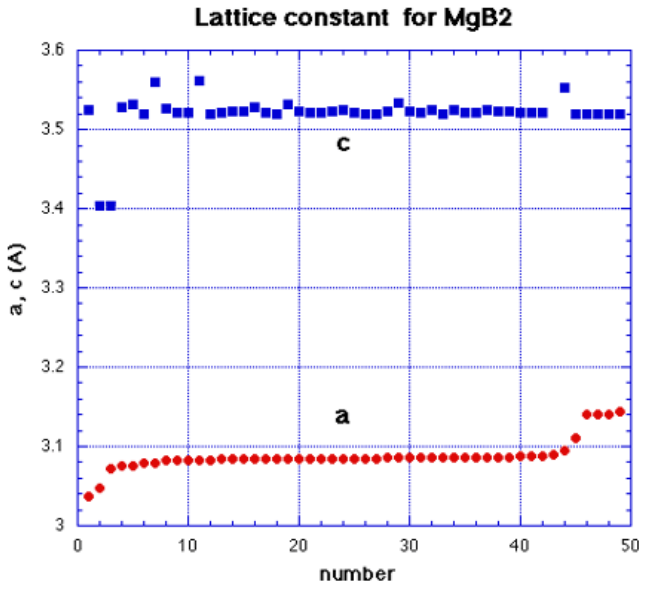
MgB2 の超伝導特性およびその関連特性

１．結晶構造

AlB2－type　hexagonal

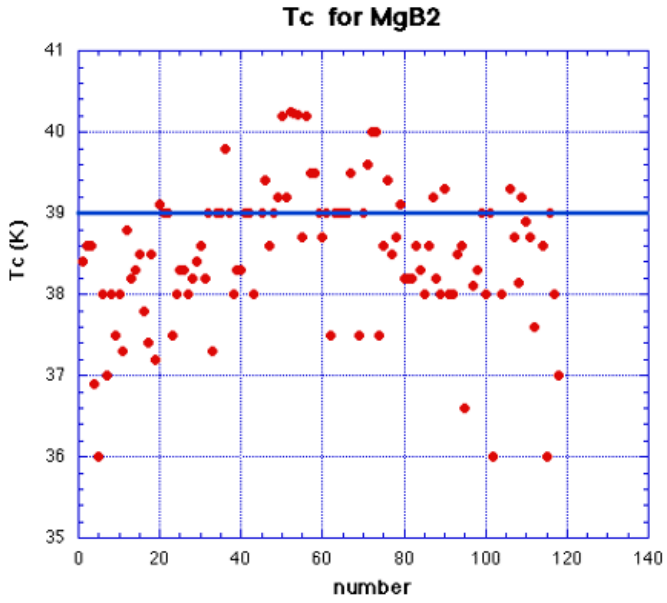
格子定数（横軸はデータを a の大きさで並べてある）。



２．Tc

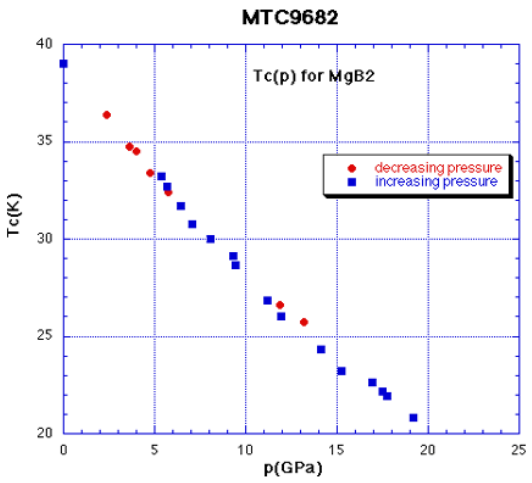
Tc ＝　39 K　（実線）

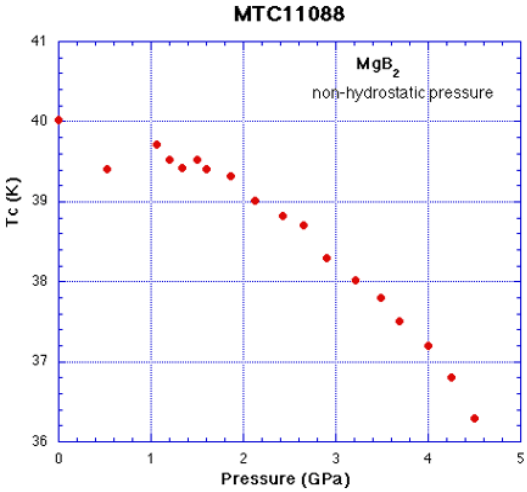
図はデータベースに収録されているすべての Tc を示す。



3．dTc/dP　　(K/GPa)

-1.07	MAT0104303	
-1.60	P064012507	
-0.35	MAT0106585	
-2.00	MAT0105475	
-1.11	P064092505	
-1.13	MAT0107205	
-1.03	P064132509	
-0.80	SCI2920075	
-1.11	PHC3610227	MTC9682
-1.18	PHC3660073	
