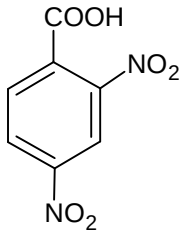
産業技術総合研究所　高エネルギー物質研究グループ
発熱分解エネルギー測定の標準化　　熱分析結果

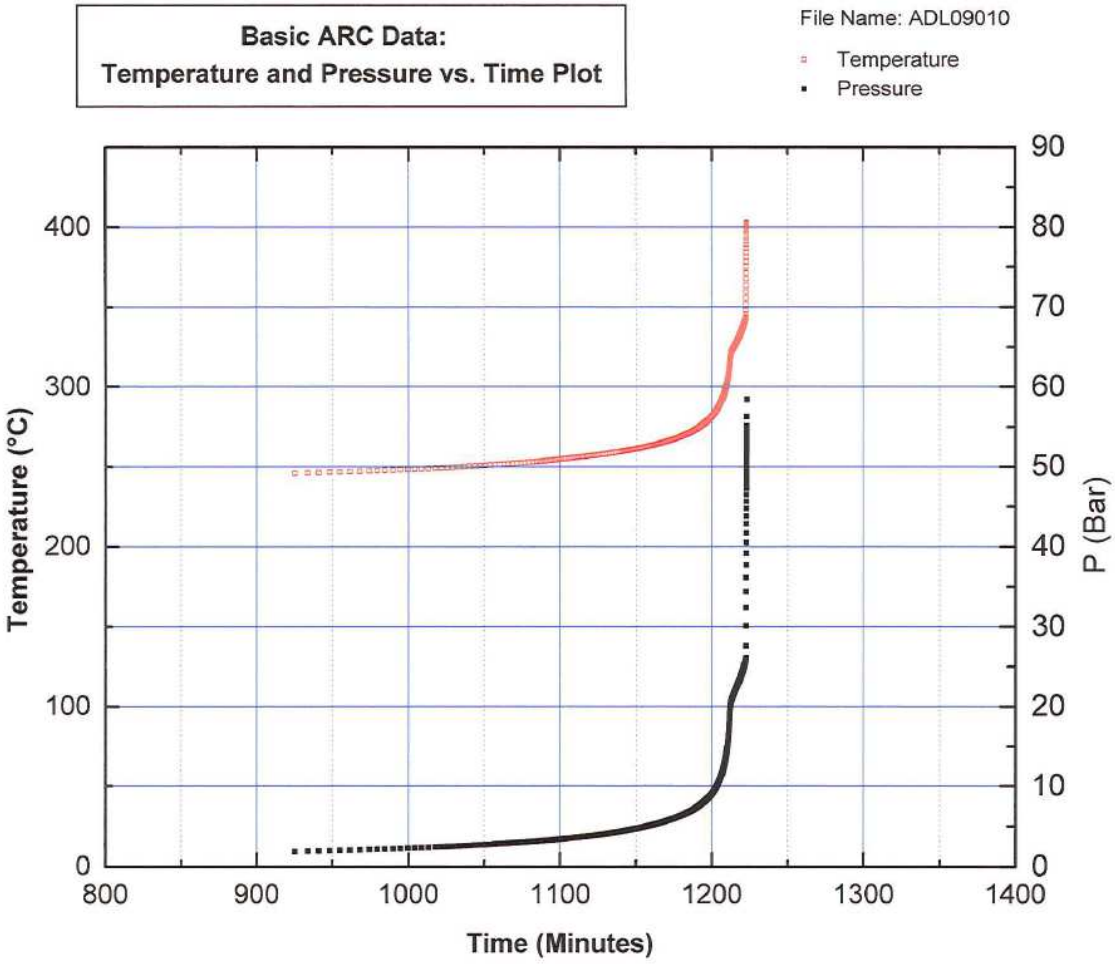
2,4-dinitrobenzoic acid　　$(O_2N)_2C_6H_3COOH$　　24DNBA



