Elastic Properties of Minerals Important to Geophysics
Elasticity Data Tables

All C_{ij} are adiabatic.

M: C_{ij}, K_S, and G in GPa at ambient P,T unless noted otherwise
$\partial M/\partial P$: $(\partial C_{ij}/\partial P)_T$, $(\partial K_S/\partial P)_T$, and $(\partial G/\partial P)_T$ at ambient P,T unless noted otherwise
$\partial M/\partial T$: $(\partial C_{ij}/\partial T)_P$, $(\partial K_S/\partial T)_P$, and $(\partial G/\partial T)_P$ in 10^{-2} GPa K^{-1} at ambient P,T unless noted otherwise
$\partial^2 M/\partial P^2$: $(\partial^2 C_{ij}/\partial P^2)_T$, $(\partial^2 K_S/\partial P^2)_T$, and $(\partial^2 G/\partial P^2)_T$ in 10^{-2} GPa^{-1} at ambient P,T unless noted otherwise
$\partial^2 M/\partial T^2$: $(\partial^2 C_{ij}/\partial T^2)_P$, $(\partial^2 K_S/\partial T^2)_P$, and $(\partial^2 G/\partial T^2)_P$ in 10^{-6} GPa K^{-2} at ambient P,T unless noted otherwise
$\partial^2 M/\partial P\partial T$: $(\partial^2 C_{ij}/\partial P\partial T)$, $(\partial^2 K_S/\partial P\partial T)$, and $(\partial^2 G/\partial P\partial T)$ in 10^{-3} K^{-1} at ambient P,T unless noted otherwise
ρ: density in 10^{-3} kg m^{-3}

Pressure and temperature range of experiments are noted even though derivatives are at ambient conditions.

Minerals groups arranged according crystal symmetry.
Subgroups of minerals arranged alphabetically according to chemical formula.

Monoclinic Crystals

Clinopyroxene (Abbreviations: di - diopside ($CaMgSi_2O_6$); he - hedenbergite ($CaFeSi_2O_6$); jd - jadeite ($NaAlSi_2O_6$); cr - ($NaCrSi_2O_6$); ts - ($MgAl(AlSi)O_6$))

Material	Property	ρ	11	22	33	44	55	66	12	23	13	35	46	25	15	K	G	Source/Notes
$CaFeSi_2O_6$ hedenbergite	*M*	3.657	222	176	249	55	63	60	69	86	79	26	-10	13	12	120	61	Kandelin & Weidner (1988a)
$di_{72}he_9jd_3cr_3ts_{12}$	*M*	3.327	273.8	183.6	229.5	76.5	73.0	81.6	84	60	80	48.1	8.4	10	9.0	117.2	72.2	Collins & Brown (1998)
$CaMgSi_2O_6$ diopside	*M*	3.289	223	171	235	74	67	66	77	57	81	43	7.3	7	17	108	65.1	Levien et al. (1979); nearly pure end-member
	M	3.31	204	175	238	67.5	58.8	70.5	84.4	48.2	88.3	-33.6	-11.3	-19.6	-19.3	114	64.9	Aleksandrov et al. (1964); crystal chemical composition not provided
$(Ca,Na,Mg,Fe^{+2},Mn,Fe^{+3},Al,Ti)_2(Si,Al)_2O_6$ augite	*M*	3.32	181.6	150.7	217.8	69.7	51.1	55.8	73.4	72.4	33.9	24.6	4.3	16.6	19.9	95.4	59.0	Aleksandrov et al. (1964); crystal chemical composition not provided
$(Ca,Na,Mg,Fe^{+2},Mn,Fe^{+3},Al,Ti)_2(Si,Al)_2O_6$ diallage	*M*	3.30	153.9	149.6	210.8	63.9	62.2	52.3	56.9	30.5	37.4	11.9	-8.6	14.2	14.6	84.8	61.2	Aleksandrov et al. (1964); crystal chemical composition not provided
$LiAlSi_2O_6$ spodumene	*M*	3.19	245	199	287	70.1	62.8	70.7	88	69	64	-14.2	-7.1	-26.7	-40	123.5	72.0	Every & McCurdy (1992); Bass (1995)
$NaFeSi_2O_6$ acmite (also aegirite)	*M*	3.50	185	184	234	62	51	47	68	70	62	21	7	9	9	106	58	Aleksandrov et al. (1964); crystal chemical composition not provided
$NaAlSi_2O_6$ jadeite	*M*	3.33	274	253	282	88	65	94	94	82	71	28	13	14	4	143	85	Kandelin & Weidner (1988b);
$jd_{58}di_{30}$ omphacite	*M*	3.327	257	216.2	260.2	80.2	70.6	85.8	86	72	76	33.7	10.2	13	7.1	131	79.2	Bhagat et al. (1992); minor Ts present; minor Ca vacancies in enstatite
$(Na,Ca)(Fe^{+3},Fe^{+2},Mg)Si_2O_6$ aegerite-augite	*M*	3.42	155.6	151.8	216.1	40.0	46.5	49.2	81.1	68.4	66.0	19.2	4.1	26.0	25.3	101	46.8	Aleksandrov et al. (1964); crystal chemical composition not provided

Feldspars (Abbreviations: ab - albite ($NaAlSi_3O_8$); an - anorthite ($CaAl_2Si_2O_8$); or - orthoclase ($KAlSi_3O_8$))

$(Ba,K)Al_2Si_{12}O_8$ hyalophane	*M*		67.4	161	124	13.6	25.3	35.4	42.9	25.6	45.1	-15.8	-1.7	-7.6	-12.8	58.4	26.8	Every & McCurdy (1992); Bass (1995)
$CaAl_2Si_2O_8$ anorthite	*M*		124	205	156	23.5	40.4	24.2	-3.0	-0.7	-24	2.2	1.2	-0.7	-3.6	84.2	39.9	Every & McCurdy (1992); Bass (1995)
an(50-70%)-ab(30-50%) Labradorite	*M*		99.4	158	150	21.7	34.5	37.1	62.8	26.7	48.7	-12.4	-5.4	-10.7	-2.5	74.5	33.7	Every & McCurdy (1992); Bass (1995)
$KAlSi_3O_8$ microcline (triclinic quasi monoclinic)	*M*		67.0	169	118	14.3	23.8	36.4	45.3	20.4	26.5	-15.0	-1.9	-12.3	-0.2	55.4	28.1	Every & McCurdy (1992); Bass (1995)
$KAlSi_3O_8$ orthoclase	*M*		80.8	163	124	18.7	27.1	35.7	37.9	32.7	52.9	-6.0	-0.9	-23.7	-15.7	62.0	29.3	Every & McCurdy (1992); Bass (1995)
$NaAlSi_3O_8$ albite	*M*		74	131	128	17.3	29.6	32.0	36.4	31.0	39.4	-20.0	-2.5	-12.8	-6.6	56.9	28.6	Every & McCurdy (1992); Bass (1995)
								Alkali feldspar (orthoclase-albite) solid solution										
(subscripts show weight percent)																		
$or_{79}ab_{19}an_2$	*M*	2.56	62.5	172	124	14.8	22.2	37.5	41.9	18.7	34.3	-11.0	-2.9	-15.2	-15.7	54	27	Every & McCurdy (1992); Bass (1995);
$or_{75}ab_{22}$	*M*	2.54	57.0	148	102	14.0	20.9	31.7	33.7	17.7	33.6	-11.4	-2.2	-11.2	-12.6	47	24	based on recalculation by Aleksandrov et
$or_{67}ab_{29}$	*M*	2.54	58.4	146	98.5	12.7	18.8	34.1	35.5	19.1	33.9	-13.2	-2.7	-8.4	-10.2	48	24	al. (1974) of earlier data; triclinic quasi-
$or_{54}ab_{35}an_9$	*M*	2.58	63.0	152	118	9.9	26.9	35.4	38.4	35.7	48.5	-21.3	-1.9	-2.2	-12.5	57	24	monoclinic symmetry
$or_{65}ab_{27}an_4$	*M*	2.57	59.7	158	105	14.0	20.0	37.1	36.9	26.7	35.5	-12.5	-2.6	-6.6	-12.0	51	25	
$or_{74}ab_{19}an_2$	*M*	2.57	61.9	159	100	14.1	19.5	35.7	43.7	21.0	36.5	-12.0	-2.0	-0.4	-10.3	53	25	
								Plagioclase feldspar (albite-anorthite) solid solution										
$ab_{91}an_9$	*M*		74.8	137	129	17.4	30.2	31.8	28.9	21.5	38.1	-19.2	-2.1	-30.7	-9.1	50.8	29.3	Every & McCurdy (1992); Bass (1995);
$ab_{76}an_{24}$	*M*		82	145	133	18.1	31.0	33.5	39.8	33.7	41.0	-18.7	-1.0	-6.3	-8.4	62.0	30.6	based on compilation of Aleksandrov et
$ab_{71}an_{29}$	*M*		84.4	151	132	18.9	31.4	34.2	42.1	32.2	40.9	-18.8	-1.1	-6.5	-8.5	63.0	31.4	al. (1974) of earlier data; $ab_{91}an_9$
$ab_{47}an_{53}$	*M*		97.1	163	141	20.1	33.1	36.1	51.9	35.8	44.0	-15.0	-1.4	-9.8	-9.4	70.7	33.6	apparently mislabeled in Every &
$ab_{44}an_{53}$	*M*		98.8	173	141	20.5	34.3	36.8	52.9	37.2	43.7	-18.0	-1.3	-7.4	-10.2	71.9	34.5	McCurdy
Other																		
$Ca_2(Al,Fe)_3Si_3O_{12}(OH)$ epidote	*M*		211.8	238.7	202.0	39.1	43.2	77.5	66.3	45.6	45.2	-14.3	-3.4	-8.2	0.0	106.2	61.2	Bass (1995)
$(Ca,Na)_{2\text{-}3}(Mg,Fe,Al)_5(Al,Si)_8O_{22}(OH)_2$ Hornblende	*M*	3.12	116.0	159.7	191.6	57.4	31.8	36.8	44.9	65.5	61.4	10.0	-6.2	-2.5	4.3	87.0	43.0	Hearmon (1984); Bass (1995)

