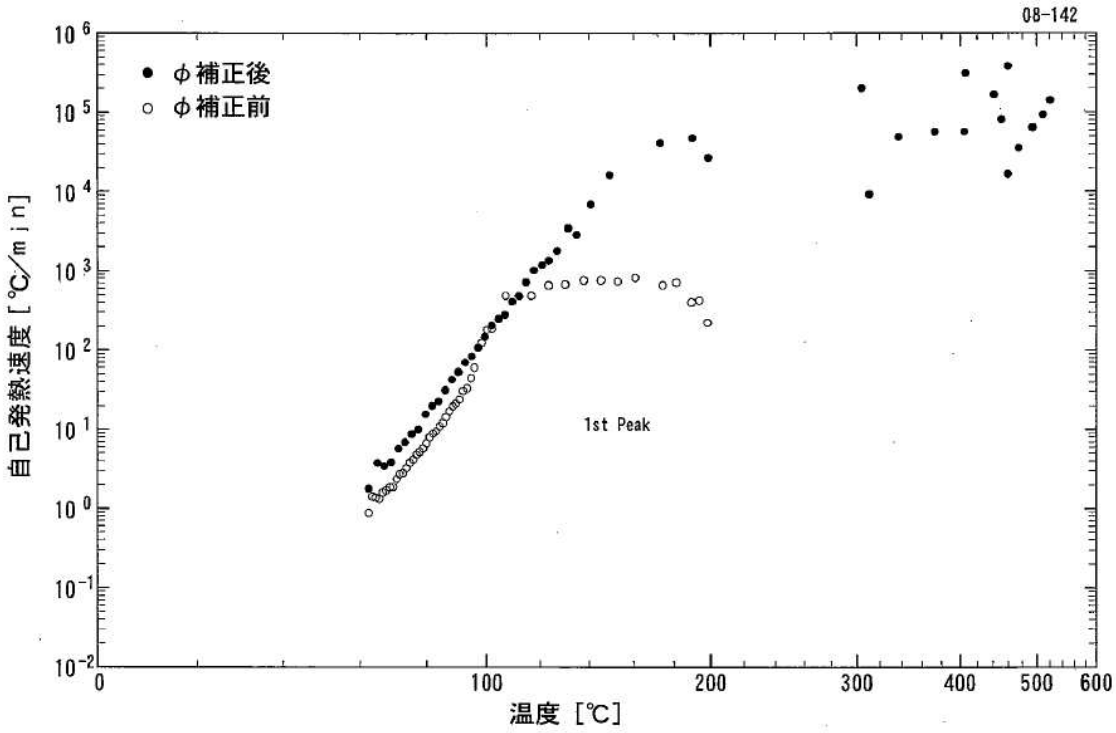
Date: 2008/12

Operator: SCAS

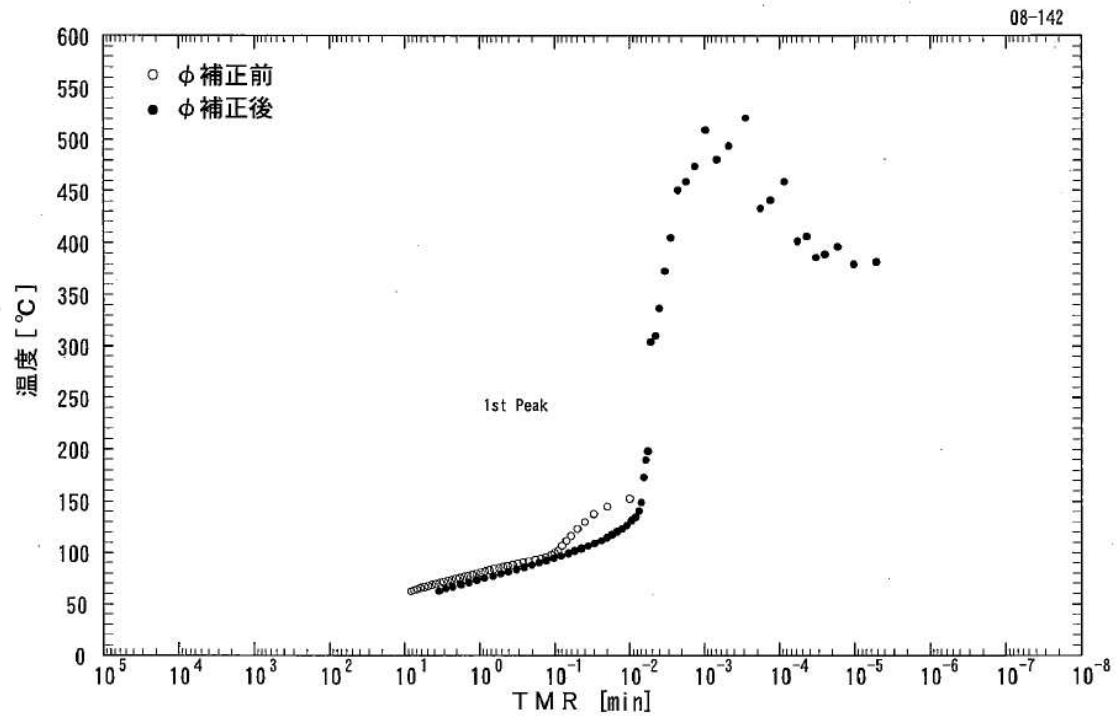
