Crystal structures of ternary gadolinium silicides

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The crystal structure of $Gd_2Re_3Si_5$ was solved by direct methods in space group $P4/mnc$, using the SHELX-97 program package. The crystal structure of $Gd_2Pt_3Si_5$ was refined by the Rietveld method, using the CSD program package. The crystal structure of the ternary compound $Gd_2Re_3Si_5$ belongs to the structure type $U_2Mn_3Si_5$ ($tP40$, $P4/mnc$, a = 10.95564(13), c = 5.56326(11) Å, atom coordinates: Gd 8*h* 0.26249(5) 0.42271(5) 0; Re1 8*h* 0.14676(4) 0.12315(4) 0; Re2 4*d* 0 1/2 1/4; Si1 8*h* 0.0267(3) 0.3149(3) 0; Si2 8*g* 0.17183(18) 0.67183(18) 1/4; Si3 4*e* 0 0 0.2567(9)), whereas the crystal structure of $Gd_2Pt_3Si_5$ adopts the $U_2Co_3Si_5$ type ($oI40$, *Ibam*, a = 9.9224(2), b = 11.3997(2), c = 5.99300(9) Å, atom coordinates: Gd 8*j* 0.2671(2) 0.3717(3) 0; Pt1 8*j* 0.1122(2) 0.1374(2) 0; Pt2 4*b* 1/2 0 1/4; Si1 8*j* 0.356(1) 0.116(1) 0; Si2 8*g* 0 0.2710(9) 1/4; Si3 4*a* 0 0 1/4). The structures of $Gd_2Re_3Si_5$ and $Gd_2Pt_3Si_5$ can be described as arrangements of one-dimensional structural columns parallel to the crystallographic direction [001], also found in the structure type $CaBe_2Ge_2$.