

**Appendix 1.** List of the representative phase components with the barycentric formula (cation). d07: Diener et al. (2007); hp98: Holland and Powell (1998); hp01: Holland and Powell (2001); ph99: Powell and Holland (1999); w01: White et al. (2001); ts: this study.

Phase	Phase component		Chemical formula	Reference
	Abbreviation		barycentric formula (cation units)	
and	and	andalusite		hp98
sill	sill	sillimanite	$\frac{1}{3}\text{Al}_2\text{SiO}_5$	hp98
ky	ky	kyanite		hp98
biotite (bi)	phl	phlogopite	$\frac{1}{10}\text{KMg}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$	hp98
	ann	annite	$\frac{1}{10}\text{KFe}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$	hp98
	east	eastonite	$\frac{1}{10}\text{KMg}_2\text{Al}_3\text{Si}_2\text{O}_{10}(\text{OH})_2$	hp98
	obi	ordered biotite	$\frac{1}{10}\text{KMg}_2\text{FeAlSi}_3\text{O}_{10}(\text{OH})_2$	ph99
	mnbi	Mn-biotite	$\frac{1}{10}\text{KMn}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$	hp98
chlorite (chl)	afchl	Al-free chlorite	$\frac{1}{18}\text{Mg}_6\text{Si}_4\text{O}_{10}(\text{OH})_8$	hp98
	clin	clinocllore	$\frac{1}{18}\text{Mg}_5\text{Al}_2\text{Si}_3\text{O}_{10}(\text{OH})_8$	hp98
	daph	daphnite	$\frac{1}{18}\text{Fe}_5\text{Al}_2\text{Si}_3\text{O}_{10}(\text{OH})_8$	hp98
	ames	amesite	$\frac{1}{18}\text{Mg}_4\text{Al}_4\text{Si}_2\text{O}_{10}(\text{OH})_8$	hp98
	mnchl	Mn-chlorite	$\frac{1}{18}\text{Mn}_5\text{Al}_2\text{Si}_3\text{O}_{10}(\text{OH})_8$	hp98
cordierite (cd)	crd	cordierite	$\frac{1}{11}\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$	hp98
	fcrd	Fe-cordierite	$\frac{1}{11}\text{Fe}_2\text{Al}_4\text{Si}_5\text{O}_{18}$	hp98
	hcrd	hydrous cordierite	$\frac{1}{13}\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18} \cdot \text{H}_2\text{O}$	hp98
	mnrd	Mn-cordierite	$\frac{1}{11}\text{Mn}_2\text{Al}_4\text{Si}_5\text{O}_{18}$	hp98
H2O/fl	H2O/fl	water fluid	$\frac{1}{2}\text{H}_2\text{O}$	hp98/ts
garnet (g)	py	pyrope	$\frac{1}{8}\text{Mg}_3\text{Al}_2\text{Si}_3\text{O}_{12}$	hp98
	alm	almandine	$\frac{1}{8}\text{Fe}_3\text{Al}_2\text{Si}_3\text{O}_{12}$	hp98
	gr	grossular	$\frac{1}{8}\text{Ca}_3\text{Al}_2\text{Si}_3\text{O}_{12}$	hp98
	spss	spessartine	$\frac{1}{8}\text{Mn}_3\text{Al}_2\text{Si}_3\text{O}_{12}$	hp98
gedrite (ged) / anthophyllite (anth)	anth	anthophyllite	$\frac{1}{17}\text{Mg}_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07
	ged	gedrite	$\frac{1}{17}\text{Mg}_5\text{Al}_4\text{Si}_6\text{O}_{22}(\text{OH})_2$	d07
	ompa	ortho-Mg-pargasite	$\frac{1}{18}\text{NaMg}_6\text{Al}_3\text{Si}_6\text{O}_{22}(\text{OH})_2$	d07
	omgl	ortho-glaucophane	$\frac{1}{17}\text{Na}_2\text{Mg}_3\text{Al}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07
	otr	ortho-tremolite	$\frac{1}{17}\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07
	fanth	ferro-anthophyllite	$\frac{1}{17}\text{Fe}_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07
	a	amo1	$\frac{1}{17}\text{Fe}_2\text{Mg}_3\text{Fe}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07
	b	amo2	$\frac{1}{17}\text{Fe}_2\text{Fe}_3\text{Mg}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$	d07

