

X-ray diffraction study of post-garnet transition

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Post-garnet phases of pyrope-almandine-grossular system were investigated using a diamond anvil cell with laser heating system. The stable phases were identified by X-ray diffraction under pressure combined with synchrotron radiation at Tsukuba. The post-garnet phase basically consists of orthorhombic perovskite and stishovite. A corundum or unknown aluminous phase coexists with them at relatively low pressure and low temperature conditions. In the experiments of natural garnet which contain grossular component, a cubic perovskite phase was observed with perovskite and stishovite up to 70 GPa. From the unit cell volume under pressure, the unquenchable perovskite heated above 30 GPa may have different elastic property from the quenchable perovskite at relatively low pressure.