

The effect of crystallographic anisotropy on normal grain growth of quartz

Hisashi Imoto[1]; Katsuyoshi Michibayashi[2]; Toshiaki Masuda[3]

[1] Geosciences, Shizuoka Univ.; [2] Inst. Geosciences, Shizuoka Univ; [3] Inst. of Geosciences, Shizuoka Univ.

Annealing experiments on agate were performed to investigate the effect of crystallographic anisotropy on normal grain growth in quartz. The experiments were conducted using a piston-cylinder apparatus at 800 degree and 500MPa for 0-66hr. Grain size of quartz increased from a few to a few tens of microns with time. Although grain's aspect ratios were nearly constant at around 0.6(b/a; b is smaller than a) during grain growth, we found that orientations of the longest axes in individual grains tend to be parallel to the orientations of their c-axes. Since the agate had a primary crystal-preferred orientation (CPO) of c-axis, this resulted in the development of shape-preferred orientation (SPO) during grain growth. Such effect on crystallographic anisotropy on normal grain growth of quartz may be important for post-deformation grain growth after the development of CPO of quartz to establish a final microstructure.