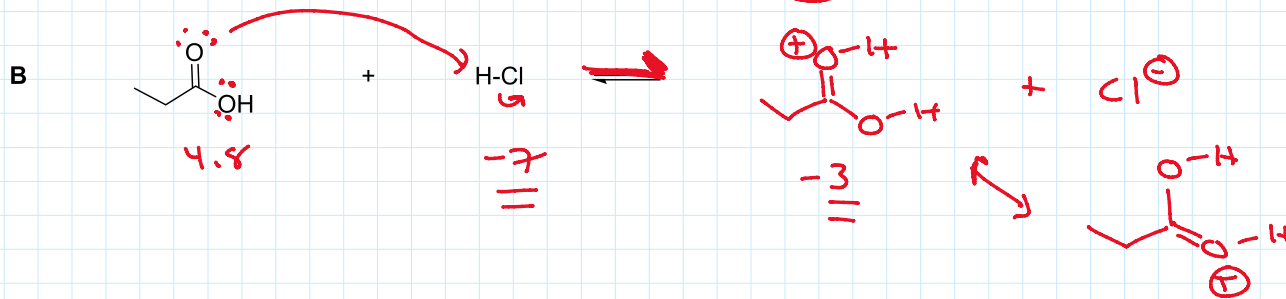
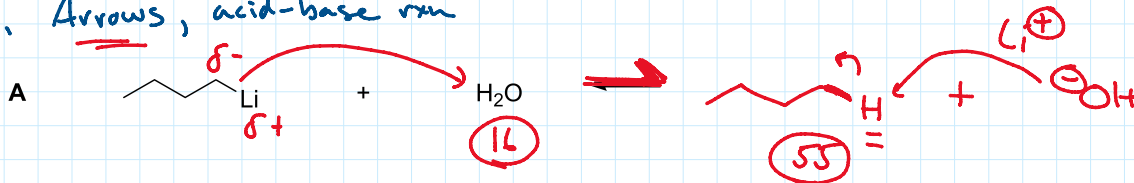
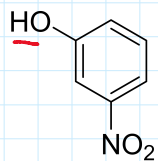


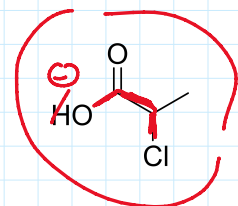
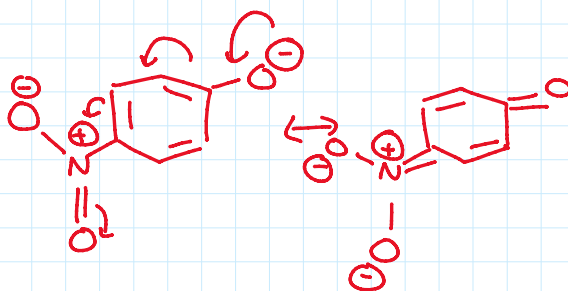
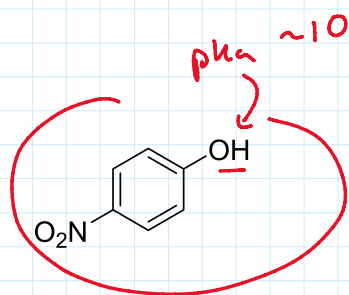
1. Arrows, acid-base rxn



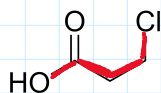
2. Most acidic?



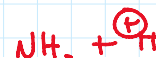
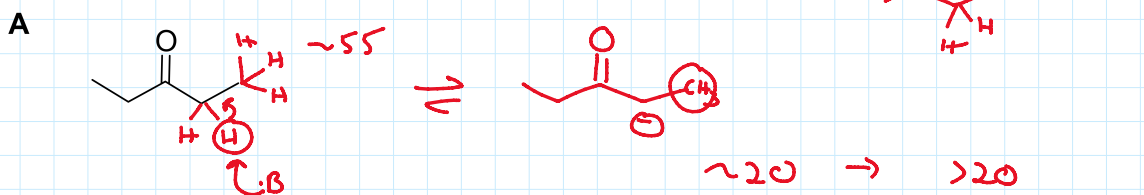
vs.

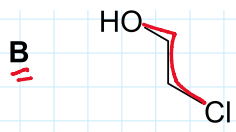


vs.

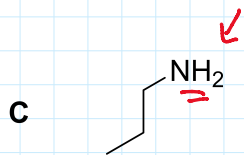
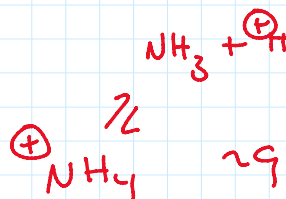
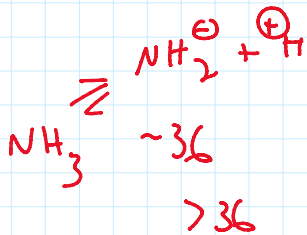


3. Estimate pKa

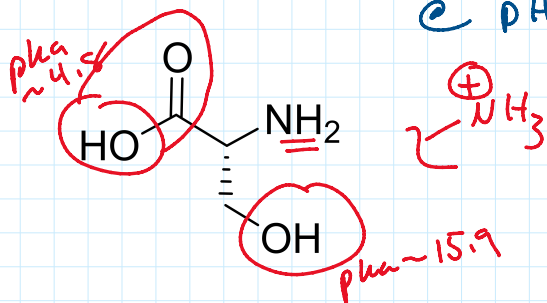
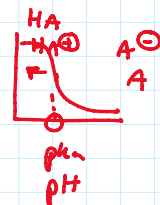




15.9
15.9 >



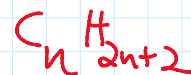
4. Major protonation state in H_2O
 @ $\text{pH} = 2, 7, 10$



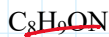
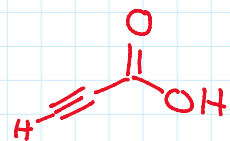
| | COOH | OH | $-\text{NH}_3^+$ | NET |
|------------------|----------------|----|------------------|-----|
| $\text{pH} = 2$ | COOH | OH | NH_3^+ | +1 |
| $\text{pH} = 7$ | COO^- | OH | NH_3^+ | 0 |
| $\text{pH} = 10$ | COO^- | OH | NH_2 | -1 |

5. Do U?

$$\frac{2C + 2 + N - H - X}{2} = D$$



$$\frac{2 \cdot 3 + 2 + 0 - 2 - 0}{2} = \frac{6 + 2 - 2}{2} = \frac{6}{2} = 3$$



$$\frac{2 \cdot 8 + 2 + 1 - 9 - 0}{2} = \frac{16 + 3 - 9}{2} = \frac{10}{2} = 5$$