	M	3.15	130.1	187.7	198.4	61.1	38.7	45.0	61.4	61.4	59.2	-40.6	-0.9	-6.9	9.5	93.3	49.3	Hearmon (1984); Bass (1995)
$CaSO_4 \cdot 2H_4O$ gypsum	*M*	2.317	78.6	62.7	72.6	9.1	26.4	10.4	41.0	24.2	26.8	-17.4	-1.6	-1.6	3.1	42.0	15.4	Every & McCurdy (1992); Bass (1995)
	M	2.317	94.5	65.2	50.2	8.6	32.4	10.8	37.9	32.0	28.2	-7.5	-1.1	6.9	-11.0	42.5	15.7	Every & McCurdy (1992); Bass (1995)
$KAl_3Si_3O_{10}(OH)_2$ muscovite	*M*	2.844	184.3	178.4	59.1	16.0	17.6	72.4	48.3	21.7	23.8	1.2	0.5	3.9	-2.0	58.2	35.3	Vaughan & Guggenheim (1986)
$Mg_{4.69}Fe_{0.27}Ti_{0.02}Mn_{0.01}(SiO_4)2F_{0.63}(OH)_{1.33}O_{0.04}$ chondrodite	*M*	3.23	213	275	198	69.7	72.1	75.2	70	67	59	-2.6	-0.7	-1.7	7.2	118	75.6	Sinogeikin & Bass (1999)
$4(Mg,Fe)_2SiO_4 \cdot Mg(OH,F)_2$ clinohumite	*M*	3.261	212	296	191	72.0	65	74.3	66	72	80	2	-0.6	1	-0.3	125	73	Fritzel & Bass (1997)
SiO_2 coesite	*M*	2.911	160.8	230.4	231.6	67.8	73.3	58.8	82.1	35.6	102.9	-39.3	9.9	2.6	-36.2	113.7	94.7	Weidner & Carleton (1977)

Orthorhombic Crystals

Material	Property	ρ	11	22	33	44	55	66	12	23	13	K	G	Source/Notes
Olivine structure														
Al_2BeO_4 chrysoberyl	M	3.72	528	439	466	144.4	145.8	151.8	125	128	111	240	160	Wang et al. (1975)
$(Ca_{1.01}Mg_{0.85}Fe_{0.12}Mn_{0.02})$ SiO_4 monticellite	M	3.116	215.9	149.6	183.5	50.6	56.5	59.2	59.4	77.4	71	106	55.2	Peercy & Bass (1990)
Co_2SiO_4	M	4.706	307.8	194.7	234.2	46.7	63.9	64.8	101.6	103.2	105.0	148.2	62.0	Sumino (1979)
	$\partial M/\partial T$	4.706	-3.31	-2.12	-3.37	-0.49	-1.02	-1.01	-1.83	-1.36	-1.36	-1.95	-0.77	293-673 K; deriv. ave. 303-473 K
Fe_2SiO_4 fayalite	M	4.393	266	168	232	32.3	46.5	57	94	92	92	134	50.7	Isaak et al. (1993); preferred value from
	$\partial M/\partial T$	4.393	-5.1	-4.1	-4.3	-0.92	-0.80	-2.0	-2.3	-0.72	-1.2	-2.4	-1.3	using new and existing data; 300-500 K
	$\partial^2 M/\partial T^2$	4.393				39	27	25		-23			24	
	M	4.38	265.9	160.3	222.4	31.6	46.7	57.2	92	88	81	127.9	50.3	Graham et al. (1988)
	$\partial M/\partial P$	4.38	7.4	5.3	5.2	2.5	1.4	1.7	6.1	3.5	5.7	5.2	1.5	0-1 GPa
	$\partial M/\partial T$	4.38	-5.2	-5.2	-3.8	-0.98	-0.96	-1.8	-2.7	-1.5	-1.2	-3.0	-1.3	273-313 K
	M	4.400	267.0	173.6	239.2	32.4	46.7	57.3	95.2	97.9	98.7	137.9	50.9	Sumino (1979)
	$\partial M/\partial T$	4.400	-4.09	-3.47	-4.59	-0.52	-0.48	-1.76	-1.68	-0.54	-0.86	-2.05	-1.08	293-673 K; deriv. ave. 298-473 K
Mg_2GeO_4	M	4.030	312	187	217	57.2	66.1	71	60	66	65	120	72	Weidner & Hamaya (1983)
Mg_2SiO_4 forsterite	M						81.9							Chen et al. (1996); only value enumerated;
	$\partial M/\partial P$						1.41							0-13 GPa; ρ not given; $\partial^2 M/\partial P^2$~0
	$\partial M/\partial P$		6.1	5.1	4.7	1.6	1.3	1.7	4.6	3.5	3.4	4.2	1.4	Zha et al. (1996); Duffy et al. (1995) 3-16 GPa; $\partial C_{ij}/\partial P$ from graphs in ref.
	M	3.226	329.3	199.7	236.7	67.5	81.9	81.3	66.0	72.1	68.2	128.7		Yoneda & Morioka (1992)
	$\partial M/\partial P$	3.226	7.22	5.24	5.57	2.01	1.46	2.16	3.59	2.94	3.62	4.19	1.7	0-6 GPa
	$\partial^2 M/\partial P^2$	3.226		-4.7	-5.1	-9.4	-7.1	-2.1	-2.5	-0.9	+7.7	-7.2	-1.8	-4.4
	M	3.222	330.0	200.3	236.2	67.1	81.6	81.2	66.2	72.2	68.0	128.8	81.8	Isaak et al. (1989)
	$\partial M/\partial T$	3.222	-3.64	-2.76	-2.89	-1.38	-1.47	-1.65	-1.09	-0.63	-0.94	-1.57	-1.35	300-1700 K

	$\partial^2 M/\partial T^2$	3.222	-12	-10	-12							-5.2	-2.6	T<760 K
			-7		-4							-0.7		T>760 K
	M	3.225	328.7	199.8	235.5	66.8	80.9	80.6	66.6	72.7	68.4	128.8	81.2	Suzuki et al. (1983)
	$\partial M/\partial T$	3.225	-3.84	-2.69	-2.94	-1.23	-1.25	-1.41	-1.11	-0.68	-1.23	-1.59	-1.27	300-1200 K
	M	3.220	327.3	200.4	235.4	67.0	81.2	80.7	67.3	73.2	69.1	129.2	81.2	Sumino et al. (1977)
	$\partial M/\partial T$	3.220	-4.31	-2.87	-2.66	-1.29	-1.33	-1.61	-0.97	-0.41	-1.11	-1.60	-1.35	83-673 K; $(\partial M/\partial T)_P$ average from 298-673 K
	M	3.221	329	200.5	236.3	67.2	81.4	81.1	66.3	72.8	68.4	129.1	81.6	Graham & Barsch (1969)
	$\partial M/\partial P$	3.221	8.32	5.93	6.21	2.12	1.65	2.32	4.30	3.53	4.23	4.97	1.82	0-1 GPa
	$\partial M/\partial T$	3.221	-3.89	-3.11	-2.69	-1.30	-1.44	-1.63	-1.17	-0.92	-0.87	-1.76	-1.36	300-700 K
	M	3.224	328.4	199.8	235.3	65.9	81.2	80.9	63.9	73.8	68.8	128.9	81.1	Kumazawa & Anderson (1969)
	$\partial M/\partial P$	3.224	8.47	6.56	6.37	2.12	1.66	2.37	4.67	4.11	4.84	5.37	1.80	0-0.2 GPa
	$\partial M/\partial T$	3.224	-3.31	-2.81	-2.83	-1.30	-1.32	-1.51	-1.04	-0.46	-0.82	-1.50	-1.30	297.5-306 K
	M	~3.20										128	80	Li et al. (1996a, 1998b); polycrystal
	$\partial M/\partial P$	~3.20										4.44	1.32	0-12.5 GPa
$(Mg_{1.85}Fe_{0.15})SiO_4$ olivine	*M*	3.311	323.7	197.6	235.1	64.6	78.1	79.0	66.4	75.6	71.6	129.4	79.1	Kumazawa & Anderson (1969)
	$\partial M/\partial P$	3.311	7.98	6.37	6.38	2.17	1.64	2.31	4.74	3.76	4.48	5.13	1.79	0-0.2 GPa
	$\partial M/\partial T$	3.311	-3.40	-2.85	-2.86	-1.28	-1.30	-1.57	-1.05	-0.51	-0.94	-1.56	-1.30	297.5-306 K
$(Mg_{1.84}Fe_{0.16})SiO_4$ olivine	*M*	3.330	325.5	198.8	236.9	64.4	78.3	78.8	70.6	75.8	72.5	131.0	78.8	Isaak (1992)
	$\partial M/\partial T$	3.330	-3.88	-2.99	-3.39	-1.27	-1.36	-1.57	-1.04	-0.57	-0.87	-1.69	-1.38	296-1400 K
	M	3.299	319	192	238	63.8	78.3	79.7	59	72	76	126.7	79.0	Ohno (1976); minor amounts of Ni
$(Mg_{1.83}Fe_{0.17})SiO_4$ olivine	*M*	3.316	324	196	232	63.9	77.9	78.8	72	69	72	128.1	78.7	Ohno (1976); minor amounts of Ni
$(Mg_{1.83}Fe_{0.17})SiO_4$ olivine	*M*	3.324	324	198	249	66.7	81.0	79.3	59	78	79	131.2	80.9	Verma (1976)
$(Mg_{1.81}Fe_{0.19})SiO_4$ olivine	*M*	3.347	320.2	195.9	233.8	63.5	76.9	78.1	67.9	78.5	70.5	129.5	77.5	Webb et al. (1989)
	$\partial M/\partial P$	3.347	7.98	5.32	6.00	2.65	1.80	2.46	4.07	3.11	4.55	4.64	1.94	ρ average of 4 specimens; 0-3 GPa
	$\partial^2 M/\partial P^2$	3.347	-24	-11	-26	-14	-12	-18	-12	-16	-5	-15	-11	

