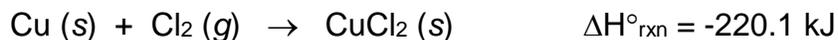


**Group Assignment (“Quiz 6”) – Oct. 23, 2019**

1. (12 pts) The following questions relate to intermolecular forces (IMF).
- a. Which of the following pure substances contain **dipole-dipole** forces? Please circle all that apply.
- H – F                      O = C = O                      BF<sub>3</sub> (trigonal planar geom.)
- b. Please **diagram** the **hydrogen-bonding** interactions that take place in a sample of ammonia, NH<sub>3</sub>.
- c. Does hydrogen bonding occur in PH<sub>3</sub> (which has the same structure)? If not, why not?
- d. Based on your answer in (c), which do you expect to have the **higher boiling point**, NH<sub>3</sub> or PH<sub>3</sub>? Explain briefly.

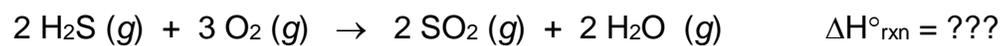
2. (6 pts) The questions below relate to the following thermochemical equation:



- a. Is the reaction **endothermic or exothermic**? Is heat **absorbed or released**?
- b. According to the reaction above, how much heat (in kJ) would be absorbed or released in the formation of 4 moles of CuCl<sub>2</sub>?
- c. What is the value of  $\Delta H^\circ_{\text{rxn}}$  for the following reaction? [Note that you need **not** answer (b) in order to answer this question.]



3. (7 pts) Use the standard enthalpies of formation provided below to determine  $\Delta H^\circ_{\text{rxn}}$  for the following reaction:



Substance	$\Delta H^\circ_f$ (kJ/mol)
$\text{H}_2\text{S} (g)$	-20.17
$\text{SO}_2 (g)$	-296.8
$\text{H}_2\text{O} (g)$	-241.8
$\text{O}_2 (g)$	0

**(LOTS of extra room here!!)**