-1.10	JP01403663	MTC11088





4．Isotope effect

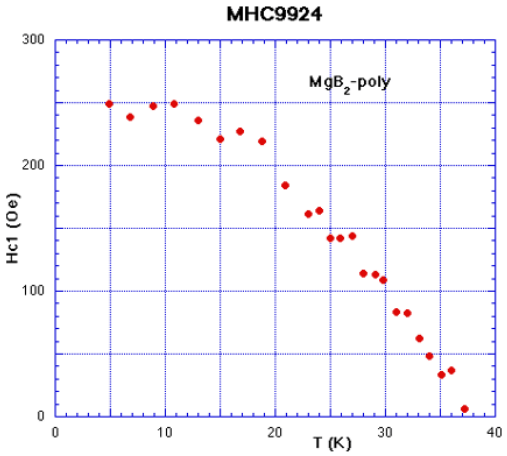
α <B> = 0.26 [PRL0861877]　0.3 [NAT4110457]

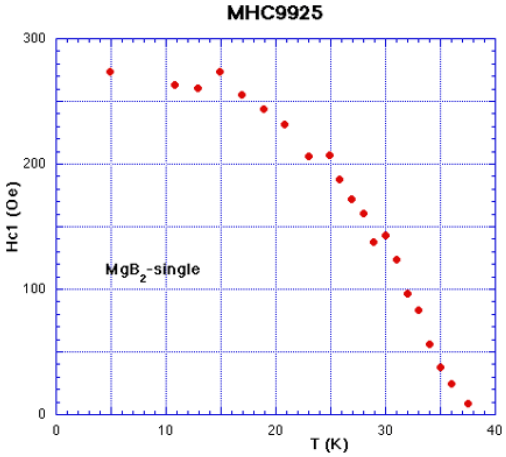
α <Mg> = 0.02 [NAT4110457]

α　=　α <B> +　α <Mg> = 0.32　[NAT4110457]

5. The lower critical field, Hc1(0) Oe

Hc1(poly)	Hc1//ab	Hc1//c		
	384	272	MAT0105271	
320			MAT0102167	
450			P063220508	
176			P064094522	
130			P064172501	
245			PHC3700006	MHC9924
280			PHC3700006	MHC9925
	656		P065180505	
2000			P065184516	
120			SSC1210575	