a) Weight of sample: 2.9854 g



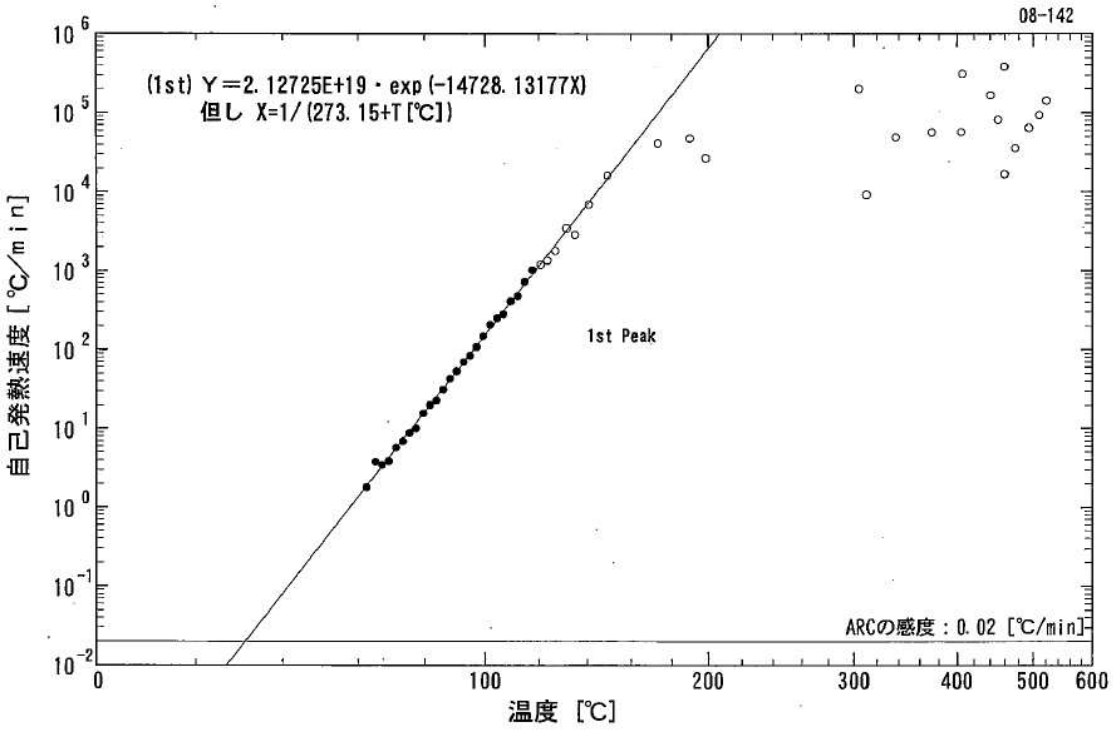
Time vs. Temperature and Pressure



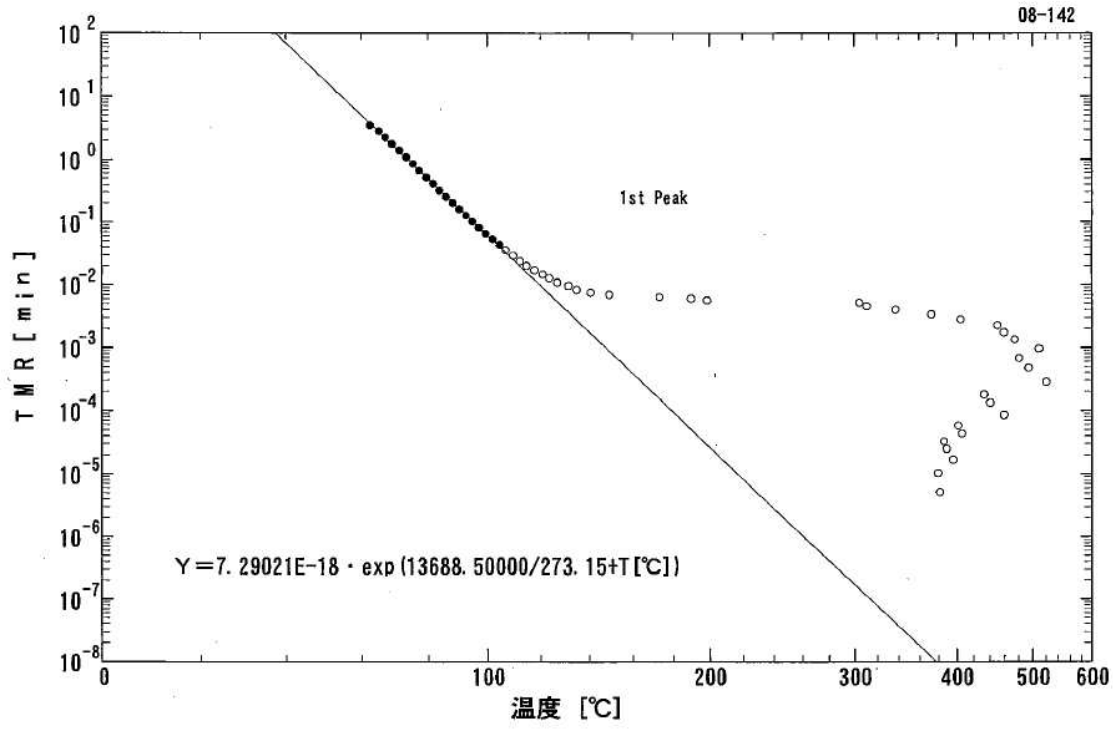
