Quiz 3.3 – Gibbs Energy and T

Name: _____

The Equilibrium Temperature

In CHEM 1220 you learned that $\Delta G = \Delta H - T\Delta S$, and used this formula to calculate the equilibrium temperature: $T = \dfrac{\Delta H}{\Delta S}$. That formula relies on the assumption that ΔH and ΔS are both independent of temperature, which is only a good approximation over very small temperature ranges.

Consider the Haber-Bosch process: $3\,H_2(g) + N_2(g) \rightleftharpoons 2\,NH_3(g)$

At $298\ K$ this reaction has $\Delta_{rxn}G^{\ominus} = \dfrac{kJ}{mol}$, $\Delta_{rxn}H = -92.28\dfrac{kJ}{mol}$, and $\Delta_{rxn}S = \dfrac{J}{mol\ K}$

The New Colossus

By Emma Lazarus

Not like the brazen giant of Greek fame,
With conquering limbs astride from land to land;
Here at our sea-washed, sunset gates shall stand
A mighty woman with a torch, whose flame
Is the imprisoned lightning, and her name
Mother of Exiles. From her beacon-hand
Glows world-wide welcome; her mild eyes command
The air-bridged harbor that twin cities frame.
"Keep, ancient lands, your storied pomp!" cries she
With silent lips. "Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest-tost to me,
I lift my lamp beside the golden door!"