

Abstract Submitted
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A new hexagonal carbon nitride synthesized at high pressure and high temperature MASAYA SOUGAWA, YUTA SHIMA, MASAOKI HIRAI, KENICHI TAKARABE, Okayama University of Science, TAKU OKADA, The Institute for Solid State Physics, University of Tokyo, THE INSTITUTE FOR SOLID STATE PHYSICS, UNIVERSITY OF TOKYO COLLABORATION — A new hexagonal carbon nitride has been synthesized by subjecting the $C_3N_4H_x$ precursor to high pressure and high temperature. The XRD pattern of the new hexagonal carbon nitride is indexed as the hexagonal unit cell with the lattice parameters; $a = b = 2.83 \text{ \AA}$, $c = 9.82 \text{ \AA}$ ($V = 68.10 \text{ \AA}^3$). The unit cell of this new hexagonal carbon nitride differs from the several hexagonal carbon nitrides reported so far by the theoretical and experimental studies. Hart et al. proposed the hexagonal CN structure with 1:1 stoichiometry is based on the known GaSe layer with the unit cell parameters of the hexagonal unit $a = b = 2.37 \text{ \AA}$, $c = 11.38 \text{ \AA}$ ($V = 55.36 \text{ \AA}^3$), respectively, and the space group is $P6_3/mmc$. Bojdys et al. synthesized the graphitic- C_3N_4 (g- C_3N_4) with the hexagonal unit cell with the lattice parameters; $a = b = 8.43 \text{ \AA}$, $c = 6.72 \text{ \AA}$ ($V = 414.09 \text{ \AA}^3$), and the space group is $P6_3cm$. These reported hexagonal lattice constants disagree with the new hexagonal carbon nitrides synthesized in this report. We will report the full analysis of the crystal structure of the new hexagonal carbon nitride at the conference.

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