Temperature vs. Self heating rate



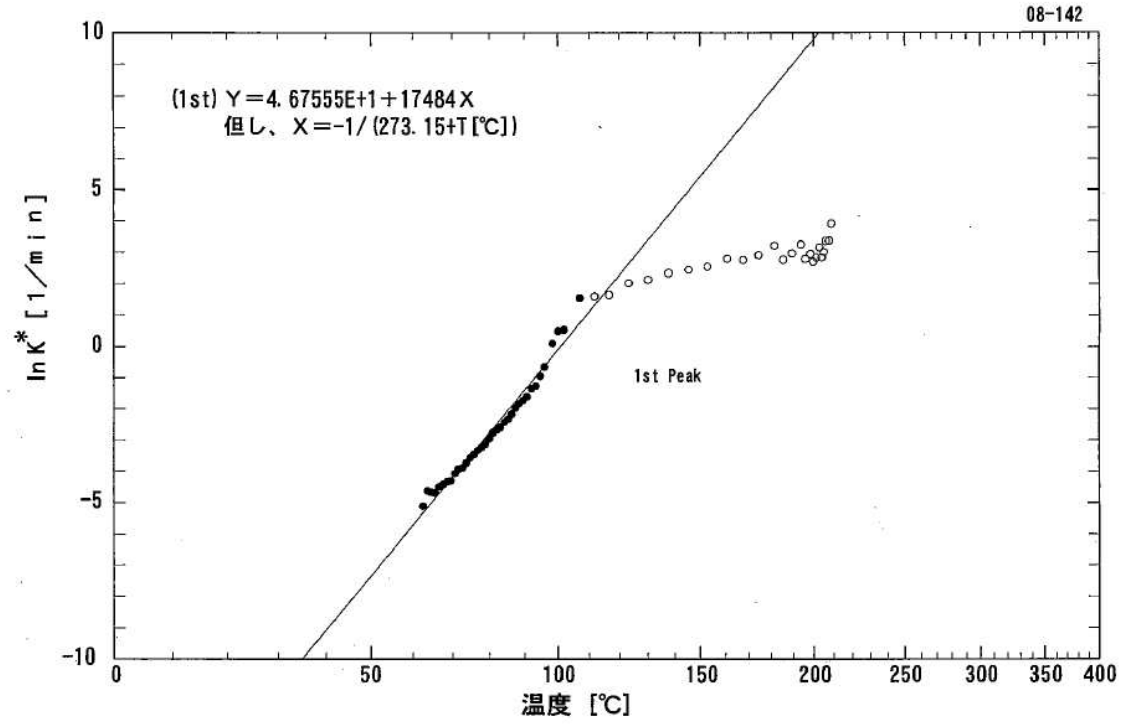
TMR vs. Temperature



Temperature vs. Self