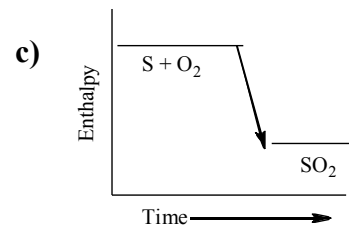
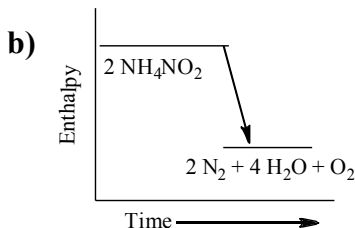
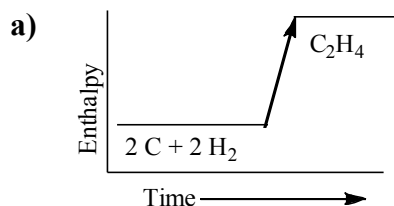


1) Are the following reactions exothermic or endothermic?

- _____ a) $C_2H_4 \rightarrow 2 C + 2 H_2 + 52.3 \text{ kJ}$
 _____ b) $2 Fe + 3 CO_2 + 26.8 \text{ kJ} \rightarrow Fe_2O_3 + 3 CO$
 _____ c) $S_2Cl_2 + CCl_4 \rightarrow CS_2 + 3 Cl_2 \quad \Delta H = +112 \text{ kJ}$
 _____ d) $BCl_3 + 3 H_2O \rightarrow H_3BO_3 + 3 HCl \quad \Delta H = -112 \text{ kJ}$

2) Label each energy diagram as representing either an **exothermic** or **endothermic** reaction.



3) How much heat will be absorbed if 27.1 g of I_2 reacts with excess H_2 according to the following equation?



4) Entropy is the measure of _____

5) Determine whether entropy is increasing or decreasing for each of these changes.

- _____ a) dry ice sublimates : $CO_2(s) \rightarrow CO_2(g)$
 _____ b) salt crystallizes out of solution: $NaCl(aq) \rightarrow NaCl(s)$
 _____ c) mercury vapor condenses: $Hg(g) \rightarrow Hg(l)$
 _____ d) water boils
 _____ e) a large starch molecule is digested and broken down into small sugar molecules
 _____ f) $Cl_2(g) + 2 Na(s) \rightarrow 2 NaCl(s)$

6) A favorable enthalpy change occurs in an (**endothermic, exothermic**) reaction.

7) A favorable entropy change occurs when the entropy (**increases, decreases**).

8) A spontaneous reaction is a reaction that _____

9) Fill in the chart for the following reactions.

Reactions	ΔH + or -	Is enthalpy favorable?	ΔS + or -	Is entropy favorable?	Spontaneous? (yes, no or depends)
a) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$ (Endo)					
b) $2 NF_3(l) \rightarrow N_2(g) + 3 F_2(g)$ (Exo)					
c) $2 XeO_3(s) \rightarrow 2 Xe(g) + 3 O_2(g)$ (Exo)					
d) $NH_4NO_3(s) + \text{water} \rightarrow NH_4NO_3(aq)$ (Endo)					
e) $NaCH_3COO(aq) \rightarrow NaCH_3COO(s)$ (Exo)					