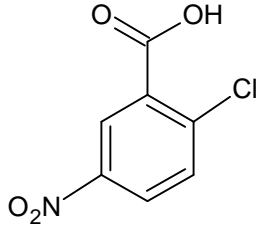


2-Chloro-5-nitrobenzoic acid

$(\text{NO}_2)\text{ClC}_6\text{H}_3\text{COOH}$

CNBA

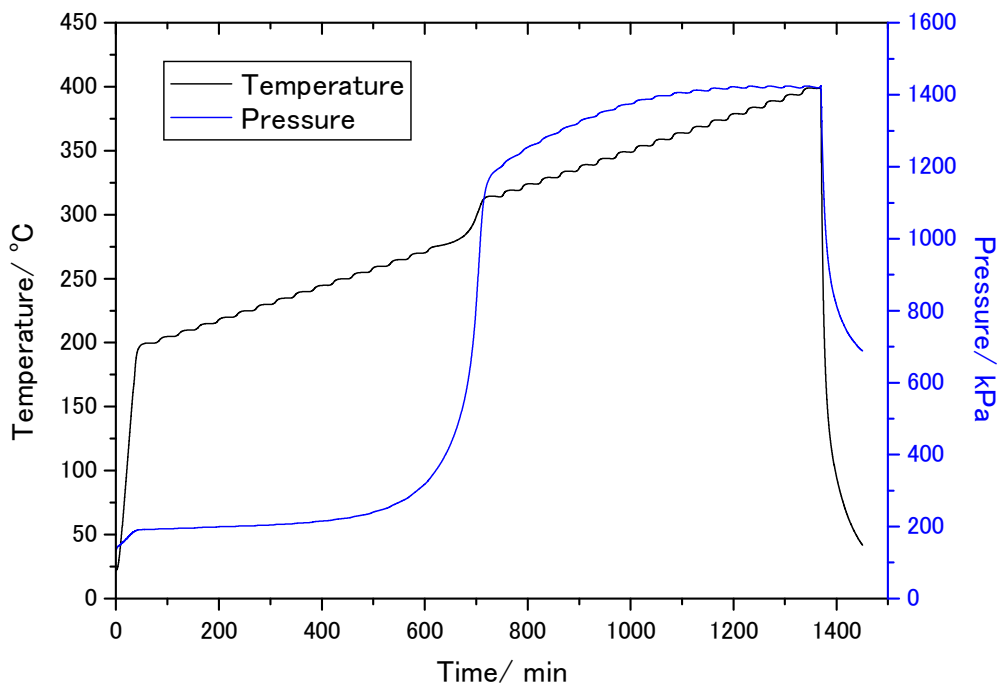


ARC device: New ARC (TIAX, LLC)

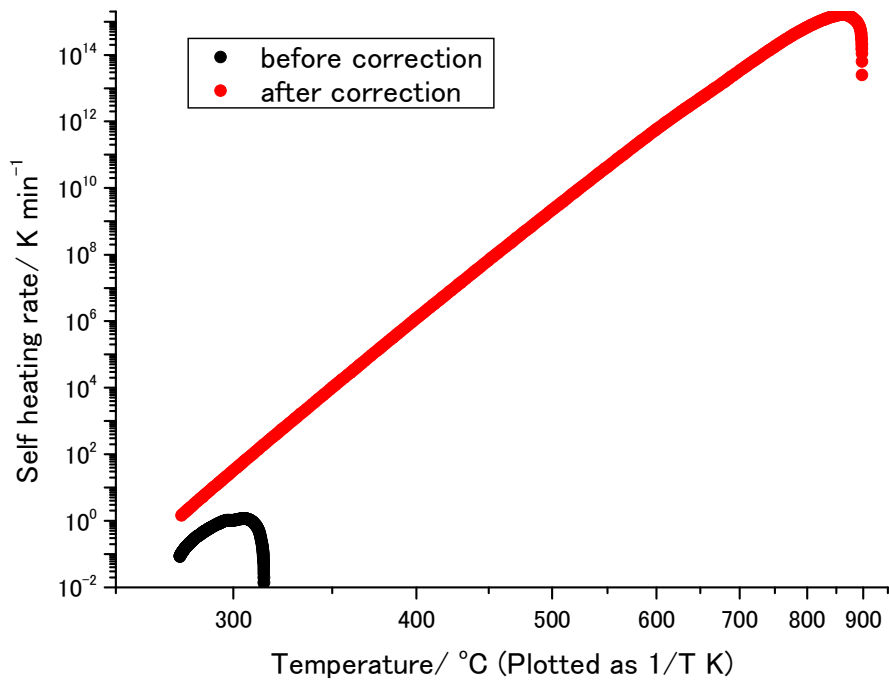
Date: 2010/1, 2

Operator: Y. S.

