

Abstract Submitted  
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**High-pressure phase diagram of O<sub>2</sub> and N<sub>2</sub> binary system: formation of the kagome-lattice of O<sub>2</sub>** YUICHI AKAHAMA, TAKEO MAEKAWA, TOSHIYUKI SUGIMOTO, Graduate School of Material Science, University of Hyogo, HIROSHI FUJIHISA, National Institute of Advanced Industrial Science and Technology, NAOHISA HIRAO, YASUO OHISHI, Japan Synchrotron Radiation Research Institute — Recently, in the mixture of oxygen and nitrogen molecules, the appearance of a new solid phase, which does not occur for either pure component, has been reported under high pressure. We consider that the magnetic interaction of oxygen molecules would play a main role of the formation of the phase. In this paper, the high-pressure phase diagram of the binary system has been investigated by examining the x-ray diffraction patterns of the polycrystalline or powder samples. The solid phase was stable in a rather wide pressure and concentration range than previous report. From the Reitveld refinement the structure of the phase was identified to be a hexagonal structure with seven molecules in the unit cell. The results of x-ray diffraction, Raman scattering and magnetization measurements have suggested a magnetic order of oxygen molecules on the Kagome-lattice.

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