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High Pressure-Induced Phase Transition In β-Ga_2O_3: in situ Synchrotron X-Ray Diffraction Studies up to 70 Gpa[1] KRISTINA E. LIPINSKA-KALITA, Center for Nanoscale Device Research, Dept. of Electrical and Computer Eng. University of Nevada Las Vegas, PATRICIA E. KALITA, High Pressure Science and Engineering Center, Dept. of Physics, University of Nevada Las Vegas, RUSSELL J. HEMLEY, Geophysical Lab. Carnegie Institution of Washington, Washington DC, CEDRIC L. GOBIN, High Pressure Science and Engineering Center, Dept. of Physics, University of Nevada Las Vegas — A renewed interest in β-Ga_2O_3 has arisen since it has potential applications in optoelectronic devices. We performed *in situ* synchrotron radiation x-ray diffraction studies in a diamond anvil cell on β-Ga_2O_3 on compression up to 70 GPa and on successive decompression. The pressure-evolution of x-ray diffraction patterns was consistent with a low-to-high density phase transition. A thermodynamically stable β-Ga_20_3 phase was converted into the α-Ga_20_3 phase, which is unstable at ambient conditions. The effect of hydrostatic and non-hydrostatic compression conditions on the evolution of the phase transition was also investigated in compression and decompression cycles. This work is the first report of high-pressure investigations of Ga_2O_3 on compression up to 70 GPa.

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