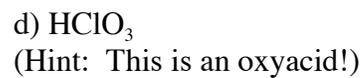


Chem E-1a
Friday Review Problems
Chapter 9: Chemical Bonding I

1. Draw Lewis Structures for the following molecules/ions. Include non-zero formal charges and show resonance if appropriate.



e) XeF₄

f) AlCl₃

g) I₃⁻

h) NO

2. Construct a Born-Haber cycle for NaNO_2 to determine the electron affinity of NO_2 .

Useful information:

$$\Delta H_f(\text{NaNO}_2(\text{s})) = -359 \text{ kJ/mol}$$

$$\Delta H_{\text{sub}}(\text{Na}) = 108 \text{ kJ/mol}$$

$$\Delta H_f(\text{NO}_2(\text{g})) = +33.2 \text{ kJ/mol}$$

$$\text{IE}(\text{Na}) = 496 \text{ kJ/mol}$$

$$\text{L.E.}(\text{NaNO}_2) = 777 \text{ kJ/mol}$$

3. Draw the Lewis structure for BrF_3 and then use the following information to determine the enthalpy of formation (ΔH°_f) for liquid BrF_3 .

$$D_{\text{Br-Br}} = 193 \text{ kJ/mol}$$

$$D_{\text{F-F}} = 155 \text{ kJ/mol}$$

$$D_{\text{Br-F}} = 237 \text{ kJ/mol}$$

$$\Delta H_{\text{vap}}(\text{Br}_2(\text{l})) = 30.71 \text{ kJ/mol}$$

$$\Delta H_{\text{vap}}(\text{BrF}_3) = 47.6 \text{ kJ/mol}$$

3. (cont. – space for additional work)