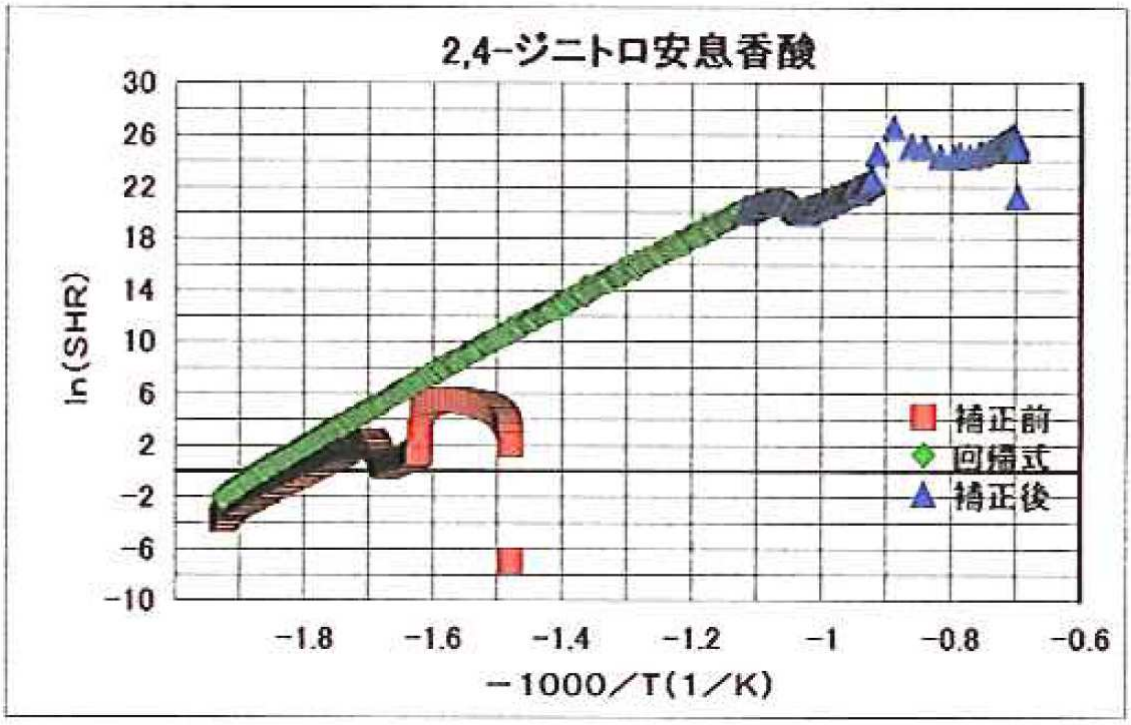
ARC device: ARC2000 (Arthur D. Little Inc.)