## Appendix 1. (continued).

Phase	Phase component		Chemical formula	Reference
	Abbreviation		barycentric formula (cation units)	
K-feldspar (ksp)	san	sanidine	$\frac{1}{5}\text{KAlSi}_3\text{O}_8$	hp98
	ab	albite	$\frac{1}{5}\text{NaAlSi}_3\text{O}_8$	hp98
	an	anorthite	$\frac{1}{5}\text{CaAl}_2\text{Si}_2\text{O}_8$	hp98
melt (liq)	qL	silica liquid	$\frac{1}{4}\text{Si}_4\text{O}_8$	hp01
	abL	albite liquid	$\frac{1}{5}\text{NaAlSi}_3\text{O}_8$	hp01
	kspL	K-feldspar liquid	$\frac{1}{5}\text{KAlSi}_3\text{O}_8$	hp01
	anL	anorthite liquid	$\frac{1}{5}\text{CaAl}_2\text{Si}_2\text{O}_8$	hp01
	silL	sillimanite liquid	$\frac{5}{24} \cdot \left[ \frac{8}{5}\text{Al}_2\text{SiO}_5 \right]$	hp01
	foL	forsterite liquid	$\frac{1}{6}\text{Mg}_4\text{Si}_2\text{O}_8$	w01
	faL	fayalite liquid	$\frac{1}{6}\text{Fe}_4\text{Si}_2\text{O}_8$	w01
	h2oL	H <sub>2</sub> O liquid	$\frac{1}{2}\text{H}_2\text{O}$	hp01
muscovite (mu)	mu	muscovite	$\frac{1}{9}\text{KAl}_3\text{Si}_3\text{O}_{10}(\text{OH})_2$	hp98
	pa	paragonite	$\frac{1}{9}\text{NaAl}_3\text{Si}_3\text{O}_{10}(\text{OH})_2$	hp98
	cel	celadonite	$\frac{1}{9}\text{KMgAlSi}_4\text{O}_{10}(\text{OH})_2$	hp98
	fcel	Fe-celadonite	$\frac{1}{9}\text{KFeAlSi}_4\text{O}_{10}(\text{OH})_2$	hp98
olivine (ol)	fo	forsterite	$\frac{1}{3}\text{Mg}_2\text{SiO}_4$	hp98
	fa	fayalite	$\frac{1}{3}\text{Fe}_2\text{SiO}_4$	hp98
orthopyroxene (opx)	en	enstatite	$\frac{1}{4}\text{Mg}_2\text{Si}_2\text{O}_6$	hp98
	fs	ferrosilite	$\frac{1}{4}\text{Fe}_2\text{Si}_2\text{O}_6$	hp98
	mgts	Mg-Tschermak's pyroxene	$\frac{1}{4}\text{MgAl}_2\text{SiO}_6$	hp98
	fm	Fe-Mg-ordered pyroxene	$\frac{1}{4}\text{FeMgSi}_2\text{O}_6$	ph99
plagioclase (pl)	ab	albite	$\frac{1}{5}\text{NaAlSi}_3\text{O}_8$	hp98
	an	anorthite	$\frac{1}{5}\text{CaAl}_2\text{Si}_2\text{O}_8$	hp98
	san	sanidine	$\frac{1}{5}\text{KAlSi}_3\text{O}_8$	hp98
q	q	quartz		hp98
trd	trd	tridymite	$\text{SiO}_2$	hp98
crst	crst	cristobalite		hp98
staurolite (st)	mst	Mg-staurolite	$\frac{1}{33.5}\text{Mg}_4\text{Al}_{18}\text{Si}_{7.5}\text{O}_{48}\text{H}_4$	hp98
	fst	Fe-staurolite	$\frac{1}{33.5}\text{Fe}_4\text{Al}_{18}\text{Si}_{7.5}\text{O}_{48}\text{H}_4$	hp98
	mnst	Mn-staurolite	$\frac{1}{33.5}\text{Mn}_4\text{Al}_{18}\text{Si}_{7.5}\text{O}_{48}\text{H}_4$	hp98