$(Mg_{1.80}Fe_{0.20})SiO_4$ olivine	M						77.2							Chen et al. (1996); only value enumerated;
	$\partial M/\partial P$						1.56							0-13 GPa; ρ not given; $\partial^2 M/\partial P^2$~0
	M	3.353	320.9	197.1	234.7	63.6	77.5	78.1	69.6	75.1	71.2	129.4	78.0	Isaak (1992)
	$\partial M/\partial T$	3.353	-4.02	-3.10	-3.53	-1.26	-1.30	-1.56	-1.14	-0.72	-0.96	-1.80	-1.36	295-1500 K
	M	3.362										129.0	77.6	Zaug et al. (1993)
	$\partial M/\partial P$	3.362										4.56	1.71	0-12.5 GPa
	$\partial^2 M/\partial P^2$	3.362										-10	-12	Incorrectly given as (1/2)($\partial^2 M/\partial P^2$) in ref.
$(Mg_{1.78}Fe_{0.22})SiO_4$ olivine	M	3.355	320.5	196.5	233.5	64.0	77.0	78.7	68.1	76.8	71.6	129.4	78.0	Abramson et al. (1997); minor Ca, Ti
	$\partial M/\partial P$	3.355	6.54	5.38	5.51	1.67	1.81	1.93	3.86	3.37	3.57	4.46	1.71	0-17 GPa; with linear fit $\partial K_S/\partial P$ is 4.29
	$\partial^2 M/\partial P^2$	3.355					-7.0					-3.6	-5.4	
$(Mg_{1.78}Fe_{0.22})SiO_4$	M	3.370	320.1	195.4	233.9	61.3	77.2	78.0	70.1	73.6	70.1			Brown et al. (1989); minor Ca, Ni, Mn
Mn_2SiO_4 tephroite	M	4.129	258.4	165.6	206.8	45.3	55.6	57.8	87.1	91.7	95.2	128.8	54.6	Sumino (1979)
	$\partial M/\partial T$	4.129	-3.50	-2.83	-2.85	-0.94	-1.21	-1.36	-1.63	-1.12	-1.44	-1.95	-1.04	293-673 K; deriv. ave. 303-473 K
Ni_2SiO_4	M	4.933	340	238	253	71	87	78	109	113	110	165	80	Bass et al. (1984)
Olivine (β-phase)														
Mg_2SiO_4	M	3.489	371	368	272	111	123	103	66	105	95	170	115	Zha et al. (1997); 0-14 GPa Single-crystal derivatives not tabulated
	M	3.474	360	383	273	112	118	98	75	105	110	174	114	Sawamoto et al. (1984)
	M	3.470										172	113	Li et al. (1998a); polycrystal
	$\partial M/\partial P$	3.470										4.2	1.5	0-7 GPa
	$\partial M/\partial T$	3.470										-1.2	-1.7	273-873 K
	M	~3.45										170	108	Li et al. (1996a, 1998b); polycrystal
	$\partial M/\partial P$	~3.45										4.2	1.5	0-12.5 GPa
$Mg_{1.84}Fe_{0.16}SiO_4$	M	3.57	348	372	254	106	115	97	78	105	102	170	108	Sinogeikin et al. (1998)
Perovskite														

$CaTiO_3$	$\partial M/\partial P$	4.043										5.78	1.48	Kung & Rigden (1999); polycrystal; 0-3 GPa;
	M	4.03										175	107	Sinelnikov et al. (1998a); polycrystal
	M	4.014										177	105	Fischer et al. (1993); polycrystal
	$\partial M/\partial P$	4.014										5.1	1.44	0-3 GPa
	$\partial M/\partial P$	4.043										(6.0)	(1.6)	recalculated by Kung & Rigden (1999)
$Ca(Ti_{0.77}Si_{0.23})O_3$	M	4.043										182	107	Sinelnikov et al. (1998a); polycrystal
$Ca(Ti_{0.51}Si_{0.49})O_3$	M	4.11										188	109	Sinelnikov et al. (1998a); polycrystal
$EuAlO_3$	M	7.246										213	123	Kung & Rigden (1999); polycrystal
	$\partial M/\partial P$	7.246										4.89	1.33	0-3 GPa; corrected for porosity
$CdTiO_3$	M	6.331										214	105	Kung & Rigden (1999); polycrystal
	$\partial M/\partial P$	6.331										6.36	1.49	0-3 GPa; corrected for porosity
$CdSnO_3$	M	7.615										185	87	Kung & Rigden (1999); polycrystal
	$\partial M/\partial P$	7.615										5.09	0.88	0-3 GPa; corrected for porosity
$GdAlO_3$	$\partial M/\partial P$	7.445										5.12	1.82	Kung & Rigden (1999); polycrystal; 0-3 GPa; corrected for porosity
$GdAlO_3$	M	7.443	391	302	343	155	142	101	124	126	154	203	120	Bass (1984)
$MgSiO_3$	M	4.108	482	537	485	204	186	147	144	146	147	264	177	Yeganeh-Haeri (1994)
	M	4.108	515	525	435	179	202	175	117	139	117	246	184	Yeganeh-Haeri et al. (1989)
	M	4.06											175	Sinelnikov et al. (1998b); polycrystal
	$\partial M/\partial P$	4.06											1.8	0-8 GPa
	$\partial M/\partial T$	4.06											-2.9	273-800 K
$NaMgF_3$	M	3.058	125.7	147.3	142.5	46.7	44.8	50.4	49.5	43.1	45.1	75.7	46.7	Zhao & Weidner (1993)
$SmAlO_3$	M	7.178	403	328	334	152	144	94	115	103	147	197	122	Bass (1984)
$ScAlO_3$	M	4.23										217	127	Kung et al. (2000); ave. of two polycrystalline
	$\partial M/\partial P$	4.23										3.8	1.9	specimens; 0-3 GPa

	M	4.284	424	420	395	179	129	163	129	198	174	249	140	Bass (1984)
<u>Pyroxene</u>														
$FeSiO_3$ ferrosilite	*M*	4.002	198	136	175	59	58	49	84	55	72	101	52	Bass & Weidner (1984)
$MgSiO_3$ enstatite	*M*	3.194	233	171	216	83	79	87	73	50	56	108	76.8	Jackson et al. (1999)
	M	3.198	225	178	214	78	76	82	72	53	54	108	76	Weidner et al. (1978)
	M	3.18										104	75	Flesch et al. (1998); polycrystal
	$\partial M/\partial P$	3.18										10.9	1.6	0-10 GPa
	$\partial^2 M/\partial P^2$	3.18										-160		
$(Mg_{0.94}Fe_{0.06})SiO_3$	*M*	3.272	229	167	194	80	76	77	74	47	50	102.2	73.9	Duffy & Vaughan (1988)
$(Mg_{1.64}Fe_{0.17}Ca_{0.04}Mn_{0.07})$	*M*	3.304	236.9	180.5	230.4	84.3	79.4	80.1	79.9	56.8	63.2	115.5	78.1	Chai et al. (1997b)
$(Al_{0.12}Cr_{0.01})(Si_{1.98}Al_{0.11})O_6$	$\partial M/\partial P$	3.304	10.27	8.87	11.07	1.23	0.75	2.78	6.22	7.26	6.63	7.82	1.45	0-12.5 GPa
	$\partial^2 M/\partial P^2$	3.304	-47	-38	-53				-33	-31	-26	-35		
$(Mg_{0.84}Fe_{0.16})SiO_3$	*M*	3.335	229.9	165.4	205.7	83.06	76.4	78.5	70.1	49.6	57.3	105.0	75.5	Kumazawa (1969)
$(Mg_{0.8}Fe_{0.2})SiO_3$ bronzite	*M*	3.373	231	170	216	81	44	67	76	70	59	112	63	Webb & Jackson (1993)
	$\partial M/\partial P$	3.373	11.0	10.7	16.1	2.26	2.65	2.76	7.8	8.5	14.0	10.8	2.06	0-3 GPa
	$\partial^2 M/\partial P^2$	3.373	-96	-111	-230	-27	-42	-23	-101	-70	-380	-160	-12	
	M	3.354	228.6	160.5	210.4	81.75	75.48	77.6	71.0	46.0	54.8	103.5	75.5	Frisillo & Barsch (1972)
	$\partial M/\partial P$	3.354	11.04	9.19	16.42	2.38	2.92	2.75	6.97	8.73	9.09	9.59	2.38	0-0.45 GPa
	$\partial^2 M/\partial P^2$	3.354				-28.1	-59.5	-17.3	50.7	62.0	66.3			
	$\partial M/\partial T$	3.354	-3.52	-3.28	-5.16	-1.31	-1.38	-1.45	-2.12	-3.18	-1.07	-2.68	-1.19	398-623 K
$(Mg_{1.6}Li_{0.2}Sc_{0.2})Si_2O_6$ protoenstatite	*M*	3.052	213	152	246	81	44	67	76	70	59	112	63.2	Vaughan and Bass (1983)
<u>Other Oxides</u>														
$Al_2(F,OH)_2SiO_4$ topaz	*M*	3.563	281	349	294	108	132	131	125	88	84	167.4	114.8	Hearmon (1979); Bass (1995)
Al_2SiO_5 andalusite	*M*	3.145	233.4	289.0	380.1	99.5	87.8	112.3	81.4	97.7	116.2	162.0	99.1	Vaughan & Weidner (1978)

Al_2SiO_5 sillimanite	*M*	3.241	287.3	231.9	388.4	122.4	80.7	89.3	94.7	158.6	83.4	170.8	91.5	Vaughan & Weidner (1978)
Ba_2SO_4 barite	*M*	4.473	89.0	81.0	107	12.0	28.1	26.9	47.9	29.8	31.7	55.0	22.8	Hearmon (1979); Bass (1995)
		4.473	95.1	83.7	110.6	11.8	29.0	27.7	51.3	32.8	33.6	58.2	23.2	Bass (1995)
$CaBSi_4O_4OH$ datolite	*M*	3.05	215	155	110	37.1	50.3	78.5	44	41	50	80.4	53.6	Hearmon (1979); Bass (1995)
$Ca_2B_2Si_2O_8$ danburite	*M*	2.99	131	198	211	64.0	59.8	74.9	50	34	64	91.7	64.2	Hearmon (1979); Bass (1995)
Ca_2CO_3 aragonite	*M*	2.930	160	87.2	84.8	41.3	25.6	42.7	37.3	15.7	1.7	46.9	38.5	Hearmon (1979); Bass (1995)
Ca_2SO_4 anhydrite	*M*	2.963	93.8	185	112	32.5	26.5	9.3	16.5	31.7	15.2	54.9	29.3	Hearmon (1979); Bass (1995)
$(Fe,Mg)_2(Al,F^{3+})O_6SiO_4(O,OH)_2$ staurolite	*M*	3.79	343	185	147	46	70	92	67	128	61	128.2	57.5	Hearmon (1979); Bass (1995)
$Mg_{10}Si_3O_{14}(OH)_4$ super hydrous B	*M*	3.327	280	307	293	90	99.2	89.6	66	82	106	154	97	Pacalo & Weidner (1996)
$Na_2Al_2Si_3O_{10}\cdot 2H_2O$ natrolite	*M*	2.25	72.2	65.7	138	19.7	24.1	41.1	29.6	36.9	25.6	48.9	27.4	Hearmon (1984); Bass (1995)
Na_2SO_4 thenardite	*M*	2.663	80.4	105	67.4	14.8	18.0	23.6	29.8	16.8	25.6	43.4	22.3	Hearmon (1979); Bass (1995)
$Na_{0.047}(Mg_{0.840}Fe_{0.158})_2(Al_{3.83}Si_{5.17})O_{18}[0.25H_2O,0.31CO_2]$ cordierite	M	2.62	207.3	213.6	186.1	46.5	51.6	64.0	93.7	88.9	95.1	129	54.0	Toohill et al. (1999); minor Mn
Sr_2SO_4 celestite	*M*	3.972	104	106	129	13.5	27.9	26.6	77	62	60	81.8	21.5	Hearmon (1979); Bass (1995)