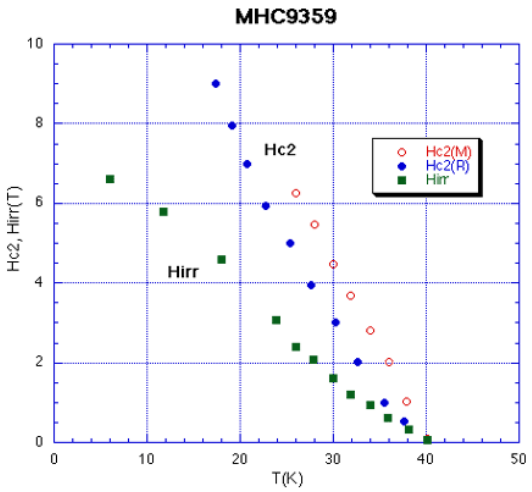


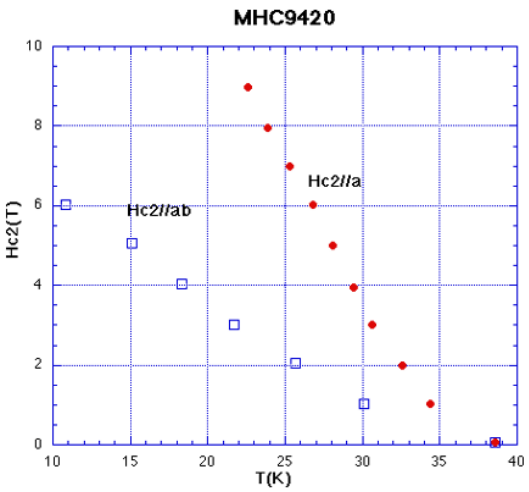


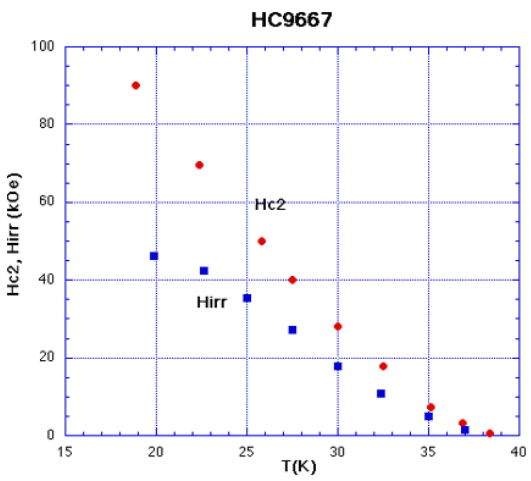
6．The upper critical field, Hc2(0)　T　　and　　dHc2/dT at Tc.　T/K

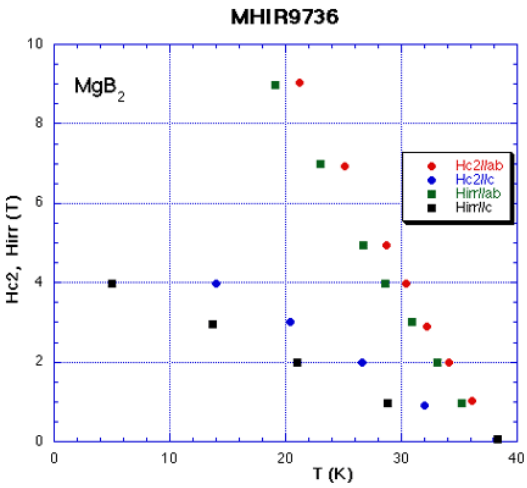
紙面の関係上、コメントは省いてあります。試料の詳細はデータベースからダウンロードしてください。