heating rate (approximate calculation)

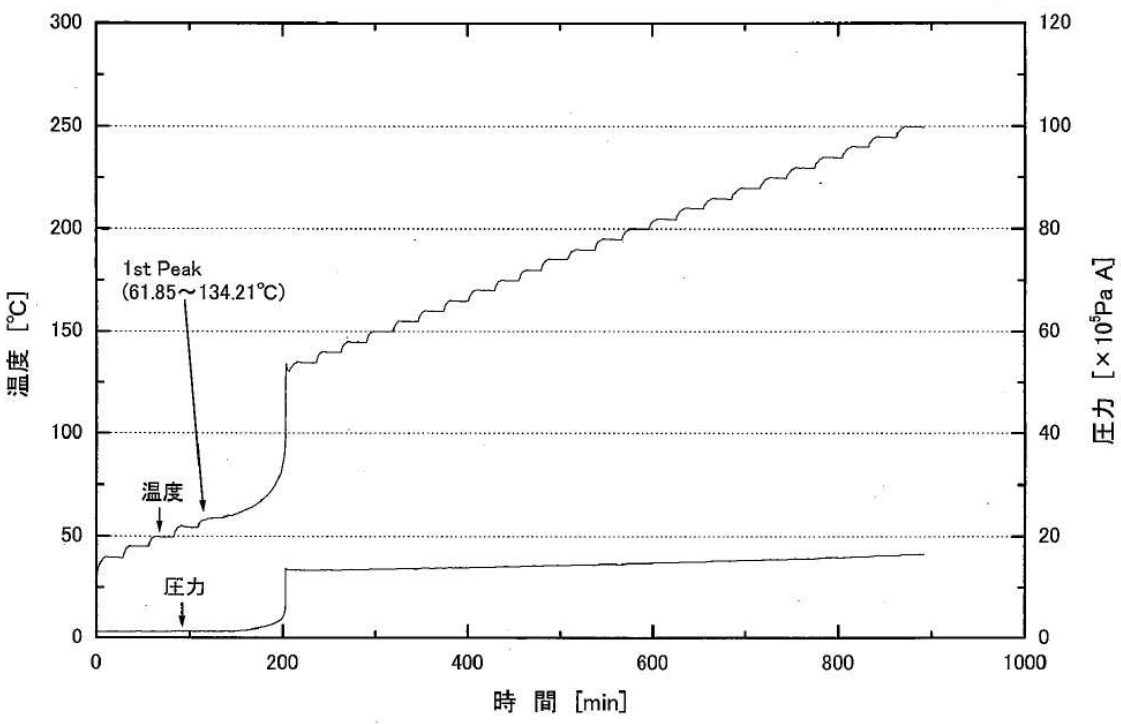


Temperature vs. TMR (approximate calculation)

