CHEM106 Quiz 1
Please show all equations, all substitutions, all units, and all work to receive any credit

1. Draw the complete Lewis structures (include all nonzero formal charges and total charges) for:
   $H_2PO_4^-$ XeF_4 CCl_3COOH

2. A catalyzed reaction has an activation energy of 80 kJ/mole.
   a. At a temperature of 298 K, calculate the fraction of molecules with sufficient energy to react.

   b. Identify two ways that the speed of this reaction could be increased; for each case, draw and clearly label a kinetic energy distribution diagram and fully explain the fundamental reasons for why the reaction would occur faster.

3. Compare the vapor pressures for these three pure substances: CH_4, H_2O and $NaCl$. For each substance clearly explain the scientific basis for that attractions that affect vapor pressure. For each, provide clearly labeled diagrams that illustrate the basis for each of these attractions

4. Ethanol has a log P value of -0.235.

   a. Both explicitly define and diagram what P is; then calculate the value of P for ethanol.

   b. For an ethanol concentration of 0.05 mM in the water phase, calculate the concentration of ethanol in the 1-octanol phase.