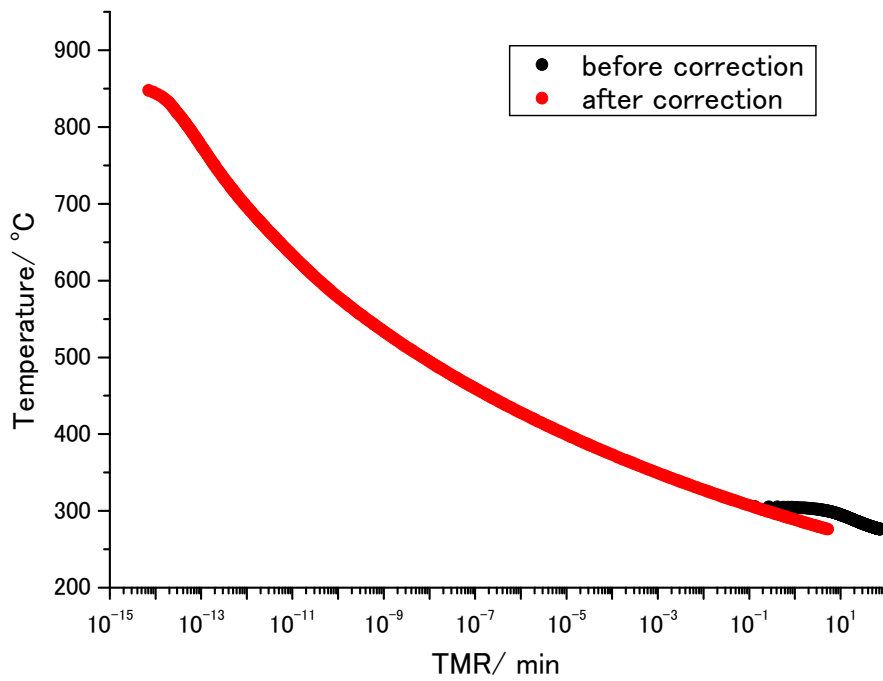
a) Weight: 0.268 g



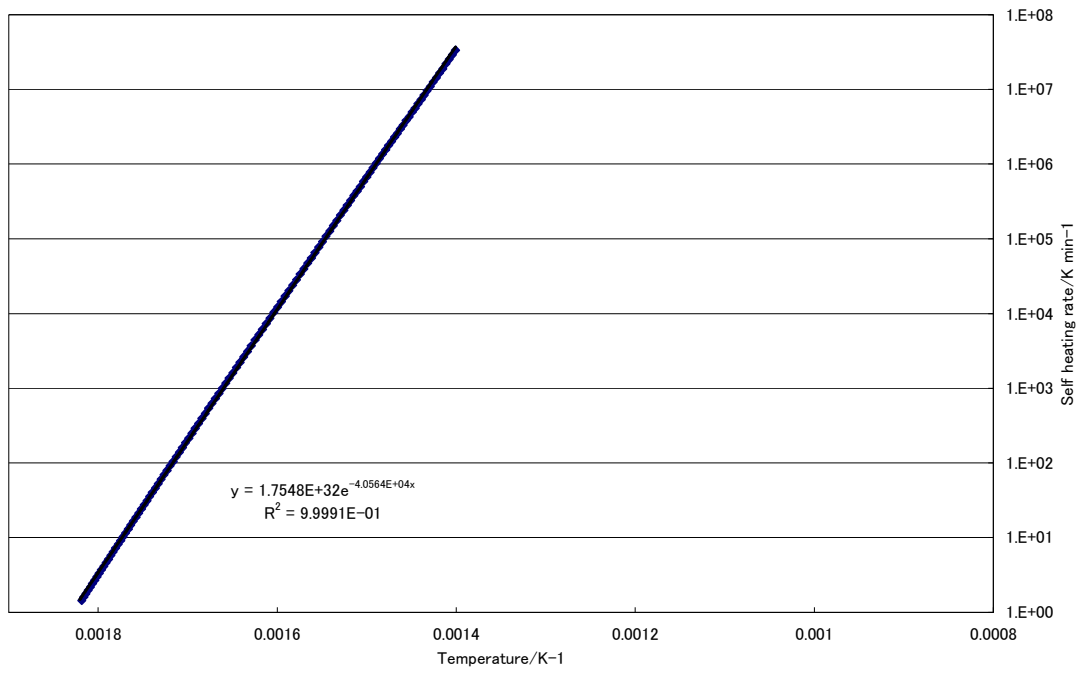
Time vs. Temperature and Pressure