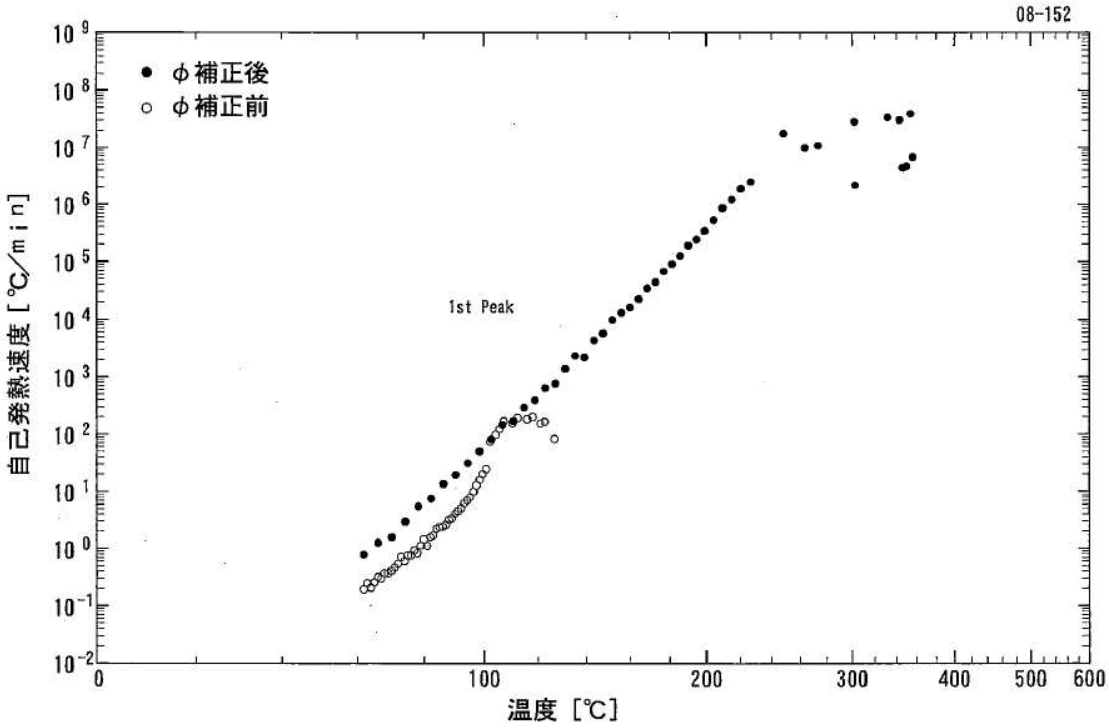


Arrhenius equation (approximate calculation)

