Chem 1515
Problem Set #12
Fall 2001

Name	
TA Name	
	Lab Section #

ALL work must be shown to receive full credit. Due 5:00 pm on Tuesday, November 6, 2001.

PS12.1. Calculate the pH of a 0.200 M H₃PO₄. Calculate the [PO₄³-] in the solution.

- PS12.2. Predict the products of the following neutralization reactions.
 - a) $HCl(aq) + NaOH(aq) \rightarrow$
 - b) $HNO_3(aq) + Ba(OH)_2(aq) \rightarrow$
 - c) NaOH(aq) + H₂CO₃(aq) \rightarrow
 - d) $NH_3(aq) + H_2SO_4(aq) \rightarrow$
 - e) $HC_6H_5O(aq) + NaOH(aq) \rightarrow$
 - f) $HCN(aq) + KOH(aq) \rightarrow$
- PS12.3. Given a solution containing the following ions (neglect the counter–ion for the moment), write a reaction (with water) and indicate whether the ion acts as an acid or as a base.
 - a) $F^-(aq)$
 - b) $ClO_2^-(aq)$
 - c) $NO_2^-(aq)$
 - d) $NH_4^+(aq)$
 - e) $CH_3NH_3^+$ (aq)
 - $f) \quad C_2H_5NH_3^+(\mathit{aq})$
- PS12.4. Can you make any generalizations about the acid-base character of the ions in Problem #12.3? If so, state them.

- PS12.5. Indicate an acid and a base which could react, in a neutralization reaction, to form each of the following salts. In some cases water will be present as another product.
 - a) $NaC_6H_7O_6(aq)$
 - b) KClO(aq)
 - c) $(CH_3)_2NH_2NO_3(aq)$
 - d) $NH_4Br(aq)$
 - e) KCl(aq)
 - f) $(NH_4)_2SO_4(aq)$
- PS12.6. If each salt in Problem 12.5 is added to water, indicate whether the resulting solution is acidic, basic or neutral.

PS12.7. Calculate the pH of the following salt solutions a) $0.243~M~NaC_6H_7O_6$

b) 0.319 M C₅H₅NHClO₄

c)	0.890	М	KC1
C)	0.090	IVI	VCI

d) 0.572 M KC₃H₅O₂

e) 1.00 M NaHSO₄

PS12.8. In the series of oxyacids, XOH, OXOH, and O_2XOH , list the acids in order of increasing acid strength. Justify your answer.