Tetragonal Crystals (4*mm*, 42*m*, 422, 4/*mmm*)

Material	Property	ρ	11	33	44	66	12	13	K	G	Source/Notes
Rutile Structure											
$BaTiO_3$	M	6.020							139	68	Fischer et al. (1993); polycrystal
(perovskite)	$\partial M/\partial P$	6.020							10.5	5.2	0-1.65 GPa
$Ca_2MgSi_2O_7$ akermite	M	2.946	159.4	149.4	30.26	58.1	76.53	57.80	94.4	40.7	Li et al. (1990); incommensurate phase
GeO_2	M	6.279	337.2	599.4	161.5	258.4	188.2	187.4	258.9	150.9	Wang & Simmons (1973)
	$\partial M/\partial P$	6.279	6.65	6.63	1.78	4.10	8.05	4.10	6.15	1.22	0-0.5 GPa
	$\partial M/\partial T$	6.279	-4.2	-3.8	-1.5	-3.8	-4.6	-2.3	-3.6	-1.2	293-373 K
SiO_2 stishovite	M	4.287							305	217	Li et al. (1996b); polycrystal
									5.3	1.8	0-3 GPa
	M	4.290	453	776	252	302	211	203	316	220	Weidner et al. (1982)
SiO_2 α-cristobalite	M	2.335	59.4	42.4	67.2	25.7	3.8	-4.4	16.4	39.1	Yeganeh-Haeri et al. (1992)
SnO_2 cassiterite	M	6.975	262	450	103.1	207.4	177	155.5	212.3	101.8	Chang & Graham (1975)
	$\partial M/\partial P$	6.975	5.3	6.1	0.89	3.2	6.8	4.7	5.1	0.61	0-1 GPa
	$\partial M/\partial T$	6.975	-2.0	-3.7	-0.59	-2.56	-2.1	-1.32	-1.9	-0.67	298-373 K
TeO_2 paratellurite	M	6.02	55.7	105.8	26.5	65.9	51.2	21.8	45.0	20.4	Peercy et al. (1975)
			5.3	13.4	-1.0	6.9	10.4				0-0.89 GPa
	M	5.99	53.2	108.5	24.4	55.2	48.6	21.2	43.7	19.0	Uchida & Ohmachi (1969)
TiO_2 rutile	M	4.24	268	484	123.8	190.2	175	147	212	113	Isaak et al. (1998)
	$\partial M/\partial T$	4.24	-4.2	-8.7	-1.87	-6.7	-4.8	-2.5	-4.0	-1.8	300-1800 K
	$\partial^2 M/\partial T^2$	4.24	4	15		21	10	8	8		
	M	4.249	267.4	479	123.3	189.4	180.8	146.6	213.1	111.1	Grimsditch & Ramdas (1976)
	M	4.25	270	482	124	193	177	148	214	113	Fritz (1974)
	$\partial M/\partial P$	4.25	6.3	8.1	1.08	5.9	9.0	5.6	6.91	0.61	0-2 GPa; *dG/dP & dK/dP* from Chung (1967)

	∂M/∂T	4.25	-5.4	-10.6	-2.1	-9.6	-6.1	-3.6			80-300 K
	M	4.260	271	484	124	195	178	150	215	114	Manghnani (1969), Manghnani et al. (1972)
	∂M/∂P	4.260	6.47	8.34	1.10	6.43	9.10	5.02	6.80	0.78	0-0.75 GPa
	∂M/∂T	4.260	-5.2	-9.0	-2.2	-7.8	-5.8	-3.2	-4.8	-2.1	4-583 K; deriv. analyzed in Isaak et al. (1998)
<u>Other</u>											
Ba_2TiO_8 fresnoite	*M*		140	83	33	59	36	24	56.9	42.1	Hearmon (1979); Bass (1995)
			166	100	31.7	69.4	58	44	77.6	43.3	C_{ij}^E (constant electric field)
$Ca_{10}Mg_2Al_4(SiO_4)_5(Si_2O_7)_2(OH)_4$ vesuvianite	*M*		153	166	55.8	54.0	48	44	82.6	55.5	Hearmon (1984); Bass (1995)
$(Na,Ca,K)_4Al_3(Al,Si)_3Si_6O_{24}(Cl,SO_4,CO_3)$ scapolite	*M*		99	113	15.6	22.9	35.1	35.4	58.0	23.1	Hearmon (1984); Bass (1995)
	M		102	140	23.0	30.4	38.9	43.3	65.3	29.1	
$PbTiO_3$ lead titanate	*M*	7.97	237	60	69	104	90	70			Kalinichev et al. (1997); set A minimization
			237	90	69	104	90	100			set B minimization; all C_{ij}^E (constant electric field)
			235	105	65	104	101	99			Li et al. (1993); C_{ij}^E (constant electric field)
$ZrSiO_4$ nonmetamict zircon	*M*	4.675	424	489	113	48.3	69	149	228	109	Özkan et al. (1978); average of 2 specimens
	∂M/∂P	4.675	10.8	5.88	0.994	-0.305	3.24	6.20	6.50	0.78	0-1.2 GPa
	∂M/∂T	4.675	-4.51	-4.34	-0.91	-0.23	-0.54	-1.02	-2.1	-0.94	298-573 K
$ZrSiO_4$ zircon	*M*	4.70	256	372	73.5	116	175	214	223.9	66.6	Hearmon (1984); Bass (1995)

Tetragonal Crystals (4, 4, 4/*m*)

Material	Property	ρ	11	33	44	66	12	13	16	K	G	Source/Notes
Majorite Garnet												
$MgSiO_3$ enstatite	*M*	3.522	286	280	85.0	93	83	105	1.4	160	90	Pacalo & Weidner (1998)
	M	3.525								165	88	Gwanmesia et al (1997); ave. of 3 polycrystals
	$\partial M/\partial P$	3.525								6.7	1.9	0-8 GPa
	M	3.555								166	88	Sinogeikin et al. (1997a); polycrystal
Other												
$CaMoO_4$ powellite	*M*	4.255	144	127	36.8	45.8	65	47	-13.6	81.0	39.9	Hearmon (1979); Bass (1995)
$CaWO_4$ scheelite	*M*	6.119	141	125	33.7	40.7	61	41	-17	76.5	37.4	Hearmon (1979); Bass (1995)
$PbMoO_4$ wulfenite	*M*	6.816	109	92	26.7	33.7	68	53	-13.6	72.4	24.5	Hearmon (1979); Bass (1995)
		6.816	108	95	26.4	35.4	63	51	-15.8	70.8	25.0	

Trigonal Crystals (32, 3*m*, 3*m*)

Material	Property	ρ	11	33	44	12	13	14	K	G	Source/Notes
Corundum Structure											
Al_2O_3 corundum	M									163.8	Zhang & Chopelas (1994)
	$\partial M/\partial P$									1.782	0-62 GPa
	$\partial^2 M/\partial P^2$									-1.04	
	M	3.982	497	501	146.8	163	116	-21.9	254	163	Goto et al. (1989)
	$\partial M/\partial T$	3.982	-3.5	-3.5	-2.46	+0.15	-0.83	-0.59	-1.5	-2.1	296-1825 K; derivative at 296 K
	$\partial M/\partial T$	3.982	-4.9	-4.8	-2.69	-0.48	-1.3	-0.16	-2.3	-2.4	derivative at 1000 K
	$\partial M/\partial T$	3.982	-5.0	-4.4	-2.51	-0.42	-0.52	+0.08	-1.9	-2.4	derivative at 1825 K
	M		497.6	501.9	147.2	162.6	117.2	-22.9	254.2		Gieske & Barsch (1968)
	$\partial M/\partial P$		6.17	5.00	2.24	1.45	3.65	0.13	4.32		0-1 GPa
Cr_2O_3 eskolaite	M		374	362	159	148	175	-19	234	123	Alberts & Boeyens (1976); K_S and G from Bass (1995)
Fe_2O_3 hematite	M	5.254							206.6	91.0	Liebermann & Schreiber (1968); polycrystal
									4.5	0.73	0-0.3 GPa
Ti_2O_3	M	4.58	330	297	107	132	163	-2.4			Rimai et al. (1978,1979)
	$\partial M/\partial P$	4.58	5.7	6.0	1.1	5.0	2.5	-0.4			0-0.4 GPa
	$\partial M/\partial T$	4.58	-4.92	-5.61	-2.15	-2.67	-0.098				
Other											
$AlPO_4$ α-berlinite	M		69.8	87.1	42.2	10.6	14.9	13.4	33.9	32.7	Ecolivet & Poignant (1981); no density given; C^D_{ij} constants stiffened by piezoelectric effect; K_S and G from Bass (1995)
	M	2.620	64.0	85.8	43.2	7.2	9.6	-12.4			Chang & Barsch (1976); C^E_{ij} (constant electric field); 80-298 K; $\partial K_S/\partial T$ and $\partial G/\partial T$ from Bass (1995)
	$\partial M/\partial T$	2.620	-0.49	-1.87	-0.68	-1.07	-0.38	-0.089	-0.7	-0.2	
BaB_2O_4 barium borate	M	3.840	123.8	53.3	7.8	60.3	49.4	12.3			Eimerl et al. (1987)

