

Abstract Submitted  
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**High-pressure crystal growth and magnetic and electrical properties of the quasi-one dimensional osmium oxide  $\text{Na}_2\text{OsO}_4$**  Y.G. SHI, Y.F. GUO, S. YU, M. ARAI, A.A. BELIK, A. SATO, K. YAMAURA, E. TAKAYAMA-MUROMACHI, National Institute for Materials Science, Japan, T. VARGA, J.F. MITCHELL, Argonne National Laboratory —  $\text{Na}_2\text{OsO}_4$  crystals were grown by a NaCl flux method under high pressure. It was found that  $\text{Na}_2\text{OsO}_4$  crystallizes in the  $\text{Ca}_2\text{IrO}_4$ -type structure, which consists of  $\text{OsO}_6$  octahedra chains, rather than in the  $\text{K}_2\text{NiF}_4$ -type. A chain-magnetism was thus expected for the crystal because of the electronic configuration of  $\text{Os}^{6+}\text{O}_6$  ( $5d^2$ ,  $S = 1$ ). However, experimental data suggested the  $S = 0$  state for the crystal rather than the  $S = 1$  state. We carefully investigated the crystal to resolve the contradiction between the expectation and the observation, and found that the absence of the chain-magnetism is likely due to statically uniaxial compression of the  $\text{OsO}_6$  octahedra, resulting in splitting of the  $t_{2g}$  band. The localized 2 electrons per Os are probably paired in the  $t_{2g}$  band, forming the  $S = 0$  state. We will discuss details of the issue. This research was supported in part by the WPI Initiative on Materials Nanoarchitectonics from MEXT, Japan, and the Grants-in-Aid for Scientific Research (20360012) from JSPS. Work at Argonne National Laboratory supported under Contract No. DE-AC02-06CH11357 by UChicago Argonne, LLC, Operator of Argonne National Laboratory, a U.S. Department of Energy Office of Science Laboratory.

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