ROLE OF SMALL-SCALE COMPETENCY VARIATION ON THE SYN-TECTONIC NEOBLAST OCCURRENCE AND DISTRIBUTION

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• Introduction

Petrographic features of metapelites from North Delhi fold belt (NDFB), India shows the To understand if the matrix heterogeneity between local domains had any role in remarkable textural variation of neoblastic phases even at a thin section-scale. Detailed determining the neoblast occurrences (texture, abudance etc.), statistical analysis (using textural study along with statistical analysis suggests the texture of the neoblastic phase PAST software(PAST 4.03) and Microsoft Excel was adopted along with detailed was significantly influenced by local-scale heterogeneity defined by matrix mineral petrography. Following parameters were measured using ImageJ (ImageJ 1.53t) software proportion. for this purpose:



Texture

The rock contains quartz-feldspar-mica (predominantly biotite) as matrix and garnet as neoblastic phase. Local variation in matrix mineral proportion defines domains dominantly composed of mica-poor quartz-feldspar rich layer (QL) and comparable proportion of quartz-feldspar-mica layer (QML)(Fig.1, 2). Neoblastic garnet shows the highest grain size in QL and it's ~ $2.5 \times 10^6 \mu m^2$.



Fig: Textural relationships in PPL

quartz-feldspar mica rich layer (QML)

Methodology

- Area covered by garnet
- Number of garnet grains in each layer
- Size of each garnet grain





Area covered by garnet (modal abundance of garnet) : higher in QL than QML(Fig.3) Number of garnet grains: higher in QL than QML(Fig.4)



Grain Size (log transformed value) -



Highest size of garnet grains - observed in QL. Also, the frequency of larger Garnet grains is higher in QL than QML. The class interval 13-14 is present in the QL but it's absent in QML. (Fig.5)



The grain size variation is also higher in QL while it's lower in QML. (Fig.6)

• Interpretation

- Bt is the most likely contributor of Fe-Mg for garnet as this is the only mafic reactant in this rock.
- The proportion, grain number and abundance of common (also maximum) size between the layers imply that the neoblastic garnet are more abundant in the Bt(Fe-Mg phase)poor layer(QL). This feature presumably suggests that the metamorphic Grt preferentially nucleated in the competent layer.
- During deformation, competent layer (QL) likely behaved more resistant compared to the QML (mica-rich layer) and therefore, supported the growth of the grains.
- Therefore, the results altogether suggest that the syn-kinematic mineral formation were favoured in competent layer. This could be related to higher resistance of those layers to deformation supporting nucleation and sub sequent growth of metamorphic phases.

References

- PAST 4.03 : s Hammer et al(2001)
- https://scholar.google.co.in/scholar?q=hammer+et+al.,+2001+past+4.03&hl=en&as_sdt=0&as_vis=1& oi=scholart
- ImageJ 1.53t : National Institutes of Health, Rockville, MD; http://imagej.net/ImageJ

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