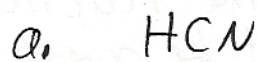
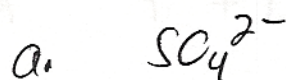


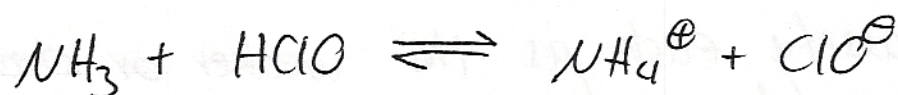
1. Draw the conjugate bases



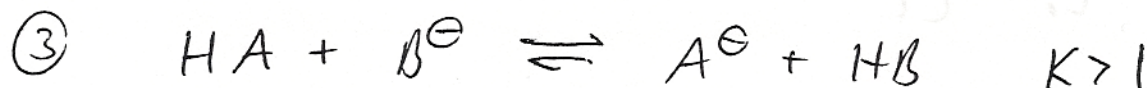
2. Draw the conjugate acids



3. Identify each as an acid or base

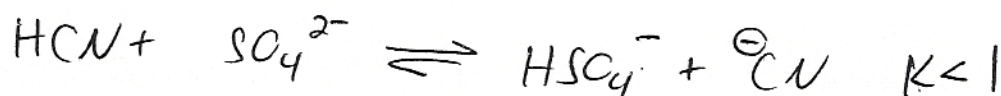


- ① HF is stronger than HNO_2 .
 Predict the "direction" of the reaction,
 and say whether K will be greater or
 less than 1. (ID each as Acid or base)

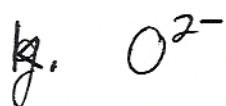
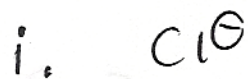
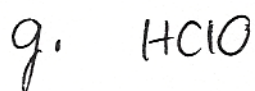
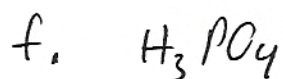
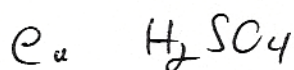
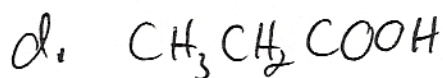
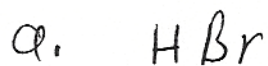


Classify each as the weaker or stronger
 acid or base.

④ Ditto for



① Classify as Strong Acid, Weak Acid, Strong Base, Weak Base, or Non-acid/base



1. Find pH for following

a. $[H_3O^+] = 1.0 \times 10^{-4}$

b. $[H^+] = 1.0 \times 10^{-11}$

c. $[H^+] = 3.2 \times 10^{-4}$

d. $[OH^-] = 1.0 \times 10^{-8}$

e. $[OH^-] = 5.8 \times 10^{-4}$

f. $pOH = 8.30$

2. Find pOH:

a. $[H^+] = 3.9 \times 10^{-5}$

b. $[OH^-] = 3.9 \times 10^{-5}$

c. $pH = 3.95$

3. Find both

$[H^+]$

$[OH^-]$

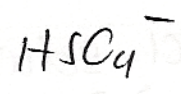
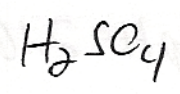
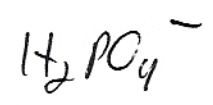
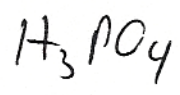
a. $pH = 3.72$

b. $pH = 9.81$

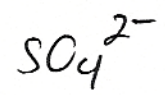
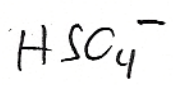
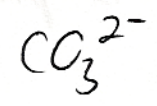
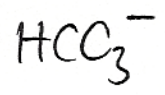
c. $[H^+] = 3.5 \times 10^{-8}$

d. $[OH^-] = 4.1 \times 10^{-3}$

① which is the stronger acid?



② which is the stronger base?



① What is pH of $1.36 \times 10^{-3} \text{ M H}_2\text{SO}_4$?

② An HCl solution has $\text{pH} = 2.16$. What is $[\text{HCl}]$?

③ What is pH for 0.013 M KOH solution?

④ What is pH for a solution that is 0.013 M in $\text{Ca}(\text{OH})_2$?

⑤ What is pH if 22 g of $\text{Ba}(\text{OH})_2$ (90 g/mol) is dissolved in 760 mL of water?

1. $\text{pH} \rightarrow K_a$ What is K_a for an acid if an 0.15 M solution is prepared and found to have $\text{pH} = 4.86$?