	$\partial M/\partial T$	3.840	-2.83	-2.06	-1.36	-0.90	-1.11	-0.77			298-323 K
$CaCO_3$ calcite	*M*	2.712	144	84.3	33.5	54.2	51.2	-20.5			Every & McCurdy (1992)
	M	2.712	144	84.0	33.5	53.9	51.1	-20.5	73.3	32.0	Hearmon (1984); Bass (1995)
	M	2.712	145	85.6	32.9	55.0	52.8	-20.3	71.6		Kaga (1968)
	$\partial M/\partial P$	2.712	3.02	2.80	0.92	2.05	3.19	-1.25	4.83		0-0.010 GPa; $\partial K/\partial P$ is isothermal *K*
	$\partial M/\partial T$	2.712	-5.65	-1.25	-0.96	-2.90	-2.55	+0.58			273-275 K; derivative at 273 K
$CoCO_3$ cobalt carbonate	*M*		271	163	52	119	87	5			Every & McCurdy (1992)
	M	2.620	64.0	85.8	43.2	7.2	9.6	-12.4	254	163	Chang & Barsch (1976); zero-field C^E_{ij}; K_S and
	$\partial M/\partial T$	2.620	-0.49	-1.87	-0.68	-1.07	-0.38	-0.089	-7	-2	*G* from Bass (1995); 80-298 K
$FeBO_3$ iron borate	*M*	4.28	445	305	95	145	140	20			Jantz et al. (1976)
$MgCO_3$ magnesite	*M*		258.7	155.5	54.8	75.5	58.8	-19.05	114	68	Every & McCurdy (1992); Bass (1995)
$MnCO_3$ manganese carb.	*M*		216	126	44	141	74	22			Every & McCurdy (1992)
$NaNO_3$ nitratine	*M*	2.260	54.6	34.9	11.3	18.9	19.3	7.5	28.2	12.0	Hearmon (1979); Bass (1995)
$Na(Mn,Fe,Li,Al)B_3Al_6Si_6O_{27}(OH,F)_4$ tourmaline	*M*	3.100	305.0	176.4	64.8	108	51	-6	127	81.5	Özkan (1979)
tourmaline	*M*	3.108	305.2	176.4	64.6	98.4	51	-6	126.0	81.7	Tätli & Özkan (1987); Specimen 1
	M	3.105	295.8	173.3	63.6	96.3	45	-10	121.3	79.8	Tätli & Özkan (1987); Specimen 2
	M	3.046	300.0	173.8	65.2	96.9	42	-7	121.1	81.6	Tätli & Özkan (1987); Specimen 3
	M	3.051	301.1	174.6	65.4	97.3	43	-7	121.7	81.9	Tätli & Özkan (1987); Specimen 4
	M	3.061	301.6	169.8	65.5	102.8	47	-9	122.6	82.6	Tätli & Özkan (1987); Specimen 5
SiO_2 α-quartz	*M*	2.641	87.7	106.3	59.0	6.8	12.3	+18.7	38.0	44.8	Ohno (1995)
	$\partial M/\partial T$	2.641	-0.64	-2.99	-1.42	-2.42	-1.12	+0.09	-1.48	-0.28	linear fit of data from 296-567 K
	M	2.641	88.1	104.7	58.6	7.6	12.1	-18.3			Ohno (1990); from elastic theory;
	M	2.641	87.6	104.8	58.4	8.1	12.0	-18.1			from piezoelectric theory
	M	2.648	86.6	106.1	57.8	6.7	12.6	-17.8	37.8	44.3	Hearmon (1979); Bass (1995)

M	2.648	86.74	107.2	57.9	6.98	11.9	-17.9	37.8	44.4	C^{E}_{ij} (constant electric field)
M	2.648	86.6	106.1	57.8	6.7	12.6	-17.8	37.8	44.3	C^{D}_{ij} (constant electric displacement)
M	2.649	86.80	105.8	58.20	7.04	11.91	-18.04	37.41		McSkimin et al. (1965); C^{E}_{ij} (constant electric field); 0-0.2 GPa
$\partial M/\partial P$	2.649	3.28	10.84	2.66	8.66	5.97	1.93	6.3		

Trigonal Crystals (3, 3)

Material	Property	ρ	11	33	44	12	13	14	15	K	G	Source/Notes
Be_2SiO_4 phenacite	*M*	2.960	341.9	391.0	91.4	148.0	136.0	0.1	3.5	212.8	98.9	Yeganeh-Haeri & Weidner (1989)
$CaMg(CO_3)_3$ dolomite	*M*	3.795	205	113	39.8	71.0	57.4	-19.5	13.7	94.9	45.7	Every & McCurdy (1992); Bass (1995)
$MgSiO_3$ ilmenite	*M*	3.795	472	382	106	168	70	-27	24	212	132	Weidner & Ito (1985)

Hexagonal Crystals

Material	Property	ρ	11	33	44	12	13	K	G	Source/Notes
BeO bromellite	*M*	3.010	460.6	491.6	147.7	126.5	88.5	224		Cline et al. (1970)
	M	3.01	470	494	153	168	119	251	162	Bentle (1966)
$Be_3Al_2Si_6O_{18}$ beryl	*M*	2.698	308.5	283.4	66.1	128.9	118.5	181	79.2	Yoon & Newnham (1973); aquamarine spec.
	$\partial M/\partial P$	2.698	4.47	3.43	-0.18	3.96	3.78	3.90	0.0074	0-0.1 GPa; *dG/dP* calc. from Chung (1967)
	M	2.724	304.2	277.6	65.3	123.8	114.5	176	78.8	Yoon & Newnham (1973); goshenite spec.
β-SiO_2	*M*		117	110	36	16	33	56.4	41.4	Hearmon (1984); Bass (1995); at 873 K
C carbon (pyrolytic graphite)	*M*	2.26	1060	36	0.3	180	15	161	109	Blakslee et al. (1970); Bass (1995)
$Ca_{10}(PO_4)_6(OH)_2$ hydroxyapatite	*M*	3.146	140	180	36.2	13	69	80.4	45.6	Hearmon (1984); Bass (1995)
$Ca_{10}(PO_4)_6F_2$ flourapatite	*M*	3.200	141	177	44.3	46	56	212.3	101.8	Hearmon (1984); Bass (1995)
CdSe	*M*	5.684	749.0	845.1	131.5	460.9	392.6	53.7		Cline et al. (1970)
CdS greenockite	*M*	4.824	86.5	94.4	15.0	54.0	47.3	62.7	16.9	Hearmon (1984); Bass (1995)
										Kobiakov (1980); Bass (1995)
	M		83.1	94.8	15.33	50.4	46.2	60.7	17.1	C^E_{ij} (constant electric field)
	M		83.8	96.53	15.77	51.1	45.0	60.7	17.5	C^D_{ij} (constant electric displacement)
	$\partial M/\partial T$			-0.155	-0.090					180-300 K where C_{ij} vrs *T* are linear (Other $C_{ij}(T)$ data not provided)
$K(Mg,Fe)_3AlSi_3O_{10}(OH,F)_2$ biotite	*M*		186	54	5.8	32	12			Every & McCurdy (1992)
$Na_3KAl_4Si_4O_{16}$ nepheline	*M*	2.571	79	125	37.2	38	21	48.9	30.7	Hearmon (1984); Bass (1995)

	M	2.571	80	119	41	31	27	49		Bonczar & Barsch (1975)
	$\partial M/\partial T$	2.571	3.7	-1.5	-0.49	-2.6	-1.3	-0.5 to 0.1	1.6	298-353 K; range in $\partial K/\partial T$ from Bonzcar & Barsch; $\partial G/\partial T$ from Bass (1995)
ZnO zincite	M	5.675	209	218	44.1	120	104	143.5	46.8	Hearmon (1984); Bass (1995)
										Kobiakov (1980); Bass (1995)
	M		207	209.5	44.8	117.7	106.1	142.6	46.3	C^E_{ij} (constant electric field)
	M		209.6	221	46.1	120.4	101.3	142.9	48.2	C^D_{ij} (constant electric displacement)
	$\partial M/\partial T$			-0.123	-0.069					~300-500 K where C_{ij} vrs T are linear; (Other C_{ij} (T) data not provided)
ZnS wurtzite	M	4.084	122	138	28.7	58	42	74.0	33.3	Hearmon (1979); Bass (1995)
	M	4.084	123.4	139.6	28.85	58.5	45.5	76.2		E. Chang & Barsch (1973)
	$\partial M/\partial P$	4.084	4.3	5.1	-0.085	4.6	4.15	4.37	-0.037	0-0.1GPa; *dG/dP* calc. from Chung (1967)
	$\partial^2 M/\partial P^2$	4.084			-5.8	14.4				
	$\partial M/\partial T$	4.084	-1.412	-1.53	-0.276	-0.776	-0.674	-0.956		298-373 K
	M	4.091	122.2	138.5	28.23	59.1	46.0			Uchita & Saito (1972)
	M	4.089	124.2	140.0	28.64	60.15	45.54	76.7		Cline et al. (1970)

Cubic Crystals

Material	Property	ρ	11	44	12	K	G	Source/Notes
Garnet								
$Ca_3Cr_2Si_3O_{12}$ uvarovite	*M*	3.850	304	84	91	162	92	Bass (1986)
$Ca_3Al_2(SiO_4)_{1.72}(H_4O_4)_{1.28}$ hibschite (hydrous grossular)	*M*	3.13	187	63.9	57	100	64.3	O'Neill et al. (1993)
$Ca_3(Fe_{1.92}Al_{0.08})Si_3O_{12}$ andradite	*M*	3.836	289	85	92	157	90	Bass (1986)
$(Ca_{0.99}Mg_{0.01})_3Al_2Si_3O_{12}$ grossular	*M*	3.597	318.8	102.9	92.1	167.8	107.0	Isaak et al. (1992); ~1% andradite
	$\partial M/\partial T$	3.597	-3.61	-1.02	-0.33	-1.49	-1.25	300-1350 K
	$\partial^2 M/\partial T^2$	3.597	-3.8	-2.0	0.0	0.0	-2.1	
$(Ca_{0.98}Mg_{0.02})_3Al_2Si_3O_{12}$ grossular	$\partial M/\partial P$	3.60				5.46	1.1	Conrad et al. (1999); 0-10 GPa
$Ca_3(Al_{0.99}Fe_{0.01})_2Si_3O_{12}$ grossular	*M*	3.602	3217	104.6	91.4	168.4	108.9	Bass (1989)
$(Ca_{0.94}Fe_{0.03}Mg_{0.02}Mn_{0.01})_3(Al_{0.86}Fe^{3+}_{0.14})_2Si_3O_{12}$ grossular-andradite	*M*	3.659	306.1	98.8	88.7	161.2	102.6	Babuska et al. (1978); minor Ti present; specimen GR-1
$Ca_3(Fe^{3+}_{0.91}Al_{0.09})Si_3O_{12}$ andradite	$\partial M/\partial P$	3.84				5.85	4.3	Conrad et al. (1999); 0-9.56 GPa
$(Ca_{0.93}Fe_{0.04}Mg_{0.03})_3(Fe^{3+}_{0.71}Al_{0.29})_2Si_3O_{12}$ andradite-grossular	*M*	3.775	281.2	87.9	80.4	147.3	92.7	Babuska et al. (1978); minor Ti present; specimen AN-1
$(Ca_{0.85}Fe_{0.08}Mn_{0.07})_3Al_2Si_3O_{12}$ grossular	*M*	3.62	317.7	101.1	98.3	171.4	104.5	Halleck (1973)
	$\partial M/\partial P$	3.62	5.10	0.52	3.83	4.25	0.56	*dG/dP* calculated from Chung (1967)
$(Ca_{0.49}Mg_{0.28}Fe_{0.23})_3Al_2Si_3O_{12}$ grossular-pyrope-almandine	*M*	3.741	310.2	99.5	100.4	170.4	101.6	O'Neill et al. (1989); minor Mn^{2+}, Fe^{+3}, Ti^{+3} present
$(Fe_{0.81}Mg_{0.14}Ca_{0.04}Mn_{0.01})_3Al_2Si_3O_{12}$								

