**Appendix 2**

**Appendix 2** Calculated thermodynamic parameters for initial database

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Alloy** | |  | | --- | |  | | |  | | --- | |  | | **δ** | **∆χ** | **VEC** |
| TiVCrNb | -4.309 | 11.560 | 4.270 | 0.282 | 4.837 |
| Ti28V28Nb28Cr15 | -3.340 | 11.376 | 4.043 | 0.076 | 4.759 |
| TiVCrNbMo | -4.488 | 13.378 | 4.128 | 0.176 | 5.169 |
| TiVCrMo | -5.690 | 11.575 | 3.751 | 0.255 | 5.140 |
| TiVCrNbTa | -4.008 | 13.358 | 3.641 | 0.069 | 4.844 |
| (TiVNb)95.3Co4.7 | -8.591 | 10.945 | 3.433 | 0.055 | 4.739 |
| (TiVNb)96.2Ni3.8 | -4.267 | 10.676 | 4.075 | 2.083 | 5.757 |
| Ti0.325V0.275Zr0.125Nb0.275 | -0.570 | 11.169 | 5.312 | 0.100 | 4.520 |
| TiVZrNb | -0.196 | 11.556 | 6.225 | 0.110 | 4.495 |
| TiVZr1.20Nb | -0.938 | 11.859 | 5.207 | 0.089 | 4.521 |
| TiVZr1.50Nb | -0.877 | 11.583 | 6.077 | 0.108 | 4.455 |
| TiVZr1.75Nb | -1.288 | 12.320 | 5.983 | 0.110 | 4.500 |
| TiVZr2Nb | -0.601 | 11.661 | 6.099 | 0.104 | 4.440 |
| TiZrNbMoV | -2.716 | 13.380 | 5.870 | 0.254 | 4.801 |
| TiVZrHfNb0.5 | -0.842 | 13.599 | 5.956 | 0.131 | 4.423 |
| TiVZr0.5HfNb | -0.450 | 13.219 | 6.202 | 0.136 | 4.409 |
| TiVZrHf0.5Nb | -1.039 | 13.170 | 6.380 | 0.126 | 4.463 |
| TiV0.5ZrHfNb | -0.413 | 13.151 | 5.877 | 0.128 | 4.423 |
| Ti0.5VZrHfNb | -0.546 | 13.134 | 5.999 | 0.129 | 4.434 |
| TiVZrHfNb | 0.045 | 13.380 | 6.041 | 0.137 | 4.401 |
| Ti0.30 V0.25Zr0.10 Nb0.25Ta0.10 | -0.314 | 11.365 | 5.190 | 0.100 | 4.578 |
| TiVZr0.15NbTa0.85 | -0.178 | 12.091 | 5.138 | 0.863 | 4.527 |
| TiVZr0.50NbTa0.50 | 0.301 | 12.581 | 4.858 | 0.862 | 4.522 |
| TiVZr0.74NbTa0.26 | 1.875 | 12.378 | 4.111 | 1.354 | 4.490 |
| TiVZrHf | -2.547 | 11.874 | 4.924 | 0.125 | 4.322 |
| TiVNbMo | -2.765 | 11.576 | 3.092 | 0.182 | 5.000 |
| TiVHfNb | -0.280 | 11.753 | 5.283 | 0.098 | 4.382 |
| TiVNbHf | -0.280 | 11.753 | 5.283 | 0.098 | 4.382 |
| TiVNbTa | -0.420 | 11.521 | 3.758 | 0.123 | 4.711 |
| TiZrHfMoNb | -2.216 | 13.380 | 4.851 | 0.269 | 4.601 |
| Ti0.20Zr0.20Hf0.20Nb0.40 | 1.407 | 11.893 | 4.885 | 0.110 | 4.461 |
| TiZrNbHf | 2.462 | 11.549 | 3.790 | 0.116 | 4.263 |
| TiZrNbHfTa | 2.718 | 13.380 | 3.913 | 0.115 | 4.402 |
