

Supplementary Table 1. Compositional groups, typical sample numbers and location with their bulk compositional, mineralogical and petrographic characteristics at different metamorphic grades.

Metamorphic grade	Compositional Group	Sample #s, N/E Traverse, GPS coordinates	Bulk Chemical Characteristics	Mineral assemblage, mode and mineral chemistry	Texture and other comments
Chlorite	Normal	#1/00, E, 27°11.268, /88°38.581 #187/01, 187/3, 187/3/CHAKRA, N, GPS not known	Two compositional groups (one richer in Al ₂ O ₃ ~25 wt.%, another ~20 Wt.%). Rocks richer in Al ₂ O ₃ are relatively less ferruginous (see Fig 3).	Ms-Chl-Qtz-Ilm-Mag-Gr ± Kfs ± Pl Mode: (Qtz 35-42%, Ms 30 - 33%, Chl 25 - 30%, Pl 5-7%). Lithology: Chlorite quartz phyllite (minor white mica), white mica quartz phyllite (minor chlorite) and chlorite bearing quartzite. Muscovite: Paragonite 5%, Pyrophyllite 19%, Celadonite 12%, Fe-celadonite 13%. Chlorite: X_{Mg} (Mg/(Mg+Fe(tot))) = 0.37 - 0.41. Plagioclase: X_{An} = 0.03	Millimeter to centimeter scale banding into M-domain (mica + chlorite rich), grain size 2 - 20 μ m and Q - domain (quartz - feldspar rich), grain size 10 - 50 μ m.

Biotite	Normal	#ID/00,E, 27°11.268, /88°38.581		Ms-Chl-Qtz-Bt - Pl ± Ilm ± Tur ± Gr Chl - Qtz - Ms - Ilm -Gr - Tur - Bt - Pl	Pervasive foliation defined by biotite, white mica, chlorite and occasional ilmenite (S ₂) almost parallel to compositional banding (S ₀). S ₂ is crenulated to S ₃ defined by new generation of biotite, ilmenite and elongated quartz in Q - domains. Some coarser biotite, chlorite as well as plagioclase cross cut all foliations and appear to be post-tectonic.
		#2/00, E, 27°11.465, /88°38.650	Two subgroups - high Al, low Fe (18 - 24 wt% Al ₂ O ₃ , - 4.5-5 wt% Fe ₂ O ₃) and low Al, high Fe (14.5 - 17 wt% Al ₂ O ₃ , 6.0 - 8.0 wt% Fe ₂ O ₃). Some with high MnO (0.37 - 0.59 wt%). SiO ₂ variable indicating interbanding of variable amounts of psammitic material, TiO ₂ relatively constant (0.55 - 0.8 wt% for most samples).	Mode: (Qtz 35-42%, Ms 30 - 33%, Bt 15 - 18%, Chl 10 - 12%, Pl 5-7%).	
		#3/00, E, 27°11.465, /88°38.692		Muscovite:	
		#4/00, E, 27°11.484, /88°38.858		Paragonite 10 -15%, Pyrophyllite 22 - 28%, Celadonite 6 -9%, Fe-celadonite 6-14%.	
		#167/01, N, 27°26.092, /88°30.888		Biotite: X _{Mg} = 0.38, X _{Fe} = 0.45, X _{Ti} = 0.03, X _(Al+Vi) = 0.14.	
		#176/01,N, 27°24.809, /88°30.935		Chlorite: X _{Mg} (Mg/(Mg+Fe(tot))) = 0.45.	
		#170/01,N, 27°24.809, /88°30.925		Plag: X _{An} = 0.03	

