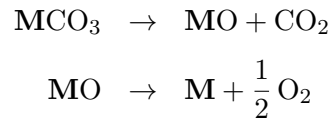


Q4001 Thermodynamics of Materials
Homework 7

September, 2019

For this homework you have to describe the thermal stability of a carbonate and the produced oxide, i.e.



where $\text{M} \equiv \text{Mg, Mn, Co, Fe or Zn}$.

Find the thermodynamic data to calculate and plot the values of $\Delta_{\text{rxn}}G$ as a function of temperature to determine:

- a)* The temperatures at which the reactions above are expected to occur spontaneously.
- b)* The phase transformations of the metal (and oxide) that may occur in the temperature range considered.
- c)* Calculate the partial pressures for CO_2 for the carbonate and of O_2 for the oxide at 25 °C. Plot the partial pressures for CO_2 for the carbonate and of O_2 for the oxide as function of temperature. For this graph, plot $\ln P$ vs. $1/T$.

Due date: Tuesday, October 1st.