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Using quartz for determine deformation condition of Lakhshak granodiorite mylonites, NW of Zahedan, Iran

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The Lakhshak granitoid intrusion is cropping out in the northwest of the Zahedan, East south of Iran, as an elongated and deformed pluton between Lut and Afghan blocks. The south and southwest marginal part of this intrusion suffered mineralogical and textural changes during solid-state deformations. Due to mylonitization, the size and modal abundance of feldspar porphyroclasts in mylonite had decreased, whereas the modal abundance of small grains of biotite, plagioclase, K-feldspar and quartz had increased. C-axis quartz measurement and petrography study of Lakhshak granodiorite mylonite show that most of the quartz recrystallized with grain boundary migration mechanism. This recrystallization take place over 630 $\pm$ 30ºC temperatures. Most of the quartz deformed with prism [C] slip and maximum C-axis of these grains is close X-axis stereogram. Prism [C] slip occurs over 550-600ºC temperatures. Quartzes were deformed in during flatting ellipsoid stress and those C-axes occur to girdles shape around stereogram Z axis. Opening angle of the C-axis girdles range from 79-114 that measured in The XZ plane through Z and using of Opening angle thermometer show that Lakhshak granodiorite mylonites were deformed in 585-730ºC temperatures. plagioclase replaced by intergrowth quartz and feldspar with granophyric texture, presence of fine grains of quartz, feldspar and biotite aggregates grains in fracture-controlled openings in the primary feldspar crystals, presence of the unreformed granophiric texture in the margin of deformed orthoclase crystals, recrystallization of biotite laths and myrmekite formation around K-feldspar porphyroclass core are evidence of high temperature (over 550ºC) deformation at presence of some melts. Above evidence show that Lakhshak granodiorite mylonites was deformed in 585-730ºC and at present of some melts.