| TiZrNbTa | 2.486 | 11.525 | 4.221 | 1.937 | 4.480 |
| Ti0.20Zr0.20Hf0.20 Mo0.10Nb0.30 | -1.623 | 12.747 | 4.481 | 0.256 | 4.500 |
| Ti0.20Zr0.20Hf0.20 Mo0.20Nb0.20 | -2.216 | 13.380 | 4.851 | 0.269 | 4.601 |
| Ti0.20Zr0.20Hf0.20 Mo0.30Nb0.10 | -2.771 | 13.161 | 11.553 | 0.383 | 4.575 |
| Ti0.20Zr0.20Hf0.20 Mo0.40 | -4.881 | 12.968 | 10.077 | 0.333 | 4.586 |
| VZrHfNb | -0.345 | 10.382 | 5.716 | 0.132 | 4.407 |
| Ti0.32V0.32Cr0.05Nb0.32 | -1.094 | 10.665 | 3.190 | 0.050 | 4.643 |
| Ti0.32V0.32Ni0.04Nb0.32 | -7.372 | 10.480 | 3.215 | 0.058 | 5.617 |
| Ti0.24V0.24Zr0.28Nb0.24 | -0.839 | 12.113 | 5.264 | 0.091 | 4.511 |
| Ti0.22V0.22Zr0.33Nb0.22 | -0.540 | 12.130 | 5.981 | 0.113 | 4.503 |
| Ti0.21V0.21Zr0.37Nb0.21 | -1.240 | 12.320 | 5.983 | 0.110 | 4.499 |
| Ti0.3V0.25Zr0.1Nb0.25Ta0.1 | -0.314 | 11.365 | 5.190 | 0.100 | 4.578 |
| Ti0.2Zr0.2Nb0.2Mo0.2Hf0.2 | -2.216 | 13.380 | 4.851 | 0.269 | 4.601 |
| Ti0.3Zr0.2Nb0.2Hf0.2 | 0.816 | 11.706 | 4.770 | 0.117 | 4.341 |
| Ti0.2Zr0.2Nb0.3Mo0.1Hf0.2 | -1.623 | 12.747 | 4.481 | 0.256 | 4.500 |
| Ti0.2Zr0.2Nb0.1Mo0.3Hf0.2 | -2.771 | 13.161 | 11.553 | 0.383 | 4.575 |
| Ti0.2Zr0.2Mo0.4Hf0.2 | -4.881 | 12.968 | 10.077 | 0.333 | 4.586 |
| Mg0.20Al0.20Ti0.20Fe0.20Ni0.20 | -19.091 | 13.488 | 7.145 | 0.163 | 6.362 |
| Mg0.20Al0.20V0.20Cr0.20Ni0.20 | -6.742 | 12.879 | 7.047 | 0.193 | 4.536 |
| Mg0.28Al0.19V0.28Cr0.19Ni0.06 | -6.253 | 11.177 | 5.901 | 0.402 | 4.022 |
| Mg0.26Al0.31V0.31Cr0.06Ni0.06 | -6.414 | 10.547 | 6.800 | 0.297 | 3.980 |
| Mg0.20Ti0.20V0.20Cr0.20Fe0.20 | -7.866 | 13.186 | 6.750 | 0.136 | 6.017 |
| Mg0.10Ti0.30V0.25Zr0.10Nb0.25 | -1.213 | 11.498 | 5.971 | 0.124 | 3.589 |
| Mg0.22Ti0.22Cr0.11Mn0.11Nb0.22 | -3.205 | 12.744 | 5.436 | 0.148 | 3.787 |
| Mg0.22Ti0.22Cr0.11Mn0.11Ni0.11Nb0.22 | -10.126 | 13.119 | 6.086 | 0.188 | 3.918 |
| Mg0.22Ti0.22Fe0.11Co0.11Ni0.11Zr0.22 | -24.877 | 16.226 | 7.164 | 0.172 | 6.087 |
| Mg0.22Ti0.22Fe0.11Co0.11Ni0.11Zr0.22 | -24.877 | 16.226 | 7.164 | 0.172 | 6.087 |
| Al0.17Cr0.17Mn0.17Fe0.17Ni0.17W0.17 | -11.482 | 14.697 | 4.677 | 0.177 | 7.020 |
| Ti0.17V0.17Cr0.17Fe0.17Ni0.17Zr0.17 | -19.921 | 14.898 | 8.563 | 0.169 | 6.333 |
