

- List three differences between prokaryotes and eukaryotes. Lots of possibilities – here are a few
 - Prokaryotes don't have organelles
 - Prokaryotes do not organize beyond single cells
 - Eukaryotes protect their genetic information in a nucleus.
- In your own words, define the first and second laws of thermodynamics
 - Energy must be conserved
 - Everything wants to be disordered
- What is the difference between an exothermic and exergonic reaction.
Exothermic \rightarrow negative ΔH Exergonic \rightarrow negative ΔG
- Why have biochemists defined their own standard-state convention for thermochemical data? The standard state convention assumes 0 °C and 1.00 M concentrations of everything. This is not realistic under biological conditions. Life didn't evolve to be efficient at 0 °C and very few molecules will ever reach concentrations of 1 M *in vivo*.
- Look at Problem 1 in Chapter 1. Match the functional group or linkages with the appropriate letter.
 - Thiol
 - Carbonyl
 - Amide
 - Phosphoanhydride
 - Phosphate
 - Alcohol
- Is dihydrogen phosphate a stronger or weaker acid than ammonium? H_2PO_4^- pKa = 6.82 NH_4^+ pKa = 9.25
lower pKa = stronger acid $\rightarrow \text{H}_2\text{PO}_4^-$
- Name one molecule that is amphiphilic. Lots of possibilities - any fatty acid would work
- Read Question 12 in Chapter 2. What is the molecular form of ammonia that predominates in the blood?
With a pK value of 9.25, ammonia exists in the blood (pH 7.4) as NH_4^+
- Still from question 12 - Could this molecule easily diffuse through the hydrophobic lipid membrane of a kidney cell? Explain. The ammonium ion is charged, so it will not easily diffuse across a hydrophobic membrane.