

## **Effect of the composition of the compressibility of skiagite-majorite garnet**

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Skiagite-Fe-majorite garnets were synthesized using a multianvil apparatus at 7.5-9.5 GPa and 1400-1600 K. Single-crystal X-ray diffraction at ambient conditions revealed that synthesized garnets have from 23 to 76 % of Fe-majorite component. It was found that the substitution of Fe<sup>2+</sup> and Si<sup>4+</sup> for Fe<sup>3+</sup> in the octahedral site decrease the unit-cell volume of garnets at ambient conditions. Analysis of single crystal X-ray diffraction data collected upon compression up to 90 GPa of garnets with different compositions reveal that with increasing majorite component the bulk modulus increases from 164(2) to 169(2) GPa. Our results in comparison with literature data unambiguously demonstrate importance of total iron content and Fe<sup>3+</sup>/Fe<sup>2+</sup> ratio in (Mg,Fe)-majorites for the diamond's formation in the Earth's mantle.