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Synthesis of sp^3 bonded carbon nano materials by supercritical fluid plasma TOMOKI SHIZUNO, Graduate School of Frontier Sciences, The University of Tokyo, SVEN STAUSS, HIROYUKI MIYAZOE, SHO NAKAHARA, KOYA SAITO, MINORU SUZUKI, TAKEHIKO SASAKI, KAZUO TERASHIMA — We report the fabrication of nano diamond particles by supercritical fluids plasmas. Our aim is to synthesize molecular diamonds, which are expected to be applicable in a wide range of technical fields. For this, we generated dielectric barrier discharges in supercritical xenon (critical point: 16.6°C, 5.84 MPa) dissolving adamantane (5.0×10^{-2}g/cm^3). Raman spectroscopy measurements showed a peak at 1332 cm^{-1}, and it was found that more than 99% of the contained carbon atoms assume sp^3 bonds. Bright field TEM images showed grain sizes varying from 5 to 20 nm, and the observed lattice spacing was approximately 0.20 nm, corresponding the (111) lattice spacing of diamond. Also, the diffraction patterns were similar to that of diamond along the [110] zone axis. These results support the synthesis of nano diamond particles from adamantane.

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