2. $K_a \rightarrow \text{pH}$ What is pH for a 0.15 M solution of an acid with $K_a = 2.2 \times 10^{-6}$?

3. If an 0.23 M solution of an acid gives $\text{pH} = 3.82$, what is K_a for acid?

4. If a 0.11 M solution has a $K_a = 1.3 \times 10^{-8}$ acid, what is pH ?

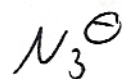
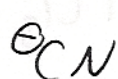
① $\text{pH} \rightarrow K_b$ What is K_b if an 0.123 M solution of a weak base gives $\text{pH} = 10.42$?

② $K_b \rightarrow \text{pH}$ If K_b for a weak base is 1.6×10^{-5} , what is the pH of an 0.222 M solution of the base?

	<u>K_a</u>
HCN	4.9×10^{-10}
HF	6.8×10^{-4}
HN ₃	1.9×10^{-5}

1. What is K_b for N_3^- ?

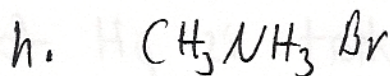
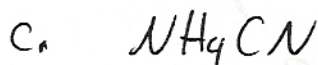
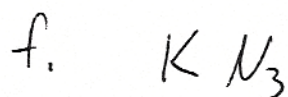
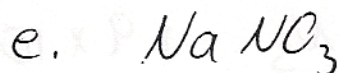
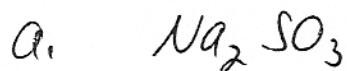
2. Rank the basicity, 1 being highest.



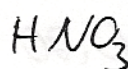
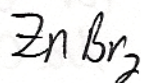
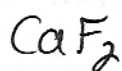
3. What is pH for a solution that is 0.12 M in NaF?

4. What is pH for a solution that is 0.20 in NaCN?

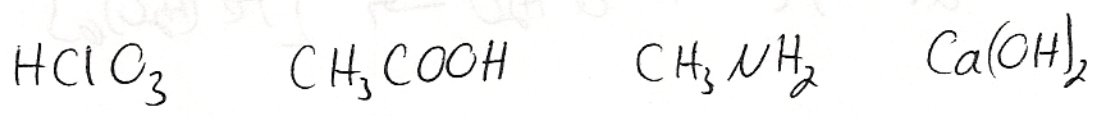
1. Predict as Acidic, Basic, Neutral,
or Can't Tell



2. Rank the following in terms of increasing
pH, 1 being lowest. (ID as strong/weak
acid, strong/weak base, or neutral first!)



① Which are acidic vs. basic vs. neutral in water?



② Rank Acidity (1 strongest)



③ Rank Acidity



④ Rank Acidity H_2O H_2S H_2Se

⑤ " " HBr H_2Se H_3As H_4Ge

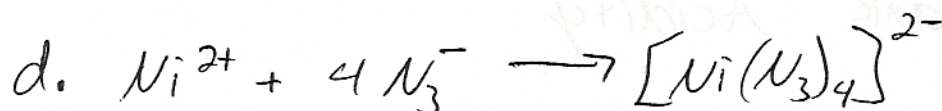
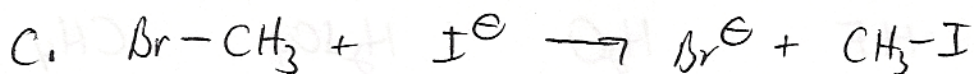
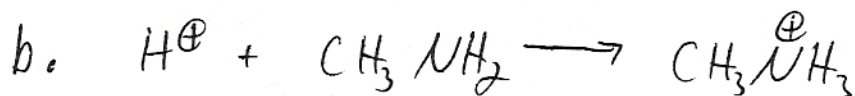
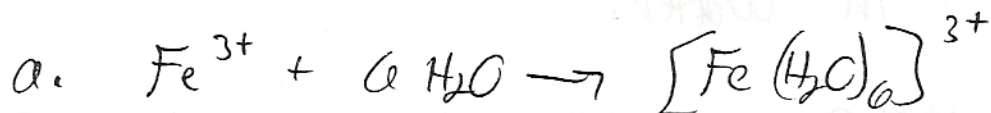
⑥ Which would be strong? HBrO_3 HBrO



⑦ Rank basicity CH_3^- NH_2^- OH^- F^-

⑧ " " HPO_4^{2-} H_2PO_4^- HSO_4^-

① Identify the Lewis acid + Lewis base



② Which would not be a Lewis acid?

