High-pressure Syntheses, Crystal Structures, and Thermal Behaviour of β-$RE(BO_2)_3$ (RE = Nd, Sm, Gd)

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The compounds β-$RE(BO_2)_3$ [RE = Nd (neodymium *meta*-borate), Sm (samarium *meta*-borate) and Gd (gadolinium *meta*-borate)] were synthesized under high-pressure and high-temperature conditions in a Walker-type multianvil apparatus at 3.5 GPa (Nd), 7.5 GPa (Sm, Gd) and 1050 °C. The crystal structures were determined by single crystal X-ray diffraction data collected at r. t. (Sm, Gd) and at −73 °C (Nd), respectively. The structures are isotypic with the already known ambient-pressure phases β-$RE(BO_2)_3$ (RE = (Tb, Dy) and the high-pressure phases β-$RE(BO_2)_3$ (RE = Ho–Lu).

Key words: High-pressure Phases, Borates, Crystal Structure