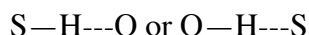


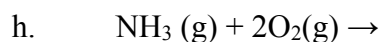
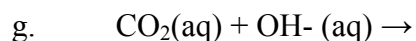
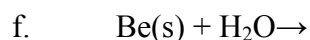
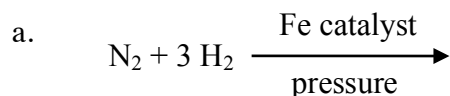
HW 11
CHEM 362

Due: December 3, 2019

1. What is the difference between a hydrate and a clathrate?
2. a) When an H bond is symbolized as X—H ---Y, what do the solid and dashed lines mean? Which distance is shorter?
b) Which H bond would you expect to be stronger and why?



3. Give the product(s) for the following reactions



4. Water has several interesting properties that are needed for life as we know it. Three of these were discussed in class. List them and *briefly* mention why each is needed for life.

5. Rank the following ions in terms of their hydration enthalpy, and explain *why*



6. Why are Na^+ and K^+ important physiologically?

7. Draw the structure of
 - i) a crown ether
 - ii) a cryptate.

Be sure to give the correct name for the structures you drew
8. Do the alkaline earth cations form many complexes? Which cations tend to do so and what are the best ligands (complexing agents)?
9. Explain the roles of CO and CO₂ in the environment. Be as complete as possible in your response. (ie. How are they formed? What physiological and/or environmental effects do they have?)
10. Use MO theory to compare and contrast the bonding in CO, N₂, CN⁻ and NO⁺. Why does N₂ form complexes with metals much less than CO? (*this is review but is being re-emphasized in this section*)