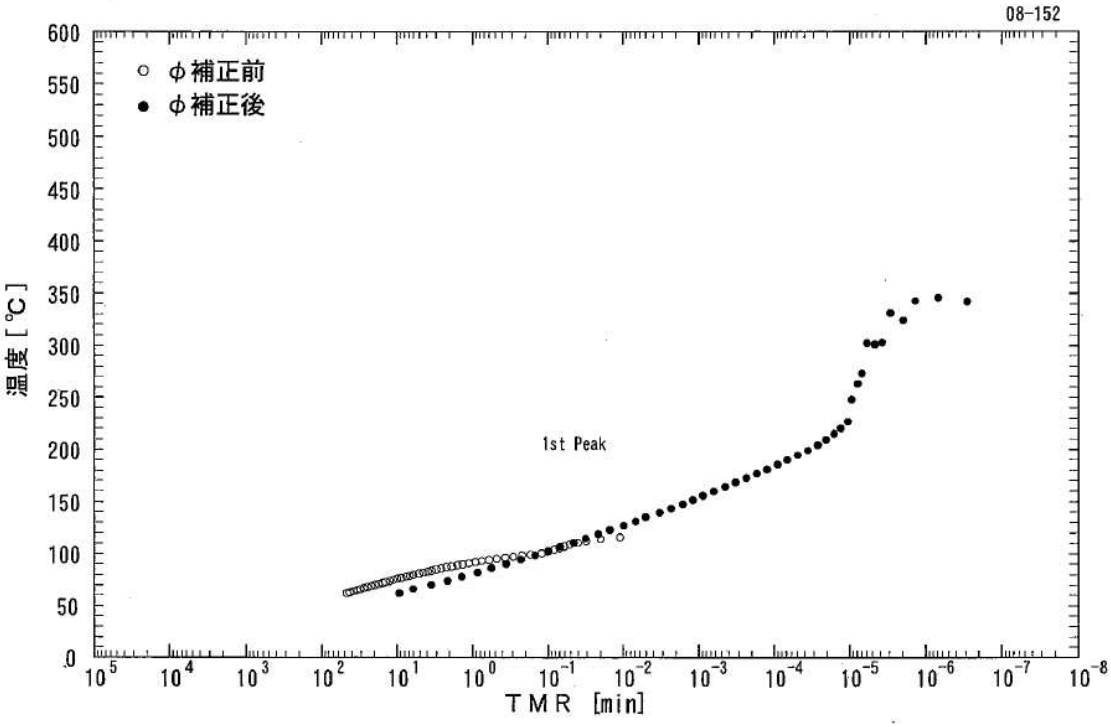
b) Weight of sample: 0.9997 g



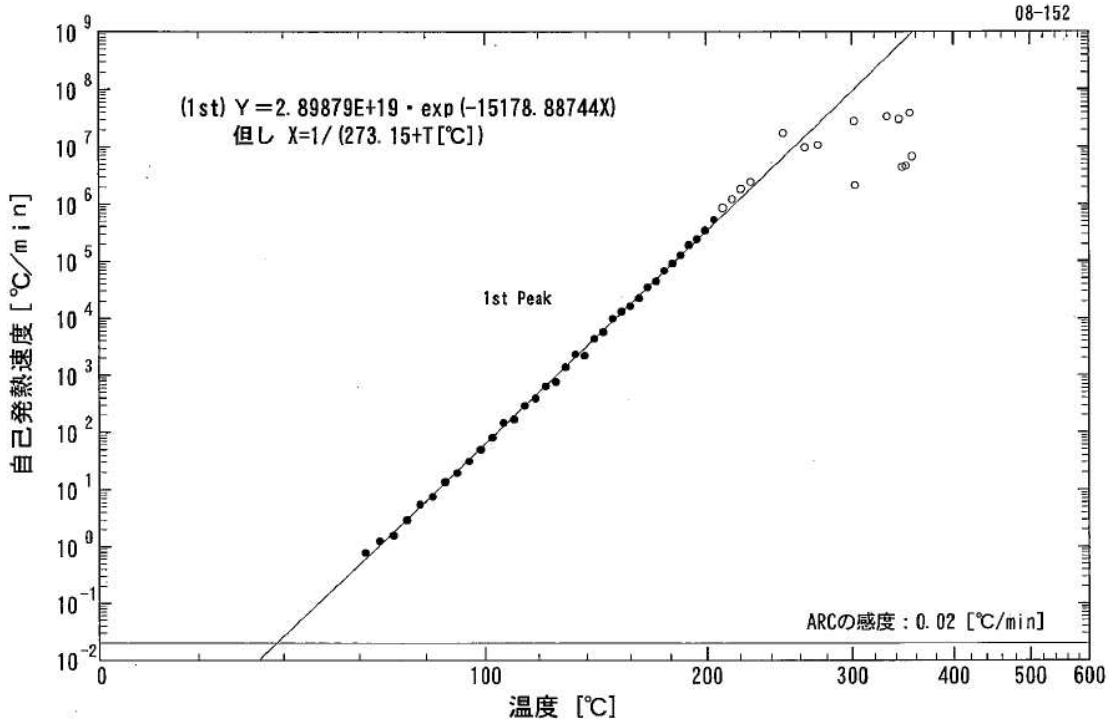
Time vs. Temperature and Pressure



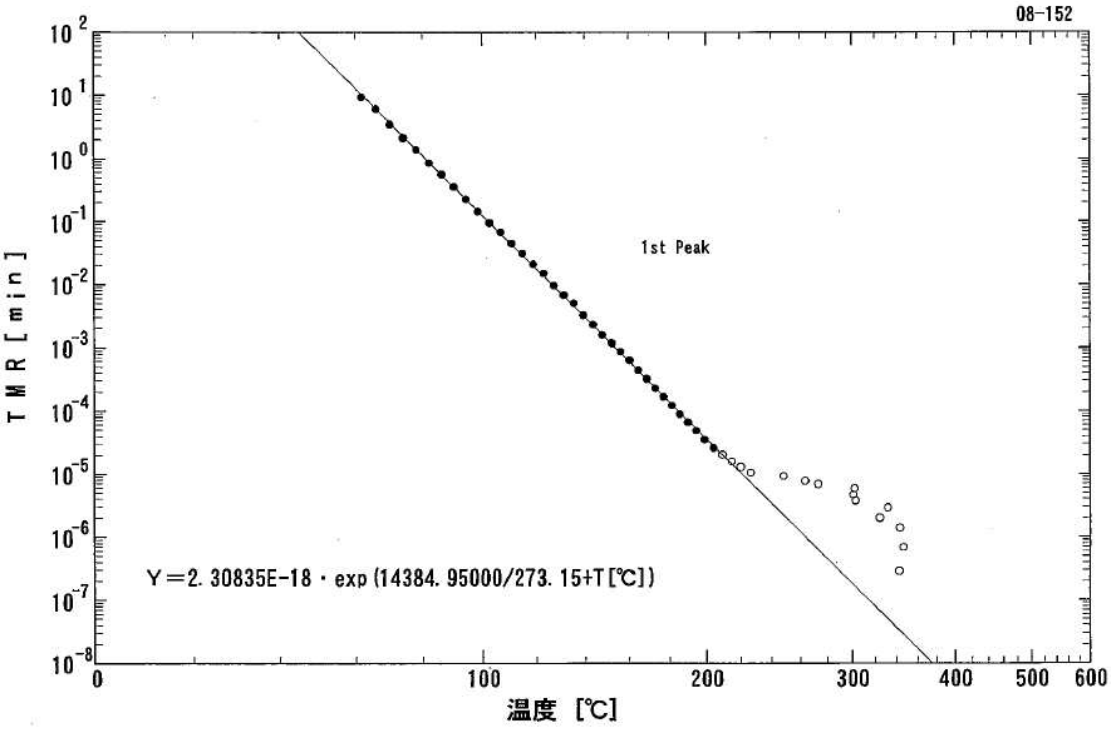
