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The Effect of Crystallite Size and Texture on the Strength of $MgGeO_3$ Post-Perovskite[1] LOWELL MIYAGI, Yale University Department of Geology and Geophysics, New Haven CT, 06511 — In-situ radial synchrotron x-ray diffraction is used to measure lattice strain and lattice preferred orientation (texture) in $MgGeO_3$ post-perovskite synthesized and deformed in the diamond anvil cell up to 135 GPa. Lattice strains are used to calculate differential stress supported by the sample and can provide a lower bounds estimate on yield strength. $MgGeO_3$ post-perovskite synthesized from the enstatite phase exhibits a weak transformation texture of (100) planes at high angles to the direction of compression. In a sample with larger crystallites, pressure increase and deformation results in (001) lattice planes orienting nearly perpendicular to compression, consistent with dominant (001) slip. In another sample with smaller crystallites it is difficult to induce texture change, and differential stress is higher than in the sample with larger crystallites. When $MgGeO_3$ post-perovskite is synthesized from the perovskite phase a different transformation texture of (001) planes at high angles to compression is observed. This sample is able to support large differential stress as the direction perpendicular to the (001) plane is a plastically hard orientation for $MgGeO_3$ post-perovskite.

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