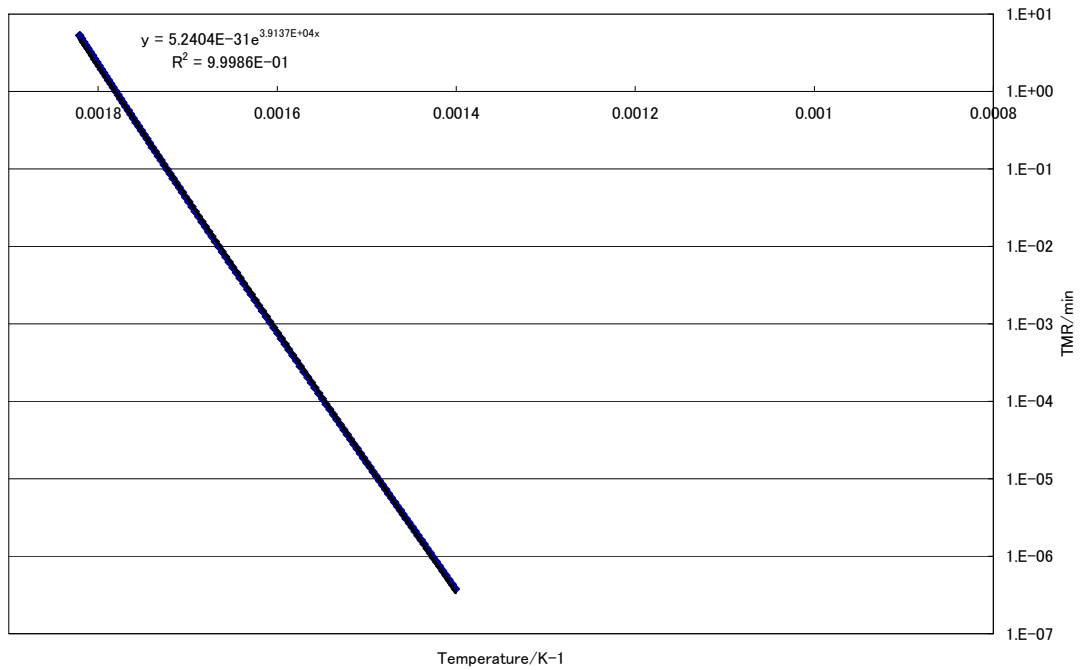
Temperature vs. Self heating rate



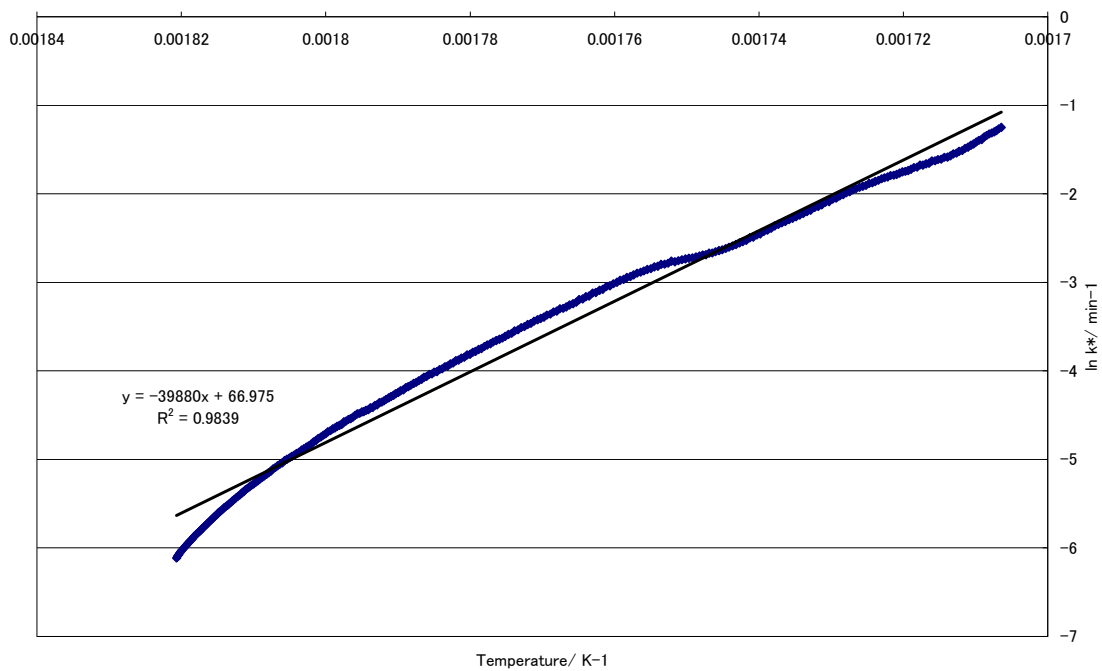
TMR vs. Temperature