Biotite	Magnesian (Normal - biotite)	#1/00/A, E, 27°11.268, /88°38.581	MgO ~ 5 wt%.	Chlorite - quartz - plagioclase ± muscovite Muscovite: Paragonite 7 - 12%, Pyrophyllite 16 - 33%, Celadonite 11 - 13%, Fe-celadonite 12%. Chlorite: X_{Mg} (Mg/(Mg+Fe(tot))) = 0.65. Plagioclase: X_{An} = 0.1	Foliation defined by chlorite and white mica; crenulation by second generation white mica.
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Biotite	Mn-rich (Normal + Grt)	# 1C/00/3, E 27°11.288, /88°38.619	MnO ~ 0.4 wt%, ~ 10 x other bulk compositions.	Ms - Chl - Qtz - Pl - Grt - Mag - Ilm - Gr. Garnet: Concentric growth zoned with Mn and Ca decreasing to rim compensated by increase of Fe and Mg. Core: $\text{Sps}_{50}\text{Alm}_{34}\text{Prp}_3\text{Grs}_{13}$ Rim: $\text{Sps}_{20}\text{Alm}_{63}\text{Prp}_{07}\text{Grs}_{10}$ Muscovite: Paragonite 14%, Pyrophyllite 15%, Celadonite 6%, Fe-celadonite 15%. Chlorite: X_{Mg} ($\text{Mg}/(\text{Mg}+\text{Fe}(\text{tot})) = 0.47$; Mn-rich with 0.5 - 0.6 wt% MnO (= 10x other rocks). Plagioclase porphyroblasts reverse zoned, unlike in other rocks, from An_{26} (core) - An_{10} (rim).	150 - 200 μm euhedral garnet porphyroblasts set in external S_2 fabric defined by white mica. Elongate quartz and opaque inclusions near core of garnet define an internal fabric (? S_1) at high angles to the external fabric. Coarse plagioclase as well as later generation of mica and chlorite cut across main foliation. Quartz is coarse, polygonal in Q-domains and elongate in M-domains.
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Garnet	Ferruginous (<i>Normal + Chltd</i>)	#7/00/R4 & 7/00/R/6, E, 27°11.616, /88°39.131 #135/01, E, GPS not known	Similar in Mn and even lower in Al content to garnet bearing rocks from the same outcrop (e.g. #8/00). Fe/Mg ratio - higher Fe contents - favor appearance of chloritoid.	Ms - Cld - Qtz - Chl - Bt - Ilm ± Gr ± Grt Mode: (Qtz 35-40%, Cld 12 - 16%, Grt 4-8%, Chl 8 - 16%, Ms 20 - 22%, Bt 8-10%, Pl 6-10%). Cld: $X_{Mg} = 0.1$ Chlorite: $X_{Mg} = 0.25$ Biotite: $X_{Mg} = 0.39$, $X_{Ti} = 0.04$, $X_{(AlVI)} = 0.18$.	Chloritoid porphyroblasts may be aligned along S_2 or S_3 foliation. Ilmenite is often included in chloritoid. In one case chloritoid and garnet occur in the same thin section but in different domains - chloritoid occurs in more muscovite rich domains. There is a single chloritoid inclusion in a garnet in #135/01.
Garnet	Low Potassic (semi - pelite) (<i>Normal - Musc</i>)	#10/00, E, 27°11.628, /88°39.459;		Chl - Qtz - Grt - Pl - Bt - Ap - Ilm Garnet: $Alm_{80}Prp_{12}Grs_{04}Sps_{04}$, even richer in almandine (82) at the rim. Biotite: $X_{Mg} = 0.28$, $X_{Fe} = 0.55$, $X_{Ti} = 0.03$, $X_{(AlVI)} = 0.14$. Chlorite: $X_{Mg} = 0.36$. Plagioclase: $X_{An} = 0.15 - 0.17$.	Chlorite - garnet - plagioclase rich rock with chlorite and biotite defining S_2 foliation. Euhedral garnet overprints, and sometimes deflects, this foliation.

