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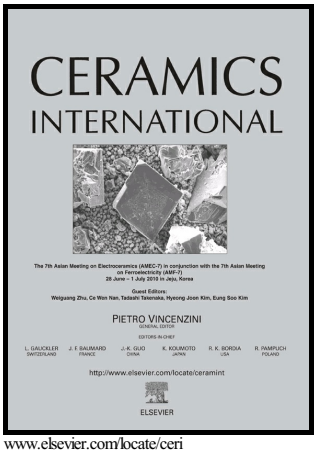

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Recover of C_3N_4 Nanoparticles Under High-Pressure by Shock Wave Loading

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Abstract

Theory predicts that β-C_3N_4 with its dense structure is a superhard material. In order to synthesize this material, light-gas gun loading and shock recovery technology were used to perform experiments. The amorphous nitrogen-enriched g-C3N4, produced by the thermal decomposition of melamine, was used as a precursor. The shock synthesis experiment was completed under the pressure of 50 GPa. A high-density phase with a β-C_3N_4 structure was detected only in the desired product. It is suspected that the elemental composition and synthetic pressure of precursors may be the main factors affecting the phase composition of products. This has significant potential for the synthesis of pure superhard carbonitride compounds.

Key words: shock wave, synthesis, superhard material, thermal decomposition, C3N4, recovery.

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