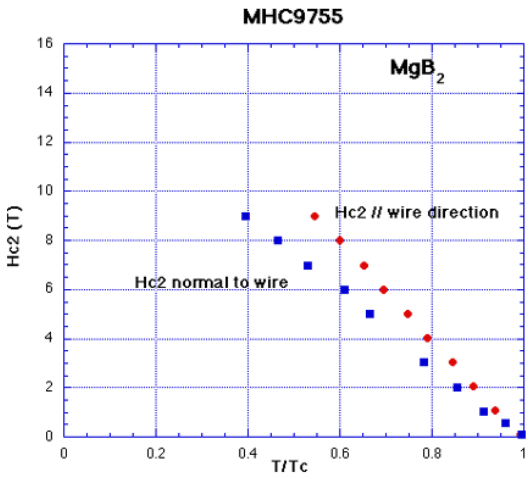
Hc2(poly)	Hc2//ab	Hc2//c	dHc2/dT(poly)	(dHc2/dT)//ab	(dHc2/dT)//c	reference	
12.5			0.44			PRL0862420	MHC9359
16.4						MAT0102413	
	25.5	9.2				APL0792779	
18			0.74			MAT0102167	MHC9420
15.2			0.57			PHC3630001	HC9667
	15	4.8		0.55	0.17	P064212509	MHIR9736
15			0.39			APL0791649	MHC3755
15.5						SSC1210575	
25						PHC3690250	MHC9923
	21	7.3				P065140501	
	13	3.1		0.515	0.117	P065180505	
		3				P066014504	
	17	3.5				P066180502	MHC11200
		3.5				P067012505	
	14.1	3.51			0.13	P068104513	MHC11490
			0.4			JET0730570	
			0.4			P064172501	

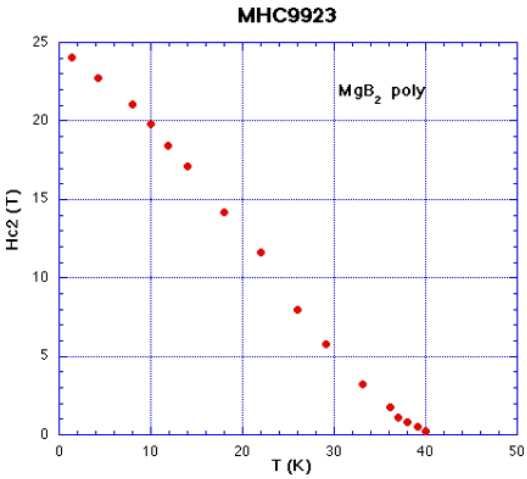


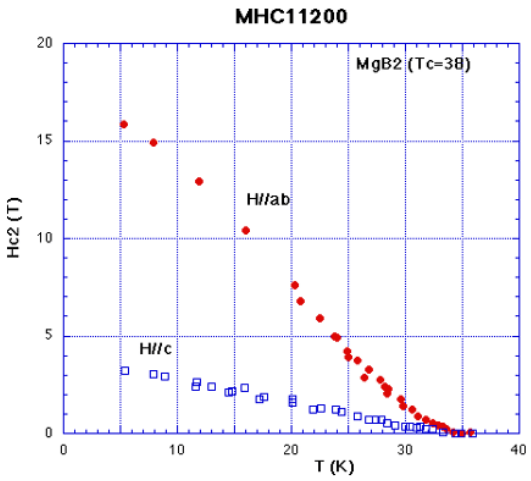


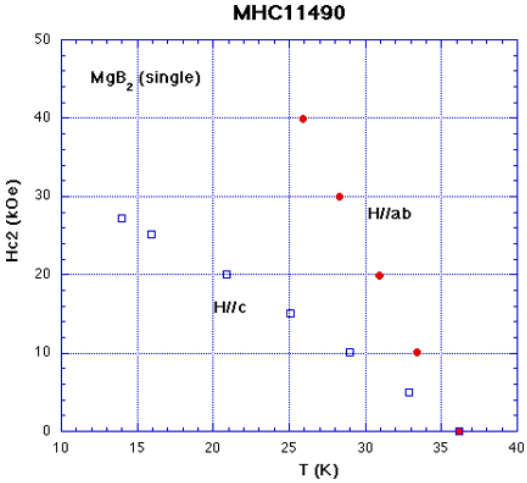

HC9667
Hc2, Hirr (kOe)
T(K)
Hc2
Hirr


MHIR9736
MgB2
Hc2, Hirr (T)
T (K)
Hc2//ab
Hc2//c
Hirr//ab
Hirr//c


MHC9755
MgB2
Hc2 (T)
T/Tc
Hc2 // wire direction
Hc2 normal to wire


MHC9923
MgB2 poly
Hc2 (T)
T (K)


