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Characterization of phase transition on Ga₂O₃ induced by shock-recovery experiment HIROAKI KISHIMURA, HITOSHI MATSUMOTO, National Defense Academy of Japan — Shock recovery experiments on Ga₂O₃ sample were carried out by the impact of a flyer plate accelerated by a single-stage powder-propellant gun. A sintered pellet and a single crystalline plate of Ga₂O₃ were used. Sample was encapsulated in copper container. The recovered samples were characterized by X-ray diffraction (XRD) analysis and Raman spectroscopy. The recovered single crystalline sample was reduced to grains. Analysis of the shocked samples suggests that the onset pressure for the transition from the β - to α -Ga₂O₃ phase lies between 11 and 16 GPa. For the sample shocked at 20 GPa, most of Raman spectra were corresponding to β -Ga₂O₃ phase and the Raman spectra obtained from some of the grains that recovered from shock compression agreed with the α -Ga₂O₃ phase. The XRD pattern consisted of a mixture of β - and α -Ga₂O₃ phases. Although Ga₂O₃ exists five forms of crystal structure under ambient condition, all other structures except for β - and α -Ga₂O₃ were not observed.

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