Staurolite	Normal	#17/00, E, 27°12.064, /88°41.397	Equivalent of low alumina pelites from lower grades.	Ms - Qtz -St - Pl - Bt - Ilm - Grt Mode: (Qtz 35 - 44%, Ms 15 - 17%, Bt 18 -22%, St 9 - 11%, Grt 5-10%, Pl 5 - 10%). Garnet: Core: Alm₆₃Prp₁₂Grs₀₈Sps₁₇, with well preserved growth zoning. Increase of Mn content at the very rim. Muscovite: Paragonite 17%, Pyrophyllite 12%, Celadonite 5%, Fe-celadonite 10%. Biotite: $X_{Mg} = 0.4$, $X_{Fe} = 0.42$, $X_{Ti} = 0.02$, $X_{(AlIV)} = 0.16$. Staurolite: $X_{Fe} = 0.78$.	Muscovite and biotite define foliation (S_2). Sigmoidal inclusion trails of S_2, including ilmenites, within staurolite and garnet. Foliation wraps around porphyroblasts.
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Staurolite	Aluminous (Normal + kyanite)	#11/00, E,		Ms -Bt -Grt -St - Ky - fibrolite -Grt - Ilm – Qtz ± Cld, secondary Chl. Some locations contain abundant and strongly zoned Tur. Garnet: Core: $\text{Alm}_{83}\text{Prp}_{09}\text{Gr}_{506}\text{Sps}_{02}$, distinctly poorer in Mn and only weakly zoned ($\square X_{\text{Alm}} \sim \square X_{\text{prp}} \sim 0.02$). Muscovite: Paragonite 18%, Celadonite 4.5%, Fe-celadonite 7.5%. Biotite: $X_{\text{Mg}} = 0.34$, $X_{\text{Fe}} = 0.45$, $X_{\text{Ti}} = 0.05$, $X_{(\text{AlVI})} = 0.16$. Plagioclase: $X_{\text{An}} = 0.2$. Staurolite: $X_{\text{Fe}} = 0.82 - 0.86$ (included chloritoid has $X_{\text{Fe}} = 0.85$).	Muscovite and biotite define S_2, garnet and staurolite include sigmoidal trails of S_2, kyanite is coarse prismatic. Rare chloritoid inclusion in garnet coexisting with staurolite. Tourmaline can define folded inclusion trails in staurolite sometimes. Fibrolite often surrounds garnet, biotite with ilmenite, can be folded into crenulations occasionally.
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Staurolite	Calcic (Normal - Staurolite)	#14/00, E, 27°12.174, /88°41.026	CaO = 3.7 wt% compared to general range of 0.15 - 0.52 %.	Ms - Bt - Qtz - Pl - Grt - Ilm Garnet: Exceptionally rich in Sps and Grs in Core: Alm₅₀Prp₀₉Grs₁₄Sps₂₇, with well preserved growth zoning. Plagioclase rich in An: X_{An} = 0.34	Abundant garnet and plagioclase; in spite of high Al as well as Zn content, Staurolite does not appear, indicating that its appearance is controlled by Ca (e.g. Spear and others 1995).
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Staurolite	Mn - poor (Normal, with Mn poor garnet)	#15/00, E, 27°12.157, /88°41.137 #16/00, E, 27°12.100, /88°41.250		Ms - Qtz -St - Pl - Bt - Ilm - Grt Garnet: Core: Alm₇₃Prp₀₅Grs₁₃Sps₀₉, Rim: Alm₈₄Prp₁₀Grs_{5.5}Sps_{0.5}. Muscovite: Paragonite 17%, Pyrophyllite 12%, Celadonite 5%, Fe-celadonite 10%. Biotite: $X_{Mg} = 0.4$, $X_{Fe} = 0.42$, $X_{Ti} = 0.02$, $X_{(Al+V)} = 0.16$. Staurolite: $X_{Fe} = 0.85$. Plagioclase: $X_{An} = 0.2$.	
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Staurolite	Fe-rich ? (Normal - garnet)	#129/87, GPS not available		Ms - Qtz - St - Pl - Bt - Ilm. Ms & Bt similar to normal pelite. Staurolite, highly abundant: $X_{Fe} = 0.83$. Plagioclase: $X_{An} = 0.2 - 0.22$.	
Kyanite	Normal	#19/00, E, 27°12.135, /88°41.778 #SIN8,N,GPS not available #27/99/1,N, 27°30.906, /88°33.981 #27/99/3,N, 27°30.906, /88°33.981	Low Al, high Fe as well as high Al, low Fe groups are represented. Bulk composition shows the widest spread in this zone. One exceptionally Mn rich (MnO = 1.1 wt%) sample was found. Three samples (#Sin8, 19/00/1, 18/00) contain high CaO (1.2 - 1.4 wt% compared to 0.4 -0.8 wt% for the rest).	Grt - Bt - Pl - Qtz - Ms ± St (only as included phase) - Ky - Ilm. Mode: (Qtz 42-45%, Ms 15-17%, Bt 12 - 20%, Ky 4-8%, Grt 4-8%, Pl 10 - 15%). Garnet: Core: $Alm_{72}Prp_{16}Grs_{11}Sps_{01}$, Rim: $Alm_{83}Prp_{06}Grs_{05}Sps_{06}$. Large variations, with nearly homogeneous grains to complexly zoned crystals, where internal S-shaped compositional zoning bands follows inclusion trails, surrounded by an external concentric zoning . Overall range in garnet composition: $Alm_{70-85}Prp_{04-16}Grs_{03-11}Sps_{01-06}$.	Kyanite, muscovite and biotite define foliation (S_2) that is folded (S_3) at places. Modal abundance of garnet varies widely. Sigmoidal inclusion ridden garnet cores are overgrown by euhedral garnet. Biotite-fibrolite mattes are locally found. Rare staurolite inclusions in garnet. Modal abundance of kyanite correlates with Al content, that of garnet with Fe content of bulk rock.

