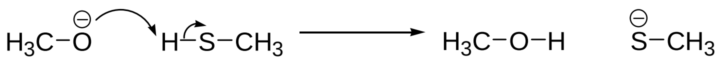
Organic Chemistry 1 – Spring 2010
Worksheet for Jacquie's recitation
Week of 2/1/10 - KEY



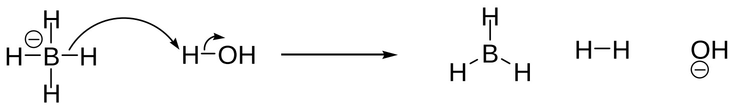
a) Base pKa = 15.2 Acid pKa = 10.7

Proton transfer occurs, so it's a Bronsted-Lowry or acid-base reaction. By the way, the book doesn't give exact numbers for either of these molecules so just picking any number out of the relevant range is fine.

pKeq = pKa (final base) – pKa(initial base)= 10.7 - 15.2 = -4.5

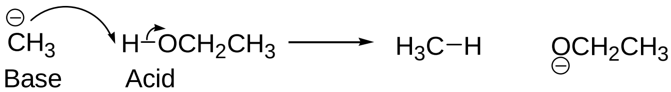
Keq = 10^{-pKeq} = $10^{4.5}$

This is greater than one, so it favors products.



b) Base Acid

Proton transfer occurs, so it counts as Bronsted-Lowry. To figure out the pKeq, you would need the pKa of BH_4^-, but this is normally not given because the molecule has to split up into BH_3 and H^- first. So really H^- is acting as the base, and its pKa is normally around 35, but changes significantly under different conditions.



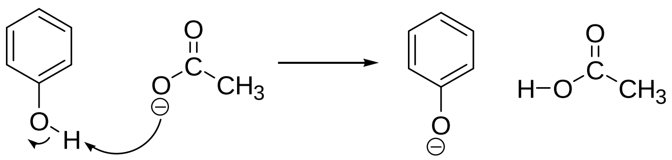
c) Base pKa = 60 Acid pKa = 15.5

Proton transfer occurs, so it's a Bronsted-Lowry or acid-base reaction. Again, the book doesn't give exact numbers for one of these molecules so just picking any number out of the relevant range is fine.

pKeq = pKa (final base) – pKa(initial base)= 15.5 - 60 = -44.5

Keq = 10^{-pKeq} = $10^{44.5}$

This is greater than one, so it favors products.



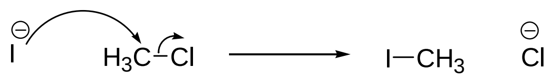
d) Acid pKa = 10 Base pKa = 4.7

Proton transfer occurs, so it's a Bronsted-Lowry or acid-base reaction.

pKeq = pKa (final base) – pKa(initial base)= 10 – 4.7 = 5.3

Keq = 10^{-pKeq} = $10^{-5.3}$

This is less than one, so it favors reactants.



e) Nu E