High-Pressure Synthesis, Crystal Structure, and Properties of the New Orthorhombic Rare-Earth *meta*-Oxoborates $RE(BO_2)_3$ (RE = Dy - Lu)

Holger Emme^a, Tanja Nikelski^b, Thomas Schleid^b, Rainer Pöttgen^c, Manfred Heinrich Möller^c, and Hubert Huppertz^a

^a Department Chemie, Ludwig–Maximilians–Universität München, Butenandtstraße 5–13 (Haus D), D-81377 München, Germany

^b Institut für Anorganische Chemie der Universität Stuttgart, Pfaffenwaldring 55, D-70550 Stuttgart, Germany

^c Institut f
ür Anorganische und Analytische Chemie, Universit
ät M
ünster, Wilhelm-Klemm-Stra
ße 8, D-48149 M
ünster, Germany

Reprint requests to Dr. H. Huppertz. E-mail: huh@cup.uni-muenchen.de

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Dedicated to Professor Ingo-Peter Lorenz on the occasion of his 60th birthday

The new orthorhombic *meta*–oxoborates $RE(BO_2)_3$ ($\equiv REB_3O_6$) (RE = Dy-Lu) have been synthesized under high-pressure and high-temperature conditions in a Walker-type multianvil apparatus at 7.5 GPa and 1100 °C. They are isotypic to the known ambient pressure phase Tb(BO₂)₃, space group *Pnma*. In contrast to Dy(BO₂)₃, which was also obtained in small amounts under high-temperature conditions, the preparation of the higher orthorhombic homologues $RE(BO_2)_3$ (RE =Ho–Lu) was only possible using high-pressure. The *meta*-oxoborates $RE(BO_2)_3$ (RE =Dy–Er) were synthesized as pure products, whereas the orthorhombic phases with RE =Tm–Lu were only obtained as byproducts. With the exception of Yb(BO₂)₃ it was possible to establish single crystal data for all compounds. The results of temperature-resolved *in-situ* powder-diffraction measurements, DTA, IR-spectroscopic investigations, and magnetic properties are also presented.

Key words: High-Pressure, Oxoborates, Crystal Structure