Date: 2009/1/14

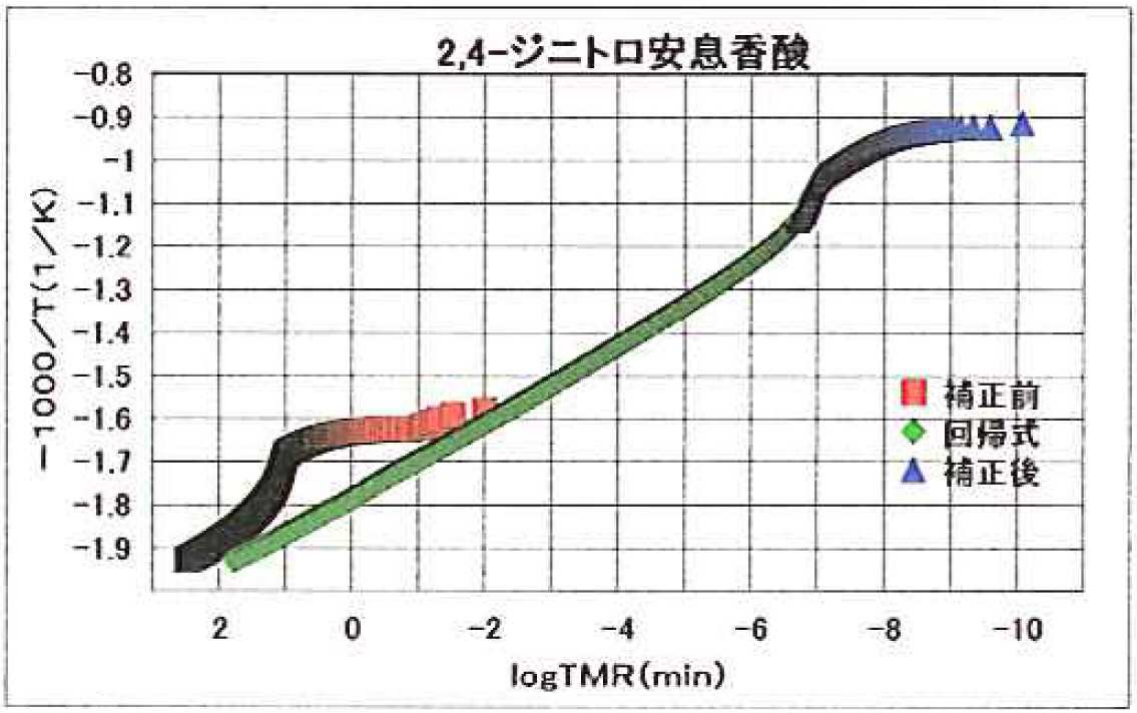
Operator: KJ



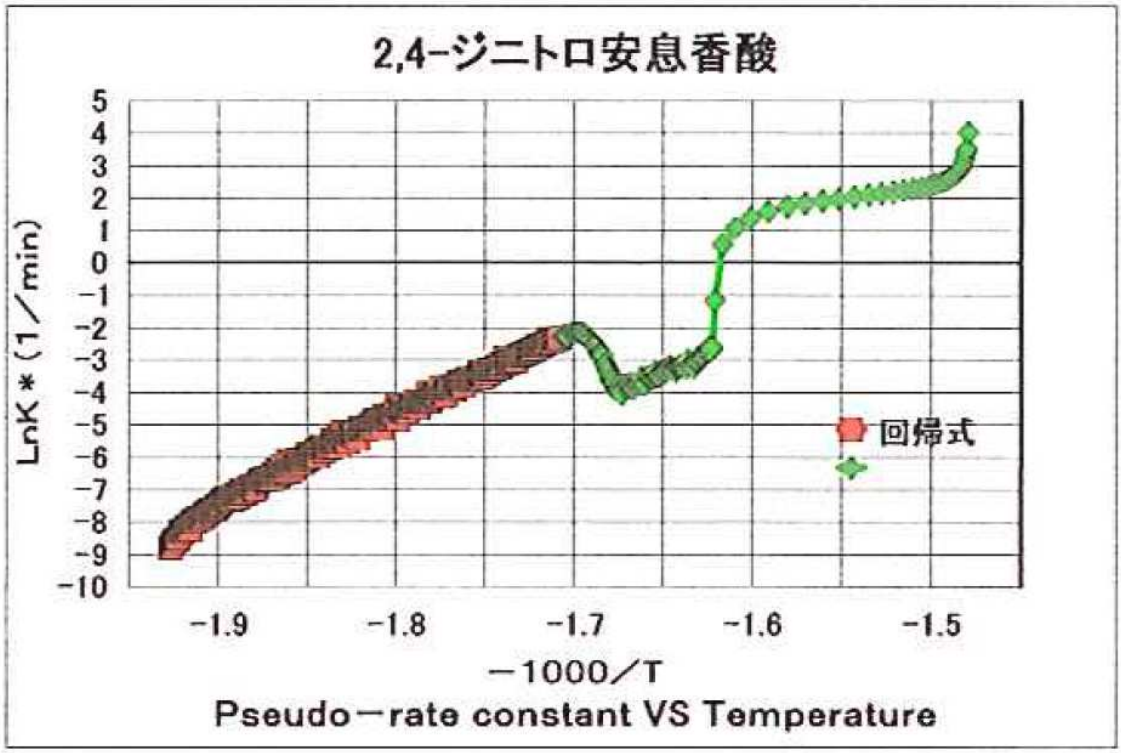
Time vs. Temperature and Pressure



Temperature vs. Self heating rate



TMR vs. Temperature



Arrhenius equation (approximate calculation)

	Date	2009/1/14
Measuring conditions	ARC device	ARC2000 (Arthur D. Little Inc.)
	Operating Institute	KJ
	Operator	KJ
	Material of Bomb	Hastelloy C
	Weight of Bomb (g)	15.110
	Volume of Bomb (mL)	about 9
	Weight of sample (g)	0.629
	Weight of residue (g)	0.166
	Specific heat of Bomb (J K^{-1} g^{-1})	0.419
	Specific heat of sample (J K^{-1} g^{-1})	2.093
	ϕ factor	5.80
	Start temperature (℃)	50
	End temperature (℃)	450
	Temperature increment (K)	5
	Waiting time (min)	10
	Searching time (min)	10

	Exothermic threshold (K min^{-1})	0.02
	Logging intervals (℃)	0.2
	Pressure limit (kPa)	17000
	Atmosphere	Air, atmospheric pressure
Results	T_o, Exothermic temperature (℃)	245.78
	Self heating rate at T_o (K min^{-1})	0.024
	Pressure at T_o (kPa)	190
	Temperature at maximum self heating rate (℃)	363.56
	Maximum self heating rate (K min^{-1})	248.15
	Pressure at maximum self heating rate (kPa)	3920
	Pressure rising rate at maximum self heating rate (kPa min^{-1})	8740
	Maximum pressure (kPa)	5840
	Maximum pressure rising rate (kPa min^{-1})	15048
	Temperature at maximum pressure rising rate (℃)	345.50
	Time to maximum rate (min)	297.20
	Maximum temperature (℃)	402.95
	Adiabatic temperature rise (℃)	157.17
	Activation energy (kJ mol^{-1})	230.3
	Heat of decomposition (J g^{-1})	1909
Corrected results	T_{ARC}, Exothermic temperature (℃)	222.05
	Time of maximum rate at T_{ARC} (min)	318.23
	Self heating rate at T_{ARC} (K min^{-1})	0.02
	Maximum self heating rate (K min^{-1})	3.75×10^{11}
	Maximum temperature (℃)	1160.3
	Adiabatic temperature rise (℃)	938.27
	Heat of decomposition (J g^{-1})	1964