Temperature vs. Self heating rate (approximate calculation)

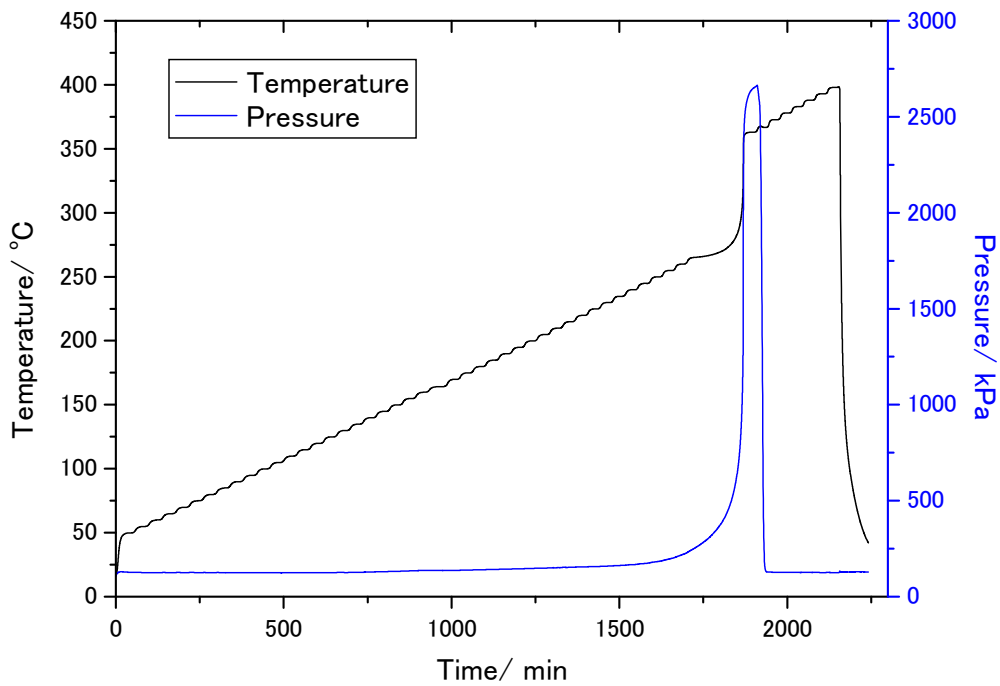


Temperature vs. TMR (approximate calculation)

