

Abstract Submitted
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Synthesis of New Cubic C₃N₄ Phase under High Pressure and High Temperature LI CHUNG MING, PAVEL ZININ, University of Hawaii, YUE MENG, Argonne National Laboratory, XIU-RU LIU, SHI MING HONG, Southwest Jiaotong University, China, YI XIE, University of Science and Technology of China — Synchrotron-based X-ray diffraction studies were carried out on a graphite-like C₃N₄ (*g*-C₃N₄) phase subjected to high pressures up to 38 GPa and high temperatures of up to 3000 K using the laser-heated diamond-anvil cell. Laser-heating the sample to 1800 K at pressure between 20 and 38 GPa, a new set of diffraction pattern appeared, showing positively that a high-pressure phase was formed. Upon decompression of the post-lasered sample to 1 atmospheric pressure, the X-ray diffraction peaks of high-pressure phase were replaced completely by a new pattern, thus demonstrating a new metastable phase was formed retrogressively. X-ray diffraction data on the recovered phase show that it is a new cubic phase that does not match to any high-pressure phases in C₃N₄ predicted theoretically.

Li Chung Ming
University of Hawaii

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