CHEM 361

Name _____

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Assignment 39 - (OUT OF 30 PTS)

Complete this assignment by working with your classmates. Please hand in one paper per group. The assignment must be handed in by the end of class. It will be graded on effort, as well as results.

1. Determine ΔS(system) for 100.0 g of supercooled liquid water at -10.0°C freezing to form ice at -10.0°C.
For water, $\Delta_{fus}H_{273} = 6.0095$ kJ/mol and $C_{P,m} = 75.3$ J/mol•K for liquid water and 38.0 J/mol•K for ice.

2. Should $\Delta_r S^{\varnothing}$ be large and positive, large and negative, or small for the following chemical reaction? Explain.

$$NaHCO_3(s) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l) + CO_2(g)$$

Confirm your prediction by calculating $\Delta_r S^{\varnothing}$ for the equation using the $S^{\varnothing}$ data given in the text.
$S^{\varnothing}$ [$NaHCO_3(s)$] = 101.7 J/mol•K