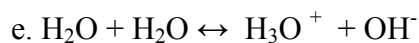
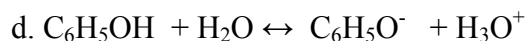
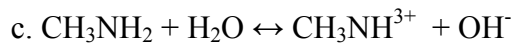
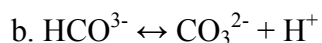
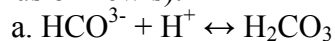


Worksheet 5. Aqueous Equilibrium Problems; Simple Equilibria

1. Identify the acid/base and their conjugate base/acid, and which definition you use to determine (Bronsted, Arrhenius or Lewis):



2. Assuming $K_w = 1 \times 10^{-14}$, calculate the molarity of OH^- in solutions at 25°C when the H^+ concentration is:

a. 0.2M

b. 5×10^{-10} M

c. 100 M

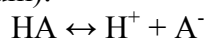
3. For each of these **strong** acid/base solutions, calculate the molarity of OH^- , H^+ , pH and pOH

a. 0.01M NaOH

b. 5M HNO_3

c. 0.007M $\text{Ba}(\text{OH})_2$

4. Fill in the blank (all concentrations are at equilibrium):



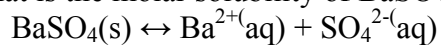
Acid	[HA]	[H^+]	[A^-]	K_a
Chlorous acid HClO_2	0.6	??	.077	1.0×10^{-2}
Nitrous acid	18.6	.20	4	??
Hydrocyanic acid HCN	??	7×10^{-5}	2×10^{-4}	4.9×10^{-10}
Phosphoric acid H_3PO_4	0.076	0.3	??	7.6×10^{-3}

5. The pH of a 0.115M solution of chloroacetic acid, ClCH_2COOH , is measured to be 1.92. Calculate K_a for this monoprotic acid.

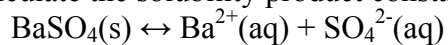
6. Calculate the concentrations of all the species and the pH in 0.10 M hypochlorous acid, HOCl . For HOCl , $K_a = 3.5 \times 10^{-8}$.

7. One liter of saturated barium sulfate solution contains 0.0025 grams of dissolved BaSO_4 .

(a) What is the molar solubility of BaSO_4 ?



(b) Calculate the solubility product constant for BaSO_4 .



8. Calculate the molar solubility, silver and chloride ion concentrations, and solubility in grams per liter for saturated AgCl ($K_{sp} = 1.8 \times 10^{-10}$).