almandine-pyrope	*M*	4.183	304.8	94.4	112.3	176.5	95.1	Verma (1960)
$(Fe_{0.76}Mg_{0.21}Ca_{0.03})_3Al_2Si_3O_{12}$	*M*	4.1602	306.2	92.7	112.5	177.1	94.3	Soga (1967)
almandine-pyrope	$\partial M/\partial P$	4.1602	7.48	1.31	4.41	5.43	1.40	0-0.28 GPa
	$\partial M/\partial T$	4.1602	-3.48	-1.04	-1.28	-2.01	-1.06	288-313 K
$(Fe_{0.64}Mg_{0.22}Mn_{0.11}Ca_{0.03})_3(Al_{0.97}Fe^{3+}_{0.03})_2Si_3O_{12}$								
almandine-pyrope-spessartine	*M*	4.131	306.7	94.9	111.9	176.8	95.9	Babuska et al. (1978); specimen AL-3
$(Fe_{0.60}Mg_{0.28}Mn_{0.09}Ca_{0.03})_3(Al_{0.97}Fe^{3+}_{0.03})_2Si_3O_{12}$								
almandine-pyrope	*M*	4.043	305.5	95.3	110.3	175.4	96.2	Babuska et al. (1978); specimen AL-5
$(Fe_{0.54}Mg_{0.39}Ca_{0.06}Mn_{0.01})_3(Al_{0.99}Fe^{3+}_{0.01})_2Si_3O_{12}$								
almandine-pyrope	*M*	3.976	302.7	94.7	109.1	173.6	95.6	Babuska et al. (1978); specimen AL-Y
	M	3.705	302.5	94.7	109.0	173.5	95.5	Sumino & Nishizawa (1978); same specimen as AL-Y in
	$\partial M/\partial T$		-4.02	-0.94	-1.40	-2.27	-1.09	Babuska et al. (1978); aver. $\partial M/\partial T$ between 223-323 K
$(Fe_{0.52}Mn_{0.46}Ca_{0.01})_3Al_2Si_3O_{12}$	*M*	4.2396	306.5	94.36	111.3	176.3	95.6	Isaak and Graham (1976)
almandine-spessartine	$\partial M/\partial P$	4.2396	6.69	1.26	3.54	4.59	1.38	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	4.2396	-3.33	-0.87	-0.91	-1.72		298-473 K
	$\partial^2 M/\partial P \partial T$	4.2396	2.7	1.19	0.0	0.9		0-0.5 GPa, 298-473 K
$(Fe_{0.51}Mg_{0.39}Ca_{0.09}Mn_{0.01})_3(Al_{0.99}Fe^{3+}_{0.01})_2Si_3O_{12}$								
almandine-pyrope	*M*	3.945	302.7	95.1	108.7	173.4	95.9	Babuska et al. (1978); specimen AL-X
$(Fe_{0.48}Mg_{0.41}Ca_{0.10}Mn_{0.01})_3(Al_{0.99}Fe^{3+}_{0.01})_2Si_3O_{12}$								
almandine-pyrope-grossular	*M*	3.930	303.6	94.9	110.6	174.9	95.5	Babuska et al. (1978); specimen AL-4
$Mg_{3.03}Al_{1.97}Si_{2.99}O_{12}$ pyrope	*M*	3.567	296.2	91.6	111.1	172.8	92.0	O'Neill et al. (1991); synthetic specimen
$Mg_3Al_2Si_3O_{12}$ pyrope	*M*	3.57				171	92	Chen et al. (1999); polycrystal, synthetic specimen
	$\partial M/\partial P$	3.57				5.3	1.6	0-10 GPa
	M	3.5637	295	90	117	177	90	Leitner et al. (1992); synthetic specimen
$(Mg_{0.97}Fe_{0.02}Ca_{0.01})_3Al_2Si_3O_{12}$	$\partial M/\partial P$	3.582				3.22	1.4	Conrad et al. (1999); 0-8.75 GPa
$(Mg_{0.90}Fe_{0.08}Ca_{0.02})_3Al_2Si_3O_{12}$	*M*	3.609	297.6	92.7	109.8	172.4	93.2	O'Neill et al. (1991)

$(Mg_{0.73}Fe_{0.16}Ca_{0.10}Mn_{0.01})_3(Al_{0.91}Cr_{0.05}Fe^{3+}_{0.04})_2Si_3O_{12}$								
pyrope-almandine-grossular	*M*	3.704	295.6	91.6	107.2	170.0	92.6	Babuska et al. (1978); minor Ti present; specimen PY-0
$(Mg_{0.73}Fe_{0.16}Ca_{0.11}Mn_{0.01})_3(Al_{0.90}Cr_{0.06}Fe^{3+}_{0.04})_2Si_3O_{12}$								
pyrope-almandine-grossular	$\partial M/\partial T$	3.705	-3.60	-0.80	-1.11	-1.94	-0.93	Suzuki & Anderson (1983); minor Ti present;
	$\partial^2 M/\partial T^2$	3.705		-1.9			-2.3	300-1000 K; derivs. determined by Isaak et al. (1992)
	M	3.705	296.9	91.7	108.5	171.3	92.6	Babuska et al. (1978); specimen PY-1; same specimen as Suzuki & Anderson (1983)
	M	3.705	296.6	91.7	108.4	171.2	92.7	Sumino & Nishizawa (1978); same specimen as
	$\partial M/\partial T$	3.705	-3.68	-0.74	-1.54	-2.25	-0.87	Suzuki & Anderson (1983); average derivative between 223-323 K
$(Mg_{0.73}Fe_{0.14}Ca_{0.12}Mn_{0.01})_3(Al_{0.88}Cr_{0.09}Fe^{3+}_{0.03})_2Si_3O_{12}$								
pyrope-almandine	*M*	3.699	297.5	90.7	108.7	171.6	92.1	Babuska et al. (1978); minor Ti present; specimen PY-2
$(Mg_{0.70}Fe_{0.16}Ca_{0.13}Mn_{0.01})_3(Al_{0.89}Cr_{0.09}Fe^{3+}_{0.02})_2Si_3O_{12}$								
pyrope-almandine-grossular	*M*	3.723	296.0	90.8	108.2	170.8	92.0	Babuska et al. (1978); specimen PY-A
$(Mg_{0.62}Fe_{0.36}Ca_{0.02})_3Al_2Si_3O_{12}$	*M*	3.839	301.4	94.3	110.0	173.6	94.9	Webb (1989)
pyrope-almandine	$\partial M/\partial P$	3.839	7.04	1.54	3.88	4.93	1.56	0-3 GPa; *dG/dP* calculated from Chung (1967)
	M	3.839	301.1	94.4	109.4	173.3	95.0	Bonczar et al. (1977) with corrections due to reanalysis
	$\partial M/\partial P$	3.839	7.0	1.5	3.8	4.9	1.54	of density by Webb (1989); 0-1 GPa; *dG/dP* calculated
	$\partial M/\partial T$	3.839	-3.29	-0.75	-1.18	-1.88		from Chung (1967)
$(Mg_{0.51}Fe_{0.32}Ca_{0.16}Mn_{0.01})_3(Al_{0.98}Fe^{3+}_{0.02})_2(Si_{0.99}Ti_{0.01})_3O_{12}$								
pyrope-almandine-grossular	M	3.180	299	93.7	107	171	94.7	Chai et al. (1997a)
	$\partial M/\partial P$	3.180	6.54	1.72	2.87	4.09	1.76	0-20 GPa
$(Mg_{0.50}Fe_{0.46}Ca_{0.03}Mn_{0.01})_3(Al_{0.99}Fe^{3+}_{0.01})_2Si_3O_{12}$								
pyrope-almandine	*M*	3.916	301.7	95.0	109.7	173.7	95.4	Babuska et al. (1978); specimen AL-6
	M	3.705	301.5	95.0	109.6	173.6	95.3	Sumino & Nishizawa (1978); same specimen as AL-6 in
	$\partial M/\partial T$	3.705	-3.88	-0.97	-1.46	-2.27	-1.07	Babuska et al. (1978); aver. $\partial M/\partial T$ between 223-323 K
$Mn_3Al_2Si_3O_{12}$ spessartine	*M*	4.185	299.0	92.0	108.2	171.8	93.3	Babuska et al. (1978); specimen SP-2

$(Mn_{0.95}Fe_{0.05})_3Al_2Si_3O_{12}$								
spessartine	*M*	4.195	309.5	95.2	113.5	178.8	96.3	Bass (1989)
$(Mn_{0.75}Fe_{0.18}Ca_{0.05}Mg_{0.02})_3$ $Al_2Si_3O_{12}$								
spessartine-almandine	*M*	4.172	305.5	96.2	111.9	176.4	96.5	Babuska et al. (1978); specimen SP-1
$(Mn_{0.55}Fe_{0.44}Ca_{0.01})_3Al_2Si_3O_{12}$								
spessartine-almandine	*M*	4.247	307.3	95.2	109.7	175.6	96.2	Verma (1960)
$(Mn_{0.54}Fe_{0.46})_3Al_2Si_3O_{12}$	*M*	4.249	308.5	94.8	112.3	177.7	96.1	Wang & Simmons (1974)
spessartine-almandine	*∂M/∂P*	4.249	7.15	1.29	3.85	4.95	1.44	0-0.5 GPa
Garnet (Majorite) (Abbreviations: en - enstatite ($Mg_4Si_4O_{12}$); py - pyrope ($Mg_3Al_2Si_3O_{12}$))								
$en_{80}py_{20}$	*M*	3.556				166	88	Sinogeikin et al. (1997a); polycrystal
$en_{66}py_{34}$	*M*	3.527				172	92	Yeganeh-Haeri et al. (1990); polycrystal
$en_{50}py_{50}$	*M*	3.567				173	92.3	Sinogeikin et al. (1997a); polycrystal
$en_{50}py_{50}$	*M*	3.530				170	989	Liu et al. (2000); polycrystal
	∂M/∂P	3.530				6.4	2.1	0-8.1 GPa
$en_{41}py_{59}$	*M*	3.555				164	89	Bass & Kanzaki (1990); single-crystal data not reported
$en_{39}py_{61}$	*M*	3.456				169	89	Rigden et al. (1994); polycrystal
	∂M/∂P	3.456				5.3	2.0	0-3 GPa
$en_{38}py_{62}$	*M*	3.533				171	90	Liu et al. (2000); polycrystal
	∂M/∂P	3.533				6.2	1.9	0-8.9 GPa
$en_{33}py_{67}$	*M*	3.545				170	92	Yeganeh-Haeri et al. (1990); polycrystal
$(Mg_{0.78}Fe_{0.21}Ca_{0.01})SiO_3$	*M*	3.727				1.63		Kavner et al. (2000)
	∂M/∂P	3.727				6.6		0-3 GPa
$(Mg_{0.75}Fe_{0.21}Ca_{0.01})SiO_3$	*M*	3.727				164	87	Sinogeikin et al. (1997b); polycrystal