Temperature vs. Self heating rate



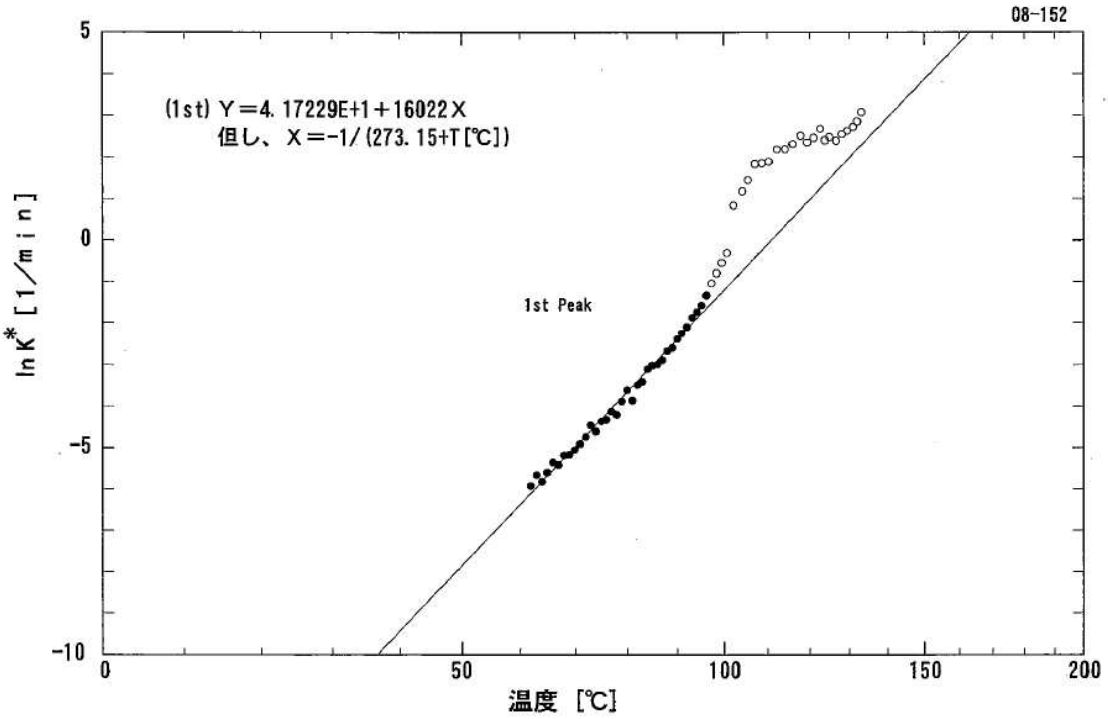
TMR vs. Temperature



Temperature vs. Self heating rate (approximate calculation)



Temperature vs. TMR (approximate calculation)