MHC11200
MgB2 (Tc=38)
Hc2 (T)
T (K)
H//ab
H//c


MHC11490
MgB2 (single)
Hc2 (kOe)
T (K)
H//ab
H//c

7. Coherence length A

cohere(poly)	cohere<ab>	cohere<c>		
50			MAT0102289	
52			PRL0862420	B<10>
	65	25	APL0792779	
47			PHC3630001	
	82	27	P064212509	
45			APL0791649	PIT sample
	55		L088047002	
46			SSC1210575	
36			PHC3690250	
	68	23	P065140501	
	118	28	P065180505	
	94		P067012505	
	95	17.6	P068104513	

8. penetration depth A

penet(poly)	penet<ab>	penet<c>	reference	
1400			PRL0862420	
1600			MAT0106166	
	850		P064094514	
1700			P064094522	
1800			P064172501	
	1100		L088047002	
2300			SSC1210575	
	1000		P065094512	
1420			PHC3700006	
4500			P066014505	
1020			P066104521	c-axis oriented films
1070			P066104521	c-axis oriented films

９．G-L parameter

26 [P064094522] [PHC3700006]

１０．Anisotropy factor

2.6	APL0792779
<1.5	P064172501
2.7	JPS0702255
3	P065100510
3	PHC3700006
4.2	P065180505
5	P066180502
3	P068104513
4.5	P068104513
2.2-3	P065140501

１１．Energy gap 2Δ/kTc

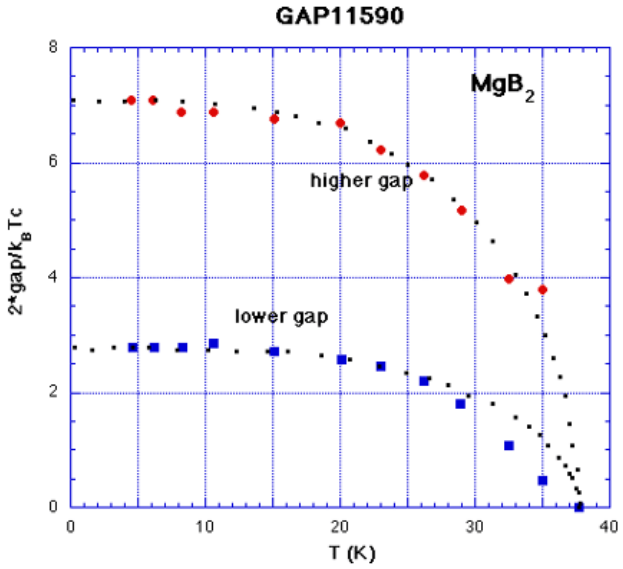
Two gap として測定値が示されたものは lower gap の値を gap(L) に示した。データは 2Δ/kTc の値である。

method (scanning tunneling microscopy (STM), point contact tunneling (PC), photoemission (PE), estimation from penetration depth (PENET), far-infrared refrection (FIR), surface impedance (SI), specific heat (SP), Raman shift (RM))

reference	Tc	gap	gap (L)	method
PRL0864915	39.5	3		PE
PRL0864374	39	3		STM
PRL0865582	37.5	1.24		STM
P063220504	39	2.56		PC
P063220508	39	3.5		STM
P064060506	39	2.8		PC
MAT0106166	39	1.7		PENET
MAT0108107	39	1.54		PENET
EPJ0210159	39	2.38		FIR
P064180501	39.4	1.54		PENET
L088047002	38	1.57		
P065094512	38.2	3.6	1.6	

