



Melt extraction and migration during folding: an example from the Karakoram Shear Zone, India

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Efficient extraction of granitic melt from crustal sources requires the development of an extensive permeable network of melt-bearing leucosomes. We investigate rocks that have undergone deformation and melting within the Karakoram Shear Zone of Ladakh, NW India. Delicate structures are preserved in these rocks which record the growth of a permeable melt network and its subsequent destruction resulting from the interplay between folding and melt migration. During folding, melt migrated from rock pores into layer-parallel and axial-planar leucosomes, forming a metatexite with two interconnected sets of leucosomes, intersecting parallel to fold axis. Once the network was developed, folding and stretching was eased by melt migration and lubrication of axial planar foliation. Folding and melt migration led to layer disaggregation and the formation of a diatexite. A number of structures developed during this processes such as cusped fold hinge zones indicative of melt flow sense, disharmonic folds, truncated layering due to mass loss and shearing along axial planar leucosomes, and dragging and disruption of melanosomes. In this system melt migration was an integral part of deformation and assisted stretching and folding of metatexites while folding gave rise to a leucosome network and the pressure gradients that drove melt migration and the break-up of the metatexite to form a diatexite.