

Geology of Ladakh Himalayas in northern India: Deformation structures of mylonite along the Karakoram fault

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Deformation structures of mylonite along the Karakoram fault, 800 km long, between the Indian and Eurasian plates are studied to evaluate the long-term activity of the fault. The study field is Ladakh Himalayas in northern India.

The Karakoram fault trends NW-SE, and the granites along the fault exhibit mylonitic deformational features. The thickness of the mylonite zone is more than 1 km. Metamorphic rocks are often included in the mylonite zone. Foliation of the granite mylonite trends NW-SE and dips vertically. This is subparallel to the fault, and lineation is subhorizontal. Foliation of the metamorphic rocks is NW-SE trending and moderate to steep dipping. Foliation of the metamorphic rocks is NW-SE trending and moderate to steep dipping. The trend of the lineation is consistent with the dip direction of the foliation in some areas, and the lineation is subparallel to that of the granite mylonite in the other areas. Dextral sense of shear is deduced from deformation structures of granite mylonite and metamorphic rocks.

Grain sizes of feldspar phenocrysts and recrystallized quartz reduce and aspect ratio of enclaves increases toward the highly deformed zone. Metamorphic rocks are distributed in the highly deformed zone, and their distribution is partly subparallel to mylonitic foliation of the granite. The mylonites consist of two types, in which the recrystallized quartz grains have significantly different aspect ratios, showing that they have been deformed at different conditions. The former type of mylonite is exposed on the southwestern side of the deformed metamorphic rocks, and the latter is on the northeastern at Tangtse. This suggests that the two types of mylonites including metamorphic rocks juxtaposed due to the fault movement.