$(Na_{0.62}Mg_{0.39})_3(Si_{0.97}Mg_{0.03})_2Si_3O_{12}$								
Na-rich majorite	*M*	3.606	329	114	96	174	115	Pacalo et al. (1992)

Oxide (binary) - Periclase

MgO	$\partial^2 M/\partial P\partial T$		-1.3	-0.2		3		Chen et al. (1998); 0-8GPa; 300-1600 K
	M	3.584	297.8	155.8	95.1	162.7	131.2	Yoneda (1990)
	$\partial M/\partial P$	3.584	8.76	1.31	1.81	4.13	1.95	0-7.78 GPa
	$\partial^2 M/\partial P^2$	3.584	-3	-9	+2	-0.1		
	M	3.585	299.0	157.1	96.4	163.9	131.8	Isaak et al. (1989a)
	$\partial M/\partial T$	3.585	-5.85	-1.22	-0.75	-1.45	-2.4	300-1800 K
	M	3.584	296.6	156.2	95.9	162.8	130.9	Sumino et al. (1983)
	$\partial M/\partial T$	3.584	-5.96	-1.22	-0.68	-1.53	-2.35	80-1300 K; derivatives at 300 K
	M	3.584	296.8	155.8	95.3	162.5	130.8	Jackson and Niesler (1982)
	$\partial M/\partial P$	3.584	9.17	1.11	1.61	4.13	2.53	0-3 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	3.584	-11.8	-3.2	-2.8	-5.8		Incorrectly given as $(1/2)(\partial^2 M/\partial P^2)$ in ref.
	M	3.584	297.8	156.3	97.0	163.9	130.9	Sumino et al. (1976)
	M	3.583	297.4	156.2	95.6	162.8	131.1	Spetzler (1970)
	$\partial M/\partial P$	3.583	8.7	1.09	1.42	3.85	1.78	0-0.8 GPa
	$\partial M/\partial T$	3.583	-6.06	-1.03	+0.74	-1.53		300-800 K
	M	3.579	296.6	155.8	95.1	162.3	130.8	Chang and Barsch (1969)
	$\partial M/\partial P$	3.579	9.16	1.12	1.82	4.27	2.47	0-3 GPa; *dG/dP* calculated from Chung (1967)
	M	3.583	296.5	155.9	95.1	162.2	130.9	Anderson & Andreatch (1966)
	$\partial M/\partial P$	3.583	9.48	1.16	1.99	4.49	2.54	0-0.2 GPa; *dG/dP* calculated from Chung (1967)

Oxide (binary) - Wüstite

$Fe_{0.943}O$	*M*	5.708	221	45.6	126	158	46.5	Isaak & Carnes (1994)
	M	5.708	218.4	45.5	123.0	154.8	46.4	Jackson et al. (1990)
	$\partial M/\partial P$	5.708	9.65	-1.03	2.77	5.06	0.71	0-3 GPa

	$\partial^2 M/\partial P^2$	5.708	-42	-2.8	+1.6	-13.0	-19.4	
$Fe_{0.950}O$	*M*	5.730	217	46	121	153	46.8	Berger et al. (1981)
$Fe_{0.92}O$	*M*	5.681	245.7	44.7	149.3	181.4	46.1	Sumino et al (1980)
	$\partial M/\partial T$	5.681	-4.2	+3.15	-0.8	-2.0	+1.24	179-303 K

Oxides (other binary)

BaO	*M*	5.992	126.1	33.7	50.0	75.4	35.4	Chang & Graham (1977)
	$\partial M/\partial P$	5.992	10.18	-0.472	3.19	5.52	1.00	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	5.992	-5.38	-0.50	-0.90	-2.39		281-298 K
	M	5.992	112	34	36	61	35.5	Vetters & Bartels (1973)
	$\partial M/\partial T$	5.992	-3.2	-1.6	+0.56	-0.7		195-296 K
CaO	*M*	3.3493	220.56	80.06	57.64	111.95	80.62	Oda et al. (1992)
	$\partial M/\partial T$	3.3493	-4.92	-0.7	+0.35	-1.41	-1.47	300-1200 K
	$\partial^2 M/\partial T^2$	3.3493	+4.7	-0.9	-4.5	-1.4	+0.3	
	M	3.346	221.9	80.3	57.8	112.5	81.0	Chang & Graham (1977)
	$\partial M/\partial P$	3.346	10.36	0.196	2.07	4.83	1.76	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	3.346	-4.89	-0.68	+0.52	-1.28		281-298 K
	M	3.346	223	81	59	114	81.4	Son & Bartels (1972)
	$\partial M/\partial P$	3.346	10.3	0.6	3.9	6.0	1.6	0-0.2 GPa; *dG/dP* calculated from Chung (1967)
CoO	*M*	6.442	262.4	83.6	147.2	185.6	72.0	Sumino et al. (1980)
	$\partial M/\partial T$	6.442	+30	+3.0	-12	+2	+11.2	288-303 K; derivatives have large error bars
	M	6.394	256	80.3	144	181	69.6	Uchida & Saito (1972)
	M	6.44	261.7	83.2	145	184	72.3	Aleksandrov et al. (1968); data from 243-303 K but derivatives irregular because of magnetic phase change
MnO manganosite	M	5.343	230.4	79.9	117.5	155.1	69.6	Pacalo & Graham (1991)
	$\partial M/\partial P$	5.343	8.54	-0.019	2.78	4.70	1.41	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	5.343		-9.8				

	$\partial M/\partial T$	5.343	-6.20	+0.234	+0.05	-2.04		273-473 K
	$\partial^2 M/\partial T^2$	5.343		-1.04				
	M	5.346	226.4	79.0	114.9	152.1	68.8	Webb et al. (1988)
	$\partial M/\partial P$	5.346	9.26	0.17	3.30	5.28	1.55	0-3 GPa
	M	5.372	233.0	79.4	121.5	158.6	68.9	Sumino et al. (1980)
	$\partial M/\partial T$	5.372	-6.33	+0.25	-0.05	-2.14	-1.46	123-303 K
	M	5.365	222	78.3	110	147	68.5	Uchida & Saito (1972)
NiO	*M*	6.828	345	40	141	205	58.8	Wang et al. (1991)
	M	6.790	270	105	125	173	90.6	Uchida & Saito (1972)
SrO	*M*	5.009	175.5	55.9	49.1	91.2	58.7	Chang & Graham (1977)
	$\partial M/\partial P$	5.009	11.0	-0.21	2.3	5.18	1.49	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	5.009	-4.71	-0.63	-0.31	-1.8		281-298 K
	M	5.009	173	56	45	88	59	Son & Bartels (1972)
	$\partial M/\partial P$	5.009	11.3	-0.2	3.3	6.0	1.4	0-0.2 GPa; *dG/dP* calculated from Chung (1967)
UO_2	*M*	10.97	389.3	59.7	118.7	208.9	83.2	Fritz (1976)
	$\partial M/\partial P$	10.97	5.4	1.62	4.35	4.7	1.42	0-2 GPa
	$\partial M/\partial T$		-5.2	-1.1	-2.3	-3.3		Brandt & Walker (1968); 4-300 K; cited by Fritz (1976)
<u>Spinel Structures</u>								
Co_2GeO_4	*M*	5.81				192	77	Rigden & Jackson (1991); polycrystal
	$\partial M/\partial P$	5.81				5.59	0.57	0-3 GPa
$FeAl_2O_4$ hercynite	*M*	4.280	266.0	133.5	182.5	210.3	84.4	Wang & Simmons (1972)
Fe_2GeO_4	*M*	5.46				196	76	Rigden & Jackson (1991); polycrystal
	$\partial M/\partial P$	5.46				4.86	0.45	0-3 GPa
Fe_2SiO_4	*M*	4.68				201	79	Rigden & Jackson (1991); polycrystal
	$\partial M/\partial P$	4.68				5.59	1.06	0-3 GPa

Fe_2TiO_4 ulvöspinel	*M*	4.836	139.0	39.6	112.0	121.0	26.1	Syono et al. (1971)
Fe_3O_4 magnetite	*M*	5.206	275	95.5	104	161	91.4	Hearmon (1984)
	M		270	98.7	108	162	91.2	Hearmon (1984)
	M	5.163	267.6	95.3	105.6	159.6	89.3	England (1970)
$FeCr_2O_4$ chromite	*M*	5.09	322	117	144	203	105	Hearmon (1984)
$MgAl_2O_4$ spinel	*M*	3.5846	281.31	154.59	155.44	197.39	107.8	Suzuki et al. (2000); synthetic specimen
	$\partial M/\partial T$	3.5846	-2.23	-0.92	-0.65	-1.44	-0.81	293-1167 K; second order polynomial fits applied to
	$\partial^2 M/\partial T^2$	3.5846	-29	-14	-14	-31	-17.3	data up to 760 K to get derivatives
	M	3.574	292.5	156.6	168.9	210.1	108.3	Cynn et al. (1993); natural specimen
	$\partial M/\partial T$	3.574	-3.79	-1.50	-2.12	-1.54	-1.21	298-1003 K
	M	3.578	286	153	157	200	109	Askarpour et al. (1993)
	$\partial M/\partial T$	3.578	-3.25	-1.41	-1.21	-1.89		300-923 K
	$\partial M/\partial T$	3.578	-2.32	-1.14	-1.29	-1.64		923-1273 K
	M	3.578	282.9	154.8	155.4	197.9	108.5	Yoneda (1990)
	$\partial M/\partial P$	3.578	5.59	1.44	5.69	5.66	0.36	0-6.16 GPa; $\partial G/\partial P$ is ave. of range in reference
	$\partial^2 M/\partial P^2$	3.578	-65	-19	-64	-65		
	M	3.578	282.5	154.7	154.9	197.4	108.8	Z. Chang and Barsch (1973)
	$\partial M/\partial P$	3.578	5.15	0.89	4.76	4.89	0.51	0-1 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	3.578	-52	-2.9	-46	-48		
	$\partial M/\partial T$	3.578	-2.62	-0.88	-1.00	-1.54		288-308 K
	M	3.581	279.0	153.0	153.0	195	107.5	Lewis (1966)
$MgO{:}3.5Al_2O_3$	*M*	3.630	300.5	158.5	153.7	202.6	116.6	Verma (1960)
$MgO{:}3.0Al_2O_3$	*M*	3.624	299.0	158.0	154.4	202.6	115.7	England (1970)
	$\partial M/\partial P$	3.624	5.35	0.89	4.21	4.59	0.75	*dG/dP* calculated from Chung (1967)
$MgO{:}2.6Al_2O_3$	*M*	3.619	298.6	157.6	153.7	202.0	115.7	Schreiber (1967)

