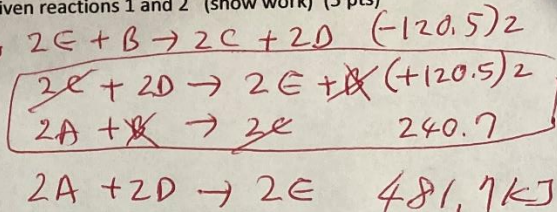
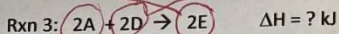
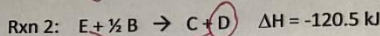
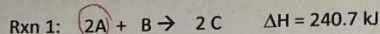


Quiz 4: Chapter 4 Dr. Hahn Greenville Tech 3/16/21 Print Name Key
 Show work for all questions for partial and full credit. (25 pts total)

1. Use Hess's Law to calculate the ΔH for reaction 3 given reactions 1 and 2 (show work) (5 pts)



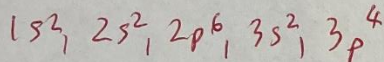
2. Given $\lambda = 620.2 \text{ nm}$, what is the frequency ($c = \lambda \nu$) (show work) (5 pts)

$1 \text{ nm} = 10^{-9} \text{ m}$ $\lambda = 620.2 \text{ nm}$ $\nu = c/\lambda$

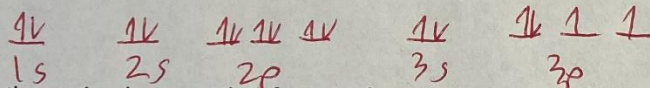
$c = \text{speed of light} = 3.00 \times 10^8 \text{ m/s}$

$\nu = \frac{3.00 \times 10^8 \text{ m/s}}{620.2 \text{ nm} \times 10^{-9} \text{ m/nm}} = 4.84 \times 10^{14} \text{ Hz}$

3. a. Give the electron configuration for the element S using the notation $1s^2, 2s^2, \dots$ (5 pts)

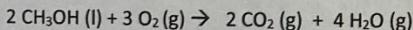


b. Give the orbital diagram for the element S using lines for orbitals (label your lines to illustrate which orbitals the lines represent). $\uparrow \downarrow$ \uparrow \dots (5 pts)



4. For the reaction shown, use the information for test 3 charts to calculate ΔH° (show work) (5 pts)

[for generalized reaction $aA + bB \rightarrow cC + dD$ $\Delta H^\circ = \{c \cdot \Delta H_f^\circ(C) + d \cdot \Delta H_f^\circ(D)\} - \{a \cdot \Delta H_f^\circ(A) + b \cdot \Delta H_f^\circ(B)\}$] useful info



$\Delta H = [2 \Delta H_f^\circ(\text{CO}_2(\text{g})) + 4 \Delta H_f^\circ(\text{H}_2\text{O}(\text{g}))] - [2 \Delta H_f^\circ(\text{CH}_3\text{OH}(\text{l})) + 3 \Delta H_f^\circ(\text{O}_2(\text{g}))]$
 $\Delta H = [2(-393.5) + 4(-241.826)] - [2(-238.6) + 3(0)] = [(-1787.23) + (-967.324)] - [-477.2 + 0] = (-1754.55 + 477.2) = -1277.35 \text{ kJ}$

Extra Credit (discussed in 3/16 class) Which of the following is larger (size, first ionization energy, electron affinity)? Fill in the blank with the larger element symbol. (4 pts, 1/2 pt each, 1/2 pt free)

N or Ne larger size N larger ionization energy Ne larger electron affinity Ne

F or I larger size I larger ionization energy F

N or N³⁻ larger size N³⁻

Mg or Mg²⁺ larger size Mg