L088087001	38.2	3.96		RM
PHC3680251	38	2.45	1.59	
P065184516		5.31	1.18	
P066014505	38.3	2.1		PENET
PHC3770202	38	4.89	1.65	PC
P066104521	39	2.26		
P066104521	36	2.06		
APL0813603	31	1.44		
L087137005	39.3	4.14	1.67	PC
P067094504	39.2	5	1.2	PC
PHB3280023	39	5		PC
P068094514	38	3.77	1.17	SP
L089247004	38.2	4.32	1.1	PC

Temperature dependence of energy gap [L089247004]



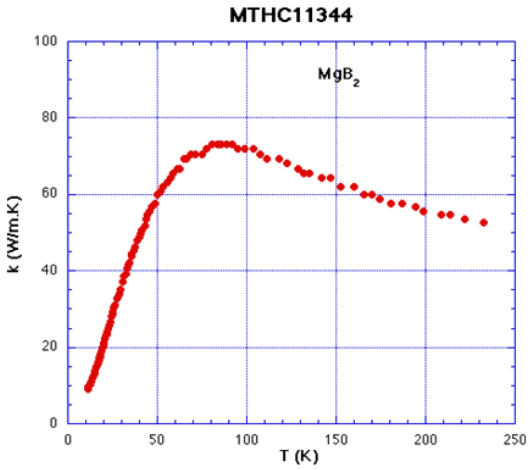
12. Electro specific heat coefficient mj/mol.K2

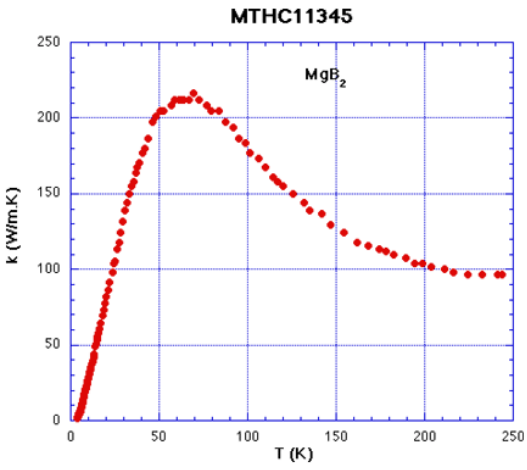
3	PRL0861877
2.6	L087047001
3	P068094514

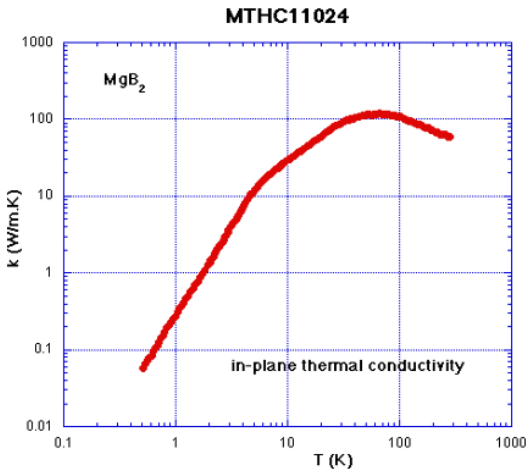
13. Debye temperature K

Debye-T	reference	method
750	PRL0861877	B<11>, SP
800	PHC3630001	
1100	P065100510	R
880	P066180504	R
1050	L087047001	SP
1130	P067064505	THC
1190	P067064505	THC
898.5	PHC3700211	R
670	P068094514	SP

