



	<b>Experiment title:</b> Crystallization of cubic boron nitride from its solutions in supercritical ammonia at high pressures and temperatures. <i>In situ</i> studies	<b>Experiment number:</b> HS-1536
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**Report:**

Results are published in

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***In-situ* studies of boron nitride crystallization from BN solutions in supercritical N-H fluid at high pressures and temperatures. *Phys. Chem. Chem. Phys.* 2002, vol. 4, No. 21, pp. 5386-5393**

**Abstract.** A reaction of boron with products of thermal decomposition of hydrazine and crystallization of boron nitride from BN solutions in supercritical N-H fluid have been *in situ* studied at pressures up to 5.2 GPa and temperatures to 1600 K using angle- and energy-dispersive X-ray diffraction with synchrotron radiation. Graphite-like boron nitride produced by the reaction between boron and N-H supercritical fluid dissolves in the latter to form associated solutions of different concentrations. In cooling, the disappearance of short-range order in this solution is observed which is accompanied by the precipitation of solid phases (cBN or hBN and BN-NH<sub>3</sub> intercalation compound depending on the pressure, temperature and concentration). Spontaneous crystallization of cubic boron nitride has been observed down to 1.9±0.2 GPa, which is the lowest pressure of the cBN crystallization from a solution reported so far. The BN-NH<sub>3</sub> hypothetical quasibinary section of the phase diagram of the B-N-H system at 4 GPa has been constructed.