Cvičení 1

**Termodynamická data**

Robie R. A., Hemingway B. S. (1995): Thermodynamic properties of minerals and related substances at 298.15 K and 1 bar (10^5 pascals) pressure and at higher temperatures. Bulletin 2131, USGS. 461 s.

**1. Který ze stavů Fe a O bude nejstabilnější?**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *H* | *S* | *G* | *V* |  | *c*p | *M* | hustota |
|  | kJ/mol | J/K mol | kJ/mol | cm3 |  | J/K mol | g/mol | g/cm3 |
| Fe | 0 | 27.09 | 0 | 7.092 |  |  | 55.847 |  |
| O2 | 0 | 205.15 | 0 | 24789.7 |  |  | 31.999 |  |
| FeO | -272 | 60.6 | -251.4 | 12 |  |  | 71.846 |  |
| Fe2O3 | -826.2 | 87.4 | -744.4 | 30.27 |  |  | 159.692 |  |
| Fe3O4 | -1115.7 | 146.1 | -1012.7 | 44.52 |  |  | 231.539 |  |

**2. Vypočítejte bod tání a bod varu H2O. K dispozici jsou následující termodynamické údaje:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| fáze | *H* | *S* | *G* | *V* |  | *c*p | *M* | hustota |
|  | kJ/mol | J/K mol | kJ/mol | cm3 |  | J/K mol | g/mol | g/cm3 |
| led | -291.84 | 48.06 | -236.62 | 19.65 |  | 37.89 | 18.015 | 0.917 |
| voda | -285.83 | 69.91 | -237.13 | 18.07 |  | 75.19 | 18.015 | 0.997 |
| pára | -241.82 | 188.83 | -228.57 | 24789 |  | 33.58 | 18.015 | 0.00073 |

**3. Která z polymorfních modifikací CaCO3 bude stabilní za povrchových podmínek a při jaké teplotě budou v rovnováze?**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| fáze | *H* | *S* | *G* | *V* |  |  | M | hustota |
|  | J/mol | J/mol K | J/mol | cm3/mol |  |  | g/mol | g/cm3 |
| kalcit | -1207370 | 91.71 | -1128842 | 36.93 |  |  | 100.087 | 2.71 |
| aragonit | -1207430 | 87.99 | -1127793 | 34.16 |  |  | 100.087 | 2.93 |