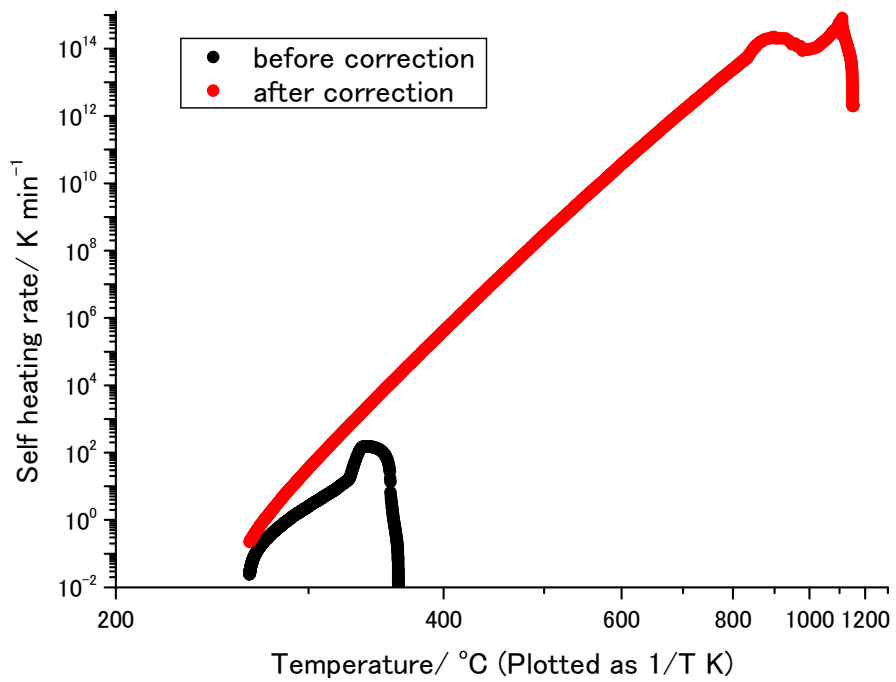


Arrhenius equation (approximate calculation)