Arrhenius equation (approximate calculation)

a) Weight of sample: 2.9854 g

	Date	2008/12/9
Measuring conditions	ARC device	ES-ARC (Thermal Hazard Technology)
	Operating Institute	SCAS
	Operator	SCAS
	Material of Bomb	Hastelloy C
	Weight of Bomb (g)	15.186
	Volume of Bomb (mL)	about 9
	Weight of sample (g)	2.9854
	Weight of residue (g)	1.9333
	Specific heat of Bomb (J K^{-1} g^{-1})	0.419
	Specific heat of sample (J K^{-1} g^{-1})	2.093
	ϕ facotr	2.018
	Start temperature (℃)	40
	End temperature (℃)	209.95
	Temperature increment (K)	5
	Waiting time (min)	―

	Searching time (min)	10
	Exothermic threshold (K min^{-1})	0.02
	Logging intervals (℃)	1.0
	Pressure limit (kPa)	20000
	Atmosphere	Air, atmospheric pressure
Results	T_o, Exothermic temperature (℃)	62.56
	Self heating rate at T_o (K min^{-1})	0.887
	Pressure at T_o (kPa)	264.2
	Temperature at maximum self heating rate (℃)	160.80
	Maximum self heating rate (K min^{-1})	718.42
	Pressure at maximum self heating rate (kPa)	5019
	Pressure rising rate at maximum self heating rate (kPa min^{-1})	-180.08
	Maximum pressure (kPa)	4951
	Maximum pressure rising rate (kPa min^{-1})	38279
	Temperature at maximum pressure rising rate (℃)	116.61
	Time to maximum rate (min)	8.31
	Maximum temperature (℃)	209.95
	Adiabatic temperature rise (℃)	147.39
	Activation energy (kJ mol^{-1})	145.5
	Heat of decomposition (J g^{-1})	622.6
Corrected results	T_{ARC}, Exothermic temperature (℃)	31.2
	Time of maximum rate at T_{ARC} (min)	254
	Self heating rate at T_{ARC} (K min^{-1})	0.02
	Maximum self heating rate (K min^{-1})	9.11×10^5
	Maximum temperature (℃)	372.2
	Adiabatic temperature rise (℃)	341.0
	Heat of decomposition (J g^{-1})	713.8

b) Weight of sample: 0.9997 g

	Date	2008/12/24
Measuring	ARC device	ES-ARC (Thermal Hazard Technology)

conditions	Operating Institute	SCAS
	Operator	SCAS
	Material of Bomb	Hastelloy C
	Weight of Bomb (g)	15.2103
	Volume of Bomb (mL)	about 9
	Weight of sample (g)	0.9997
	Weight of residue (g)	0.8437
	Specific heat of Bomb (J K^{-1} g^{-1})	0.419
	Specific heat of sample (J K^{-1} g^{-1})	2.093
	ϕ facotr	4.046
	Start temperature (℃)	40
	End temperature (℃)	249.46
	Temperature increment (K)	5
	Waiting time (min)	—
	Searching time (min)	10
	Exothermic threshold (K min^{-1})	0.02
	Logging intervals (℃)	1.0
	Pressure limit (kPa)	20000
	Atmosphere	Air, atmospheric pressure
Results	T_o, Exothermic temperature (℃)	61.85
	Self heating rate at T_o (K min^{-1})	0.194
	Pressure at T_o (kPa)	149.7
	Temperature at maximum self heating rate (℃)	117.96
	Maximum self heating rate (K min^{-1})	201.09
	Pressure at maximum self heating rate (kPa)	1340
	Pressure rising rate at maximum self heating rate (kPa min^{-1})	1427.1
	Maximum pressure (kPa)	1369
	Maximum pressure rising rate (kPa min^{-1})	5698.6
	Temperature at maximum pressure rising rate (℃)	107.13
	Time to maximum rate (min)	46.55
	Maximum temperature (℃)	134.21

	Adiabatic temperature rise (℃)	72.36
	Activation energy (kJ mol^{-1})	133.3
	Heat of decomposition (J g^{-1})	612.8
Corrected results	T_{ARC}, Exothermic temperature (℃)	38.5
	Time of maximum rate at T_{ARC} (min)	262
	Self heating rate at T_{ARC} (K min^{-1})	0.02
	Maximum self heating rate (K min^{-1})	3.94×10^{7}
	Maximum temperature (℃)	356.6
	Adiabatic temperature rise (℃)	318.1
	Heat of decomposition (J g^{-1})	665.9