The high-pressure phase $\beta$-ZrB$_2$O$_5$ represents the first ternary borate in the system Zr-B-O. The compound was synthesized under high-pressure / high-temperature conditions of 7.5 GPa and 1100 °C in a Walker-type multianvil apparatus. The crystal structure was determined on the basis of single crystal X-ray diffraction data, collected at room temperature. The monoclinic zirconium borate crystallizes in the space group $P2_1/c$ with the lattice parameters $a = 439.04(9)$, $b = 691.2(2)$, $c = 896.8(2)$ pm, and $\beta = 90.96(3)^\circ$. The structure is isotypic to the high-pressure phase $\beta$-HfB$_2$O$_5$, which is built up from layers of exclusively corner-sharing BO$_4$ tetrahedra. Between these layers, the cations are coordinated square-antiprismatically by eight oxygen atoms.

Key words: High Pressure, Crystal Structure, Multianvil, Borate, Gadolinite