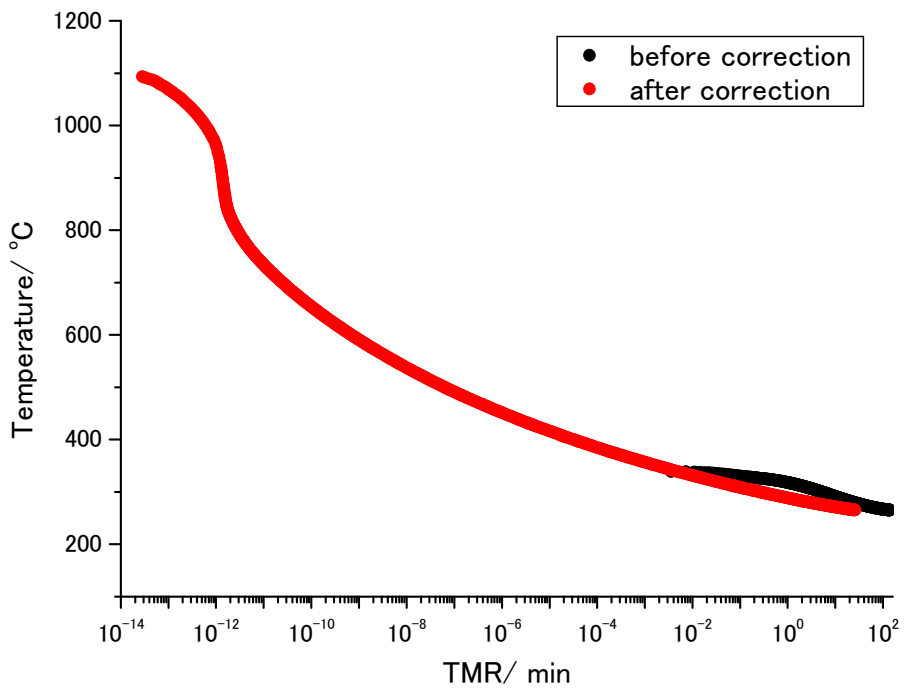
b) Weight: 0.499 g



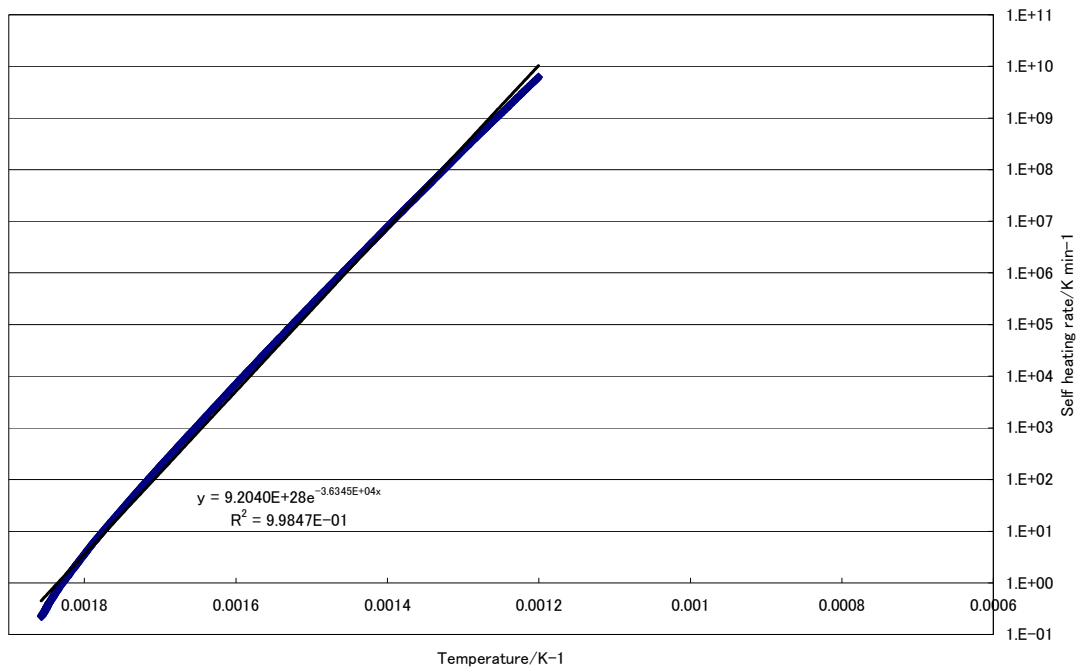
Time vs. Temperature and Pressure



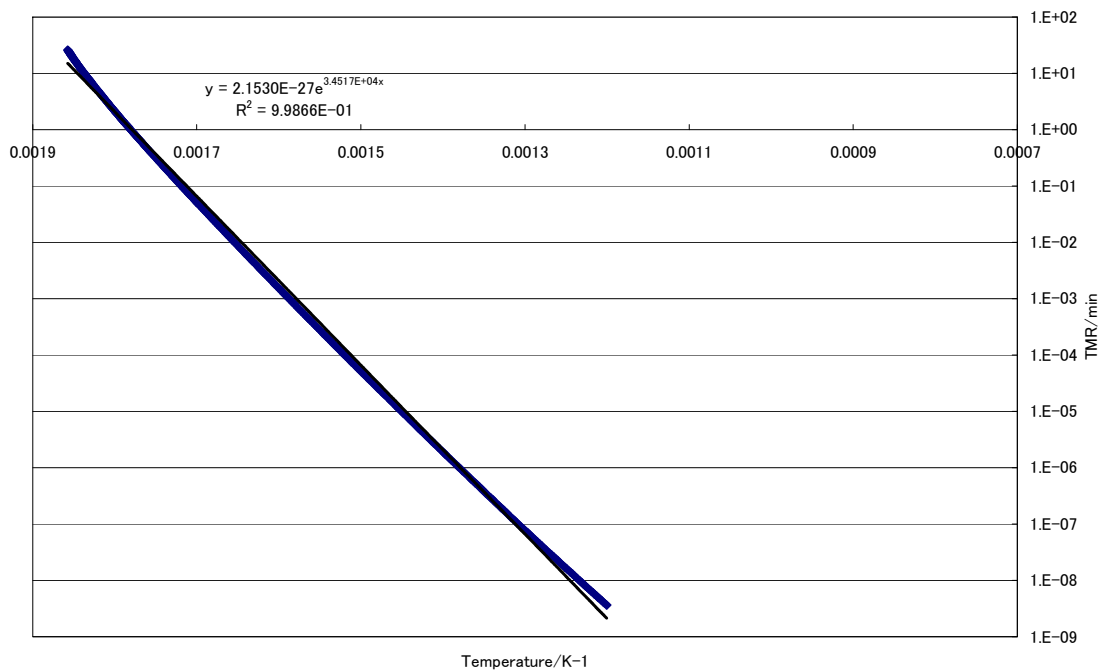
Temperature vs. Self heating rate



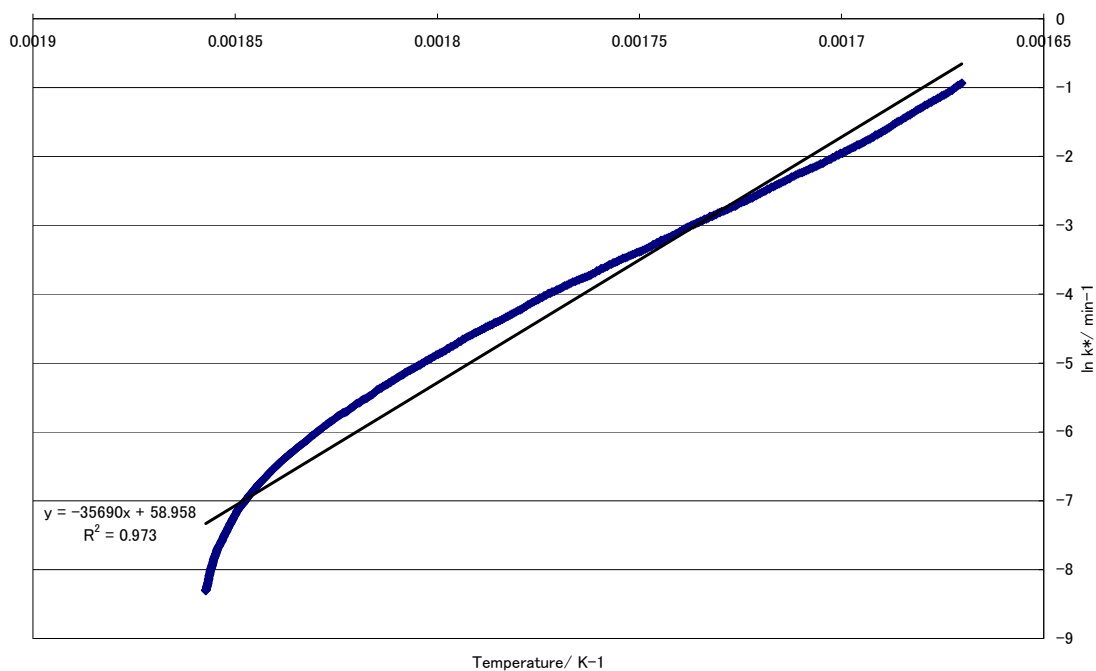
TMR vs. Temperature



Temperature vs. Self heating rate (approximate calculation)



Temperature vs. TMR (approximate calculation)



Arrhenius equation (approximate calculation)

a) Weight: 0.268 g

	Date	2010/2/10
Measuring conditions	ARC device	NewARC (TIAX, LLC)
	Operating Institute	AIST
	Operator	Y. S.
	Material of Bomb	Hastelloy C
	Weight of Bomb (g)	20.3615
	Volume of Bomb (mL)	about 9
	Weight of sample (g)	0.2678
	Weight of residue (g)	—
	Specific heat of Bomb (J K <sup>-1</sup> g <sup>-1</sup> )	0.419
	Specific heat of sample (J K <sup>-1</sup> g <sup>-1</sup> )	2.093
	φ facotr	16.22
	Start temperature (°C)	200
	End temperature (°C)	400
	Temperature increment (K)	5
	Waiting time (min)	15
	Searching time (min)	15
Exothermic threshold (K min <sup>-1</sup> )	0.02	

