

## Lecture 6: Polarity and Resonance

## WOW Your Neighbors

1. In the comparisons below, circle the strongest acid. Discuss among yourselves your reasons for choosing the answer.

$\text{H}_2\text{O}$  or  $\text{H}_2\text{S}$   $\text{S}^-$  much larger than  $\text{O}^-$ , conjugate base more stable

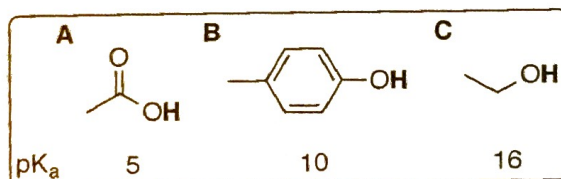
$\text{F}_3\text{C}-\text{COOH}$  or  $\text{Cl}_3\text{C}-\text{COOH}$  stronger inductive effect as F more electronegative than Cl.

2. In the comparisons below, circle the strongest base. Discuss among yourselves your reasons for choosing the answer.

$\text{C}_6\text{H}_5^-$  or  $\text{C}_6\text{H}_{11}^-$  resonance structures stabilize anion in first structure, making it a weaker base

$\text{NH}_3$  or  $\text{CH}_3\text{NH}_2$  C-N bond is polarized, donating electron density to nitrogen, making it a stronger base

3. Compound A is the strongest acid. Explain the trend in acidity of the hydrogen in bold.



A  $\left[ \text{CH}_2\text{COO}^- \leftrightarrow \text{CH}^-\text{COO}^- \right]$  Anion localized on 2 oxygen atoms

B  $\left[ \text{C}_6\text{H}_5\text{O}^- \leftrightarrow \text{C}_6\text{H}_5\text{O}^- \leftrightarrow \text{C}_6\text{H}_5\text{O}^- \leftrightarrow \text{C}_6\text{H}_5\text{O}^- \right]$

C  $\text{CH}_3\text{CH}_2\text{O}^-$  no resonance!

4. The following reaction runs downhill. Identify each species as either the acid (A), base (B), conjugate acid (CA), or conjugate base (CB). Circle one. Discuss among yourselves why you chose each answer.