	∂M/∂P	3.619	4.90	0.85	3.90	4.23	0.69	0-0.2 GPa; *dG/dP* calculated from Chung (1967)
$Mg_{0.75}Fe_{0.36}Al_{1.9}O_4$	*M*	3.826	269.5	143.5	163.3	198.7	97	Wang & Simmons (1972)
pleonaste	∂M/∂P	3.826	4.85	0.75	4.95	4.92	0.27	0-0.5 GPa; *dG/dP* calculated from Chung (1967)
Mg_2GeO_4	∂M/∂P	4.32				4.22	1.33	Rigden & Jackson (1991); polycrystal; 0-3 GPa
	M	4.390	300	126	118	179	110	Weidner & Hamaya (1983)
Ni_2GeO_4	*M*	6.02				203	96	Rigden & Jackson (1991); polycrystal
	∂M/∂P	6.02				4.78	0.67	0-3 GPa
Ni_2SiO_4	∂M/∂P	5.12				7.61	1.42	Rigden & Jackson (1991); polycrystal; 0-3 GPa
	M	5.350	367	107	156	226	106	Bass et al. (1984)
Olivine (γ-phase)								
Mg_2SiO_4	*M*	3.559	327	130.7	114	185	120.4	Jackson et al. (2000)
ringwoodite	∂M/∂T	3.559	-5.0	-1.2	-1.1	-2.4	-1.5	298-873 K
	M	3.559	327	126	112	184	119	Weidner et al. (1984)
$(Mg_{0.91}Fe_{0.09})_2SiO_4$ ringwoodite	*M*	3.701	329	130	118	188	119	Sinogeikin et al. (1998)
$(Mg_{0.75}Fe_{0.25})_2SiO_4$ ringwoodite	*M*	3.878				193	113	Sinogeikin et al. (1997b); polycrystal
Perovskite								
$SrTiO_3$	*M*	5.116				179	113	Fischer et al. (1993); polycrystal
(perovskite)	∂M/∂P	5.116				4.3	1.38	0-3 GPa
Non-Oxides (a sampling only)								
BaF_2 frankdicksonite	*M*	4.886	91.99	25.68	41.57	58.38	25.49	Wong & Schuele (1968)
	∂M/∂P	4.886	4.84	0.772	5.17	5.05	0.39	0-0.2 GPa; *dG/dP* calculated from Chung (1967)
	∂M/∂T	4.886	-2.04	-0.73	-1.31	-1.55		195-298 K

	M	4.886	90.7	25.3	41.0	57.8	25.1	Hearmon (1979)
CdF_2	M	6.386	182.7	21.75	66.74	105.4	32.52	Alterovitz & Gerlich (1970b); all data at 295 K
	$\partial M/\partial P$	6.386	7.11	1.35	5.52	6.05	1.32	0-0.25 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	6.386	-6.78	-1.16	-3.39	-4.52		285-301 K
CaF_2 flourite	M	3.181	164.2	33.7	44.0	84.1	42.5	Wong & Schuele (1968)
	$\partial M/\partial P$	3.181	6.05	1.31	4.35	4.92	1.22	0-0.2 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	3.181	-3.18	-1.22	-1.05	-1.77		195-298 K
	M	3.181	165	33.9	47	86.3	42.4	Hearmon (1979)
CsBr	M	4.454	30.8	7.60	8.27	15.8	8.90	Chang et al. (1967); C_{ij}'s at 286 K
	$\partial M/\partial P$	4.454	6.30	3.68	4.93	5.38	2.78	0-0.96 GPa; *dG/dP* calculated from Chung (1967)
CsCl	M	3.990	36.8	8.17	8.93	18.2	10.1	Chang et al. (1967) ; C_{ij}'s at 286 K
	$\partial M/\partial P$	3.990	6.82	3.56	5.05	5.64	2.87	0-0.4 GPa; *dG/dP* calculated from Chung (1967)
CsI	M	4.529	24.6	6.4	6.6	12.6	7.34	Chang et al. (1967); C_{ij}'s at 286 K
	$\partial M/\partial P$	4.529	6.57	3.72	4.90	5.46	2.82	0-0.96 GPa; *dG/dP* calculated from Chung (1967)
FeS_2 pyrite	M		402	114	-44	105	150	Hearmon (1984)
	M	5.016	361	105.2	33.6	143	126	Simmons & Birch (1963)
KCl sylvite	M	1.982	40.1	6.35	6.6	17.8	9.0	Yamamoto and Anderson (1987); Anderson & Isaak (1995); 294-870 K; numerical derivatives not cited in references
	$\partial M/\partial T$	1.982	-3.39	-0.149	+0.366	-0.842	-0.483	
	$\partial^2 M/\partial T^2$	1.982			-2.8		-1.1	
	M	1.987	40.50	6.30	6.98	18.15	9.36	Bartels & Schuele (1965)
	$\partial M/\partial P$	1.987	12.82	-0.385	1.60	5.34		0-0.33 GPa
LiBr	$\partial M/\partial P$		10.4	1.80	2.89	5.39		McClean & Smith (1972)
LiCl	$\partial M/\partial P$		10.4	1.70	2.95	5.42		McClean & Smith (1972)
	$\partial M/\partial P$		9.83	1.60	2.57	4.99		Bartels et al. (1970)

LiF	$\partial M/\partial P$		10.0	1.38	2.81	5.21		McClean & Smith (1972)
LiI	$\partial M/\partial P$		11.1	1.96	3.12	5.79		McClean & Smith (1972)
NaCl halite	M	2.159	49.5	12.79	13.2	25.3	14.71	Yamamoto et al. (1987); Anderson & Isaak (1995)
	$\partial M/\partial T$	2.159	-3.67	-0.317	+0.256	-1.05	-0.863	298-770 K; numerical derivatives not cited references
	$\partial^2 M/\partial T^2$	2.159	3.6	-1.2	-7.5	-3.8		
	M		49.36	12.78	12.88	25.04	14.74	Ghafelehbashi & Koliwad (1970)
	$\partial M/\partial P$		11.83	0.370	1.197	5.27	1.86	0-0.25 GPa; *dG/dP* calculated from Chung (1967)
	M	2.164	48.99	12.72	12.57	24.71	14.69	Bartels & Schuele (1965)
	$\partial M/\partial P$	2.164	11.66	0.37	2.08	5.27	1.82	0-0.33 GPa; *dG/dP* calculated from Chung (1967)
NaF	M		96.3	27.6	23.9	48.2	30.8	Bensch (1972)
	$\partial M/\partial P$		12.7	0.28	2.5	5.9	1.9	0-0.004 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$		-5.84	-0.45	+0.32	-1.73		
PbS galena	M	7.597	127	23	24.4	58.6	31.9	Hearmon (1984); Bass (1995)
	$\partial M/\partial T$	7.597				-3.9		77-300 K (see Padaki et al. (1981) for $\partial C_{ij}/\partial T$)
	M	7.607	126.2	17.1	16.2	52.9	27.5	Peresada et al. (1976)
	$\partial M/\partial P$	7.607	14.84	-0.0097	2.01	6.28	1.51	0-1.7 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	7.607	-227	-14.5	-87	-135		
RbBr	M	3.359	31.63	3.840	4.67	13.66	6.41	Chang & Barsch (1971)
	$\partial M/\partial P$	3.359	13.38	-0.559	1.26	5.30	0.908	0-0.37 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	3.359	-160	-12	-40	-80		
	$\partial M/\partial T$	3.359	-2.77	-0.091	+0.351	-0.689		288-308 K
	M	3.4498	31.52	3.801	5.000	13.84	6.33	Ghafelehbashi et al. (1970)
	$\partial M/\partial P$	3.4498	13.62	-0.587	1.46	5.51	0.891	0-0.4 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	3.4498	-2.82	-0.082	+0.355	-0.703		140-300 K
RbCl	M	2.818	36.59	4.753	6.153	16.30	7.64	Chang & Barsch (1971)
	$\partial M/\partial P$	2.818	13.16	-0.605	1.45	5.35	0.861	0-0.45 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	2.818	-110	-11	-30	-60		
	$\partial M/\partial T$	2.818	-3.11	-0.106	+0.350	-0.803		288-308 K

	M	2.7969	36.24	4.678	6.124	16.16	7.60	Ghafelehbashi et al. (1970)
	$\partial M/\partial P$	2.7969	13.73	-0.61	1.34	5.47	0.94	0-0.4 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	2.7969	-3.08	-0.093	+0.340	-0.80		100-300 K
	$\partial M/\partial P$		12.61	-0.64	1.55	5.24		Bartels et al. (1970)
RbI	M	3.564	25.73	2.790	3.776	11.09	4.90	Chang & Barsch (1971)
	$\partial M/\partial P$	3.564	13.56	-0.494	1.33	5.41	0.934	0-0.3 GPa; *dG/dP* calculated from Chung (1967)
	$\partial^2 M/\partial P^2$	3.564	-180	-13	-20	-80		
	$\partial M/\partial T$	3.564	-2.37	-0.058	+0.319	-0.577		288-308 K
	M	3.565	25.62	2.780	4.06	11.25	4.85	Fontanella & Schuele (1970)
	$\partial M/\partial P$	3.565	13.16	-0.51	1.66	5.49	0.84	0-0.16 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	3.565	-2.27	-0.0524	+0.37	-0.51		
	M	3.551	25.56	2.78	3.82	11.07	4.87	Ghafelehbashi et al. (1970)
	$\partial M/\partial P$	3.551	13.73	-0.61	1.34	5.47	0.85	0-0.4 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	3.551	-2.42	-0.056	+0.328	-0.587		120-300 K
SrF_2	M	4.278	124.6	31.87	44.63	71.29	34.91	Alterovitz & Gerlich (1970a); all data at 295 K
	$\partial M/\partial P$	4.278	5.25	1.07	4.52	4.76	0.83	0-0.25 GPa; *dG/dP* calculated from Chung (1967)
	$\partial M/\partial T$	4.278	-2.39	-0.92	-1.25	-1.63		273-300 K
ZnS sphalerite	M	4.088	102	44.6	64.6	77.1	31.5	Hearmon (1984); Bass (1995)