	Logging intervals (°C)	0.15
	Pressure limit (kPa)	20000
	Atmosphere	Air, atmospheric pressure
Results	T <sub>o</sub> , Exothermic temperature (°C)	276.10
	Self heating rate at T <sub>o</sub> (K min <sup>-1</sup> )	0.084
	Pressure at T <sub>o</sub> (kPa)	380.27
	Temperature at maximum self heating rate (°C)	305.59
	Maximum self heating rate (K min <sup>-1</sup> )	1.1627
	Pressure at maximum self heating rate (kPa)	966.09
	Pressure rising rate at maximum self heating rate (kPa min <sup>-1</sup> )	23.723
	Maximum pressure (kPa)	1193.9
	Maximum pressure rising rate (kPa min <sup>-1</sup> )	24.188
	Temperature at maximum pressure rising rate (°C)	304.11
	Time to maximum rate (min)	73.885
	Maximum temperature (°C)	314.57
	Adiabatic temperature rise (°C)	38.47
	Activation energy (kJ mol <sup>-1</sup> )	331.6
	Heat of decomposition (J g <sup>-1</sup> )	1306
Corrected results	T <sub>ARC</sub> , Exothermic temperature (°C)	245.86
	Time of maximum rate at T <sub>ARC</sub> (min)	294.54
	Self heating rate at T <sub>ARC</sub> (K min <sup>-1</sup> )	0.02
	Maximum self heating rate (K min <sup>-1</sup> )	$1.6387 \times 10^{15}$
	Maximum temperature (°C)	897.82
	Adiabatic temperature rise (°C)	651.96
	Heat of decomposition (J g <sup>-1</sup> )	1365

b) Weight: 0.499 g

	Date	2010/1/25
Measuring conditions	ARC device	NewARC (TIAX, LLC)
	Operating Institute	AIST
	Operator	Y. S.



	Material of Bomb	Hastelloy C
	Weight of Bomb (g)	20.1825
	Volume of Bomb (mL)	about 9
	Weight of sample (g)	0.4993
	Weight of residue (g)	—
	Specific heat of Bomb ( $\text{J K}^{-1} \text{g}^{-1}$ )	0.419
	Specific heat of sample ( $\text{J K}^{-1} \text{g}^{-1}$ )	2.093
	$\phi$ facotr	9.092
	Start temperature ( $^{\circ}\text{C}$ )	50
	End temperature ( $^{\circ}\text{C}$ )	400
	Temperature increment (K)	5
	Waiting time (min)	15
	Searching time (min)	15
	Exothermic threshold ( $\text{K min}^{-1}$ )	0.02
	Logging intervals ( $^{\circ}\text{C}$ )	0.15
	Pressure limit (kPa)	20000
	Atmosphere	Air, atmospheric pressure
Results	$T_o$ , Exothermic temperature ( $^{\circ}\text{C}$ )	265.27
	Self heating rate at $T_o$ ( $\text{K min}^{-1}$ )	0.024
	Pressure at $T_o$ (kPa)	258.14
	Temperature at maximum self heating rate ( $^{\circ}\text{C}$ )	339.69
	Maximum self heating rate ( $\text{K min}^{-1}$ )	154.30
	Pressure at maximum self heating rate (kPa)	2043.4
	Pressure rising rate at maximum self heating rate ( $\text{kPa min}^{-1}$ )	3713.5
	Maximum pressure (kPa)	2652.7
	Maximum pressure rising rate ( $\text{kPa min}^{-1}$ )	4888.5
	Temperature at maximum pressure rising rate ( $^{\circ}\text{C}$ )	334.05
	Time to maximum rate (min)	139.82
	Maximum temperature ( $^{\circ}\text{C}$ )	363.03
	Adiabatic temperature rise ( $^{\circ}\text{C}$ )	97.76
	Activation energy ( $\text{kJ mol}^{-1}$ )	296.7

	Heat of decomposition ( $\text{J g}^{-1}$ )	1860
Corrected results	$T_{\text{ARC}}$ , Exothermic temperature ( $^{\circ}\text{C}$ )	241.62
	Time of maximum rate at $T_{\text{ARC}}$ (min)	284.23
	Self heating rate at $T_{\text{ARC}}$ ( $\text{K min}^{-1}$ )	0.02
	Maximum self heating rate ( $\text{K min}^{-1}$ )	$7.9633 \times 10^{14}$
	Maximum temperature ( $^{\circ}\text{C}$ )	1151.07
	Adiabatic temperature rise ( $^{\circ}\text{C}$ )	909.45
	Heat of decomposition ( $\text{J g}^{-1}$ )	1903