

GL 211

Mineralogy
Phase Diagram Assignment

Spring 1999

Use the following the thermodynamic data to construct a phase diagram for aragonite and calcite using the equilibrium equation:

Aragonite Calcite

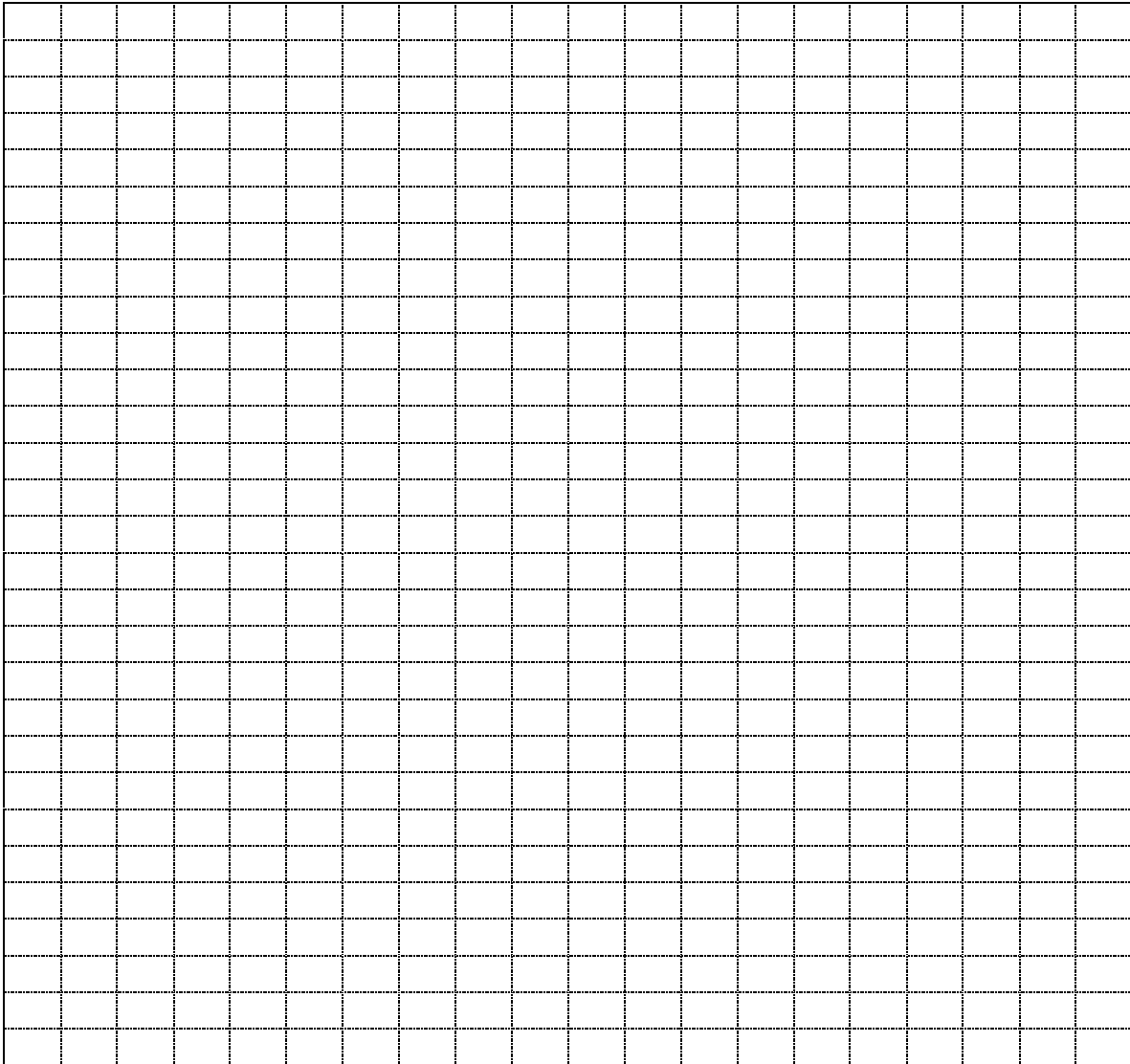
	H ⁰ (cal/mole)	S ⁰ (cal/deg-mole)	G ⁰ (cal/mole)	V ⁰ (cm ³ /mole)
Calcite	-288.6	22.15	-269,908	36.93
Aragonite	-288.7	21.18	-269,678	34.15

⁰ indicates data is at standard temperature and pressure (298⁰K and 1 bar). 1 cal = 41.8 bar-cm³.

Hint: use the following equations:

$$(1) \quad \frac{dP}{dT} = \frac{S_{298}^0}{V_{298}^0}$$

$$(2) \quad G_{298}^P = G_{298}^0 + P V_{298}^0$$



N.B. Plot Pressure in kilobars (range 0 to 15) on the Y-axis, and Temperature in $^{\circ}\text{C}$ (range 0 to 800) on the X-axis. Note also that $^{\circ}\text{C} = ^{\circ}\text{K} - 273$.