| Ti0.20Fe0.40Ni0.15Zr0.20Nb0.05 | -14.469 | 11.866 | 5.787 | 0.135 | 6.789 |
| Ti0.20Fe0.40Ni0.20Zr0.20Nb0.20 | -14.226 | 11.946 | 5.584 | 0.134 | 6.797 |
| V0.20Mn0.20Fe0.40Ni0.20La0.20 | -5.344 | 11.002 | 3.247 | 0.113 | 7.688 |
| TiZrHfMoNb | -2.216 | 13.380 | 4.851 | 0.269 | 4.601 |
| Ti35V35Nb20Cr5Mn5 | -1.687 | 12.549 | 3.649 | 0.072 | 4.742 |
| Ti32V32Nb18Cr9Mn9 | -2.748 | 12.523 | 3.590 | 0.086 | 4.810 |
| Ti27.5V27.5Nb20Cr12.5Mn12.5 | -3.642 | 12.776 | 3.605 | 0.105 | 5.113 |
| TiZrVMoNb | -2.716 | 13.380 | 5.870 | 0.254 | 4.801 |
| Ti15V35(CrMnFe)50 | -4.674 | 11.854 | 3.262 | 0.100 | 5.335 |
| TiZrHfMoNb | -2.216 | 13.380 | 4.851 | 0.269 | 4.601 |
| V0.3Ti0.3Cr0.25Mn0.1Nb0.05 | -4.847 | 12.482 | 4.035 | 0.298 | 4.913 |
| Ti0.30V0.25Zr0.10Nb0.25Mo0.10 | -2.271 | 12.228 | 5.684 | 0.207 | 4.660 |
| MgZrTiFe0.5Co0.5Ni0.5 | -21.764 | 13.373 | 6.599 | 0.144 | 6.410 |
| Ti0.20Zr0.20Hf0.20Nb0.40 | 1.407 | 11.893 | 4.885 | 0.110 | 4.461 |
| AlCrFeMnNiW | -11.482 | 14.697 | 4.677 | 0.177 | 7.020 |
| TiFe0.8Mn0.2Zr0.05 | -6.781 | 13.872 | 5.425 | 0.141 | 5.483 |
| TiFe0.8Mn0.18Al0.02Zr0.05 | -11.806 | 13.103 | 5.426 | 0.145 | 5.401 |
| TiFe0.8Mn0.18Al0.05Zr0.02 | -6.887 | 13.103 | 5.342 | 0.145 | 5.453 |
| TiFe0.8Mn0.2V0.05 | -5.383 | 14.024 | 3.462 | 0.107 | 5.500 |
| TiCo0.5Mn0.5V0.05 | -14.979 | 12.121 | 4.079 | 0.105 | 5.412 |
| TiCo0.5Mn0.5Zr0.05 | -22.393 | 12.034 | 5.591 | 0.136 | 5.545 |
| TiCo0.5Fe0.5V0.05 | -14.977 | 12.148 | 4.286 | 0.107 | 5.849 |
| TiCo0.5Fe0.5Zr0.05 | -22.393 | 12.056 | 5.751 | 0.132 | 5.876 |
| Ti0.2V0.2Nb0.2Zr0.4 | -1.309 | 12.339 | 5.816 | 0.109 | 4.498 |
| Mg21Ti31Nb31Ni17 | -8.696 | 10.675 | 4.768 | 0.128 | 4.442 |
| FeMnNiCoCr | -4.175 | 13.380 | 1.841 | 0.134 | 7.999 |
| Ti25V25Nb25Zr25 | -0.196 | 11.556 | 6.225 | 0.110 | 4.495 |
| TiVZrNbNi | -14.785 | 13.380 | 7.180 | 0.129 | 6.107 |
| TiVZrNbHf | 0.045 | 13.380 | 6.041 | 0.137 | 4.401 |
| (TiVNb)30Cr70 | -2.977 | 10.948 | 2.870 | 0.086 | 4.574 |
| (TiVNb)65Cr35 | -3.159 | 10.503 | 3.620 | 0.081 | 4.558 |
| TiVZrNbFe | -2.034 | 13.282 | 5.543 | 0.136 | 6.231 |
| Mg0.68TiNbNi0.55 | -10.497 | 11.136 | 7.047 | 0.147 | 4.939 |