				Muscovite: (Note low paragonite content) Paragonite 9%, Pyrophyllite 3%, Celadonite 9%, Fe-celadonite 4%. Biotite: $X_{Mg} = 0.5$, $X_{Fe} = 0.4$, $X_{Ti} = 0.05$, $X_{(AlVI)} = 0.05$. Plagioclase: $X_{An} = 0.44$. Included Staurolite: $X_{Fe} = 0.73$. Qtz - Plag bearing leucosomes with garnet: Garnet: Concentric zoning, Mg increases from core to rim compensated by Fe; growth zoning of Mn partly preserved, sharp increase of Mn at rim. $Alm_{76-81}Prp_{9-12}Grs_{05-10}Sps_{02-05}$. Plagioclase: $X_{An} = 0.2$. Biotite in restitic part:	Quartz - plagioclase bearing leucosomes develop often with a biotite rich restite part. In one case, euhedral garnets are found in the leucosome (with different composition and zoning from the usual garnets), when there are none in the biotite rich restitic part. The plagioclase in this part is also more sodic than usual.
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				1.8 wt% TiO ₂ . X _{Fe} = 0.50 - 0.55, X _{Mg} = 0.32 - 0.28, X _{Ti} = 0.03, X _{Al(VI)} = 0.15 - 0.18.	
Kyanite	Aluminous (Normal - Grt)	#19/00/1, E, 27°11.955, /88° 41.514		Qtz - Ms - Bt - Pl - Ky - Ilm Mineral chemistry similar to above.	Other than absence of garnet, similar to above. Widespread and occurs in close proximity with the normal pelites. In compositional space a continuum is found, where the boundary has been drawn here based on appearance of garnet.
Kyanite	Mn - rich	#18/00, E, 27°11.955, /88° 41.514 #18/00/2, E, 27°11.955, /88° 41.514	MnO highly enriched, upto 1 wt%.	Qtz - Pl - Ms - Bt - Grt - Ilm ± Ky ± St. Garnet: Alm ₅₇ Prp ₁₃ Gr _{s08} Sps ₁₇ .	Micas define foliation (S ₂). Unique texture with many euhedral to subhedral garnets dotting the quartzo-feldspathic as well as micaceous layers giving the <i>appearance</i> of post-tectonic growth.

Sillimanite - muscovite	Normal	#20/00, E, 27°12.195, /88°42.29; #29/99 & M4, N, 27°31.757, /88°36.369	Both low Al, high Fe and high Fe, low Al groups represented. No Mn rich samples found.	Qtz -Bt - Ms - Sil ± Grt - Pl ± Ky - Ilm Garnet: (Absent in high Al, Fe poor bulk compositions) Nearly homogeneous crystals, with prominent increase of Mn near rim. Sometimes compositional zones show sigmoidal patterns mimicking the inclusion pattern. Typical Core: Alm₈₀Prp₁₅Gr_{4.5}Sps_{0.5} Typical Rim: Alm₈₄Prp₁₂Gr₃Sps₀₁. Total spread: Alm₇₆₋₈₄Prp₉₋₁₅Gr₃₋₁₁Sps₀₋₆. Biotite: $X_{Fe} = 0.49$, $X_{Mg} = 0.31$, $X_{Ti} = 0.04$, $X_{(ALVI)} = 0.16$. Muscovite: Paragonite 11%, Pyrophyllite 13%, Celadonite 8%, Fe-celadonite 7%. Plagioclase: $X_{An} = 0.16$.	Segregation of leucocratic and more mafic layers, no modal abundances obtained. Prismatic sillimanite, rare kyanite, and frequent presence of fibrolite (replacing muscovite and biotite). Muscovite, biotite and sillimanite define main foliation (S₂). Garnet has inclusion ridden cores and inclusion free, idioblastic rims.
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Sillimanite - K- Feldspar	Normal	#29/00, E, 27°12.695, /88°43.436	Both low Al, high Fe and high Fe, low Al groups represented. No Mn rich samples found.	Qtz - Bt - Kfs -Pl - Sil ± Grt - Ilm. Garnet: Alm₆₀₋₇₉Prp₁₁₋₂₅Grs₂₋₁₄Sps₂₋₅. Garnets preserve some growth zoning, with diffusion zoning at the rims. Many garnets have grown by coalescence from several nucleii (seen in element maps, e.g. Fig. 5d). Therefore, difficult and not meaningful to provide geometric core and rim compositions. Small, resorbed garnets from leucosomes are exceptionally enriched in Mn: Alm₆₀Prp₁₇Grs₀₃Sps₂₀. Biotite (adjacent or removed from garnet): X_{Mg} = 0.39, X_{Fe} = 0.42, X_{Ti} = 0.05, X_{AlVI} = 0.14. K-feldspar (sometimes pethitic, re-integrated): Or₆₆₋₇₃Ab₂₇₋₃₄. Plagioclase: X_{An} = 0.24.	Migmatitic rock with leucosomes (quartz - K-feldspar - minor plagioclase - occasional small euhedral garnets) and mesosomes (garnet - biotite - sillimanite). Biotite and sillimanite define main foliation (S₂).
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