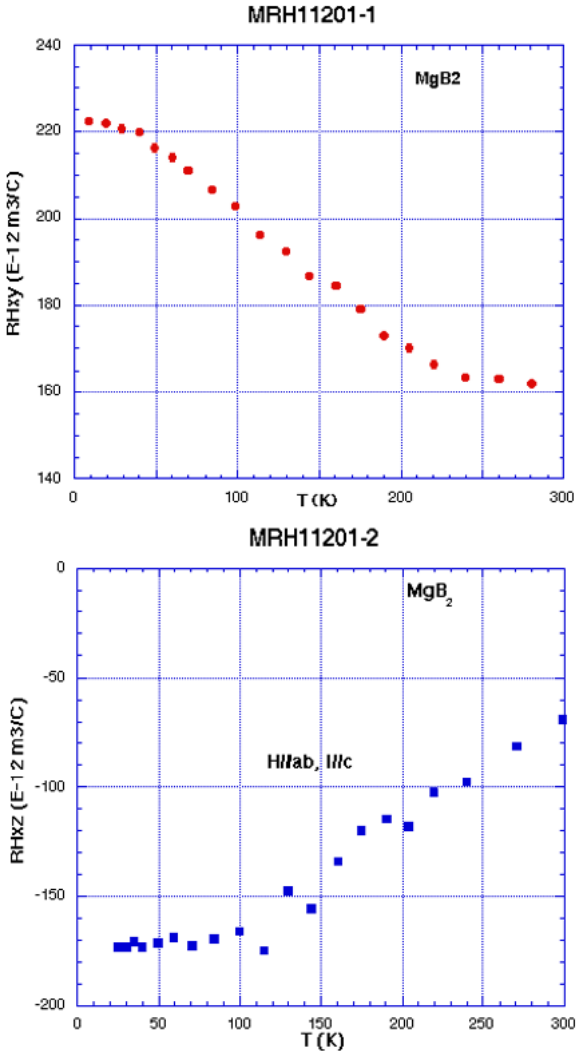
14. Thermal conductivity



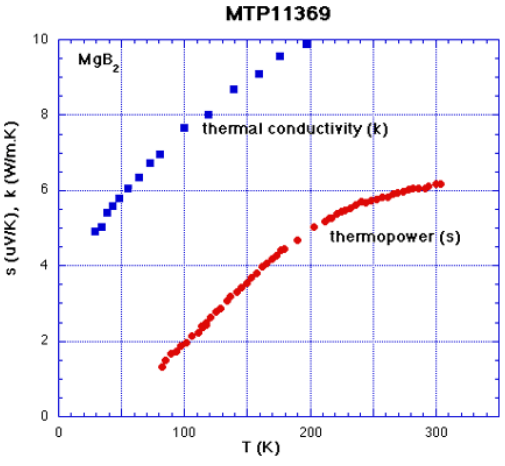




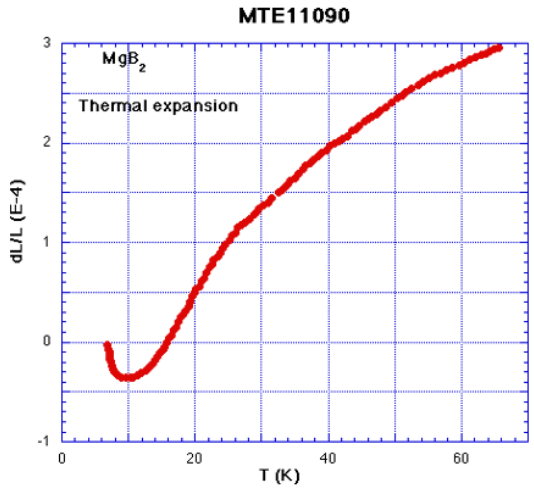
15. Hall coefficient



16. Thermopower



１７．Thermal expansion



References

文献は雑誌名（英文字）＋Vol（３桁）＋ page で表されている。雑誌名は次の通り。
なお、不明の場合はデータベースを見てください。

APL	Appl.Phys.Lett.
EPJ	Eur.Phys.J.B
JET	JETP Lett.
JP	J.Phys.:Condens.Matter
JPS	J.Phys.Soc.Jpn
L	Phys.Rev.Lett.
MAT	e-print, cond-mat
NAT	Nature
P	Phys.Rev.B
PHB	Physica B
PHC	Physica C
PRL	Phys.Rev.Lett.
SCI	Science
SSC	Solid State Commun.