Four new arsenides of rhodium and zinc were prepared by heating mixtures of the elements at high temperatures (1000–1200 °C) and investigated by single crystal X-ray methods. EuRh$_2$As$_2$ ($a = 4.067(1)$, $c = 11.319(2)$ Å) and BaRh$_2$As$_2$ ($a = 4.053(1)$, $c = 12.770(3)$ Å) crystallize with the well-known ThCr$_2$Si$_2$-type ($I4/mmm$; $Z = 2$). Due to the rigid layers of RhAs$_4$ tetrahedra, and to the atomic size of europium and barium, the As–As distances between the layers with values of 2.97 and 3.66 Å, respectively, are very long. SrRh$_2$As$_2$ is polymorphic and undergoes two phase transitions at about 190 and 282 °C. Main features of the three crystal structures are also layers of RhAs$_4$ tetrahedra. At room temperature α-SrRh$_2$As$_2$ ($a = 5.676(1)$, $b = 6.178(2)$, $c = 11.052(2)$ Å) probably crystallizes with the BaNi$_2$Si$_2$-type ($Cmcm$; $Z = 4$), whereas β-SrRh$_2$As$_2$ ($a = 5.760(3)$, $b = 6.067(4)$, $c = 11.264(5)$ Å, $Fmmm$, $Z = 4$) forms a new orthorhombically distorted variant of the ThCr$_2$Si$_2$-type. Single crystals grown in a flux of lead and quenched at high temperature show that the γ-phase ($a = 4.112(1)$, $c = 11.431(6)$ Å) crystallizes with the ThCr$_2$Si$_2$-type. The same is true for the high temperature modification of BaZn$_2$As$_2$ (β-phase; $a = 4.120(1)$, $c = 13.578(1)$ Å), whereas the already known α-BaZn$_2$As$_2$ forms the α-BaCu$_2$S$_2$-type ($Pnma$; $Z = 4$) consisting of a 3D-network of edge- and vertex-sharing ZnAs$_4$ tetrahedra with Ba atoms in the voids of this network.

**Key words:** Arsenide, Europium, Alkaline Earth Metal, Rhodium, Zinc, Crystal Structures