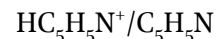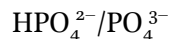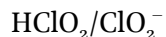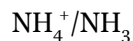Quiz 17.1 – Buffer Solutions

Name: _____

Question 1

Each acid/base conjugate pair can act as a buffer.
Give the pH range over which each pair below works (Consult Appendix A.3 for K_a values):

NH_4^+/NH_3 $HClO_2/ClO_2^-$ HPO_4^{2-}/PO_4^{3-} $HC_5H_5N^+/C_5H_5N$

Question 2

$1.5 \, g$ of $MgF_2(s)$ are dissolved in a $100.0 \, ml$ solution of $0.5 \, M$ HF. Find the pH of the solution

Question 3

Find the pH if $25.0 \, ml$ of $0.75 \, M$ HCl are added to the buffer solution prepared in Question 2

Question 4

You want to make a buffer solution with $pH = 9.750$ using a HCN/CN$^-$ buffer. You have one solution with $[HCN] = 0.100 \, M$ and another with $[CN^-] = 0.200 \, M$ which you can mix together to make the buffer. If you start with $125 \, ml$ of the HCN solution, How many ml of CN$^-$ solution should you use?

Question 5

Find the buffer capacity of the solution prepared in Question 4 (The easy way: how many moles of strong acid and strong base could be added before all buffer reactants are consumed?)

My Voice

By Rafael Campo

To cure myself of wanting Cuban songs,
I wrote a Cuban song about the need
For people to suppress their fantasies,
Especially unhealthy ones. The song
Began by making reference to the sea,
Because the sea is like a need so great
And deep it never can be swallowed. Then
The song explores some common myths
About the Cuban people and their folklore:
The story of a little Carib boy
Mistakenly abandoned to the sea;
The legend of a bird who wanted song
So desperately he gave up flight; a queen
Whose strength was greater than a rival king's.
The song goes on about morality,
And then there is a line about the sea,
How deep it is, how many creatures need
Its nourishment, how beautiful it is
To need. The song is ending now, because
I cannot bear to hear it any longer.
I call this song of needful love my voice.