EPSC 220: Principles of Geochemistry
Laboratory 1

Group 1

Solve the following equation for x:

$$3x^3+2x^2+5x-37.2 = 0$$

Using the attached data calculate the ΔH, ΔS, and ΔG of the following reaction at 1 bar, 298 K:

$$C^{diamond} \Leftrightarrow C^{graphite}$$

Group 2

Integrate the following equation from 1 to 100 using both numerical methods (e.g., Scilab) and analytically using integration by parts:

$$\ln(x) + 3x^2 + 2x - 5=0$$

Using the attached data calculate the ΔH, ΔS, and ΔG of the following reaction at 1 bar, 298 K:

$$NaAlSi_3O_8^{plagioclase} \Leftrightarrow NaAlSi_2O_6^{clinopyroxene} + SiO_2^{quartz}$$

Group 3

Using Newton's method find the solution of

$$5\ln(x) + 6\ln(x^2)-3x + 7 = 0$$

Using the attached data calculate the ΔH, ΔS, and ΔG of the following reaction at 1 bar, 298 K:

$$Mg_2SiO_4^{olivine} + SiO_2^{quartz} \Leftrightarrow 2MgSiO_3^{orthopyroxene}$$

Group 4

Find the solution to the following set of equations

$$2x + 4y - 7z = 0.4482643$$
$$3x + 7y + 1.5z = 31.445008$$
$$x + y - z = 2.8390049$$

Using the attached data calculate the ΔH, ΔS, and ΔG of the following reaction at 1 bar, 298 K:

$$CaCO_3^{aragonite} \Leftrightarrow CaCO_3^{calcite}$$

NOTE: DATA NOT ATTACHED DUE TO COPYRIGHT RESTRICTIONS