Texture analysis and deformation mechanism in peridotite

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In order to determine distribution of grain size, area S, perimeter and aspect ratio of olivine in peridotite, more than 1500 grains are statistically analyzed. Average values of aspect ratio, roundness and mean diameter are 1.83, 0.66 and 59.1 micron, respectively. Correlation between particle parameters is observed; e.g., perimeter is proportional to S^0.54. The shapes of olivine grains are self-similar, and the fractal dimension is 1.1. Further, fabric analysis of olivine shows that large relict grains are oriented against their slip systems and are not subject to deformation. However, small grains are recrystallized because their orientation is not against the slip systems. Effects of lattice orientation on grain size are also discussed in this paper.

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