

Abstract Submitted
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Fe₄O₅: HP-HT synthesis and properties SERGEY V. OVSYANNIKOV, Bayerisches Geoinstitut, Universität Bayreuth, Germany, ALEXANDER A. TSIRLIN, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany, ALEXANDER E. KARKIN, VLADIMIR V. SHCHENNIKOV, Institute of Metal Physics, Russian Academy of Sciences, Yekaterinburg, Russia, ELENA BYKOVA, DMYTRO M. TROTS, ALEXANDER V. KURNOSOV, HUIYANG GOU, CATHERINE MCCAMMON, LEONID DUBROVINSKY, Bayerisches Geoinstitut, Universität Bayreuth, Germany — Recently, a new iron oxide, Fe₄O₅ has been synthesized at high-pressure high-temperature (HP-HT) conditions [1,2]. In this work using multi-anvil large-volume cells we investigated the synthesis conditions of Fe₄O₅ in wide ranges pressures of 9-24 GPa and temperatures of 900-1800 C. We have prepared both single crystals and bulk polycrystalline samples of Fe₄O₅. We investigated the chemical composition and the microstructure of Fe₄O₅. From a single-crystal diffraction study we have refined the crystal structure of Fe₄O₅. We have studied compressibility of Fe₄O₅ up to 50 GPa. In addition, we studied magnetic, optical and electronic transport properties of Fe₄O₅ at ambient pressure. These studies included magnetic susceptibility, magnetization, Mossbauer spectroscopy, Raman and Infra-red spectroscopy, electrical resistivity. We have performed also calculations of the lattice stability and electronic band structure of Fe₄O₅

[1] B. Lavina, et al., Proc Nat. Acad. Sci. US 108, 17281 (2011).

[2] A. B Woodland, et al., Am. Miner. 97, 1808 (2012).

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