Chemistry Pretet 3.4 Lab Portion Only

Practice for Lab Section of Next test. Don't forget to prepare yourself for the 10 theory questions too. Go to http://www.emsb.qc.ca/laurenhill/science/chemacademy3.html

Green class can vote for 3 of the 5 labs we did (so far we have no votes for the Kc lab) and for two topics under each chapter (Gases, Energy, Rates, Equilibrium, Acids-Base Equil'm)

CHEM-03	CHEM-01	CHEM-02
Le Chat	Ka	Ka
Stoich of Redox	stoich redox	stoich redox
Electrochem Lab	Electrochem Lab	Electrochem Lab
Pv=nRT	Pv=nRT	Pv=nRT
changes of State	changes of State	changes of State
Hess	Hess	Hess
Bond Energy	calorimetry	calorimetry
Ae graphs,	rate law mechanism	rate law mechanism
Factors Affecting rates	effective collision temp graphs ; effective....	
defnEqui State	defnEqui State	defnEqui State
Ksp	Ksp	Ksp
phpOH deriv	Ka	Ka
Bronsted Lowry	Bronsted Lowry	Bronsted Lowry

1. Given: $[Fe(H_2O)_6]^{3+}_{(aq)} + 3\ SCN^-_{(aq)} = [Fe(H_2O)_3(SCN)_3]_{(aq)} + 3\ H_2O$

   Orange colorless red

   What substance should you add to the above equilibrium to create an orange solution? Here are some possible choices. Justify your answer.

   (1) A solution of $FeCl_3$, which is light orange.
   (2) A solution of silver nitrate; AgSCN does not dissolve in water
   (3) A drying agent that would remove water
   (4) More red thiocyanate compound

2. $Fe^{3+}_{(aq)} + SCN^-_{(aq)} = Fe((SCN)^{2+}_{(aq)} +$

   Why did the addition of solid KSCN create a darker color than adding aqueous iron ion if both push the equilibrium to the right?

3. In the oxidation of the iron nail-lab with copper solution by consulting the table of reduction potentials, can you think of a replacement for Cu^{2+} and a replacement for iron that would lead to a very similar lab?

4. Given: $Cu^{2+} + Fe \rightarrow Fe^{2+} + Cu$
This reaction with the nail in direct contact was fast --- you even saw the blue color of Cu^{2+} fade. And yet the same concentration of Cu^{2+} in the battery lab created a very slow reaction? How come?

5. How many measurements do you need in the lab to get a weak acid's K_A? What equipment is needed for each measurement?

6. Are any sig fig errors being made at any stage in solving this problem? Why or why not?

Problem: *Calculate the quantity of electricity (Coulombs) necessary to deposit 100.00 g of copper from a $CuSO_4$ solution. Analyze all three steps.*

Solution:

1) Determine moles of copper plated out:

100.00 g divided by 63.546 g/mole = 1.573663 mol

2) Determine moles of electrons required:

$Cu^{2+} + 2e^- \rightarrow Cu$

therefore, every mole of Cu plated out requires two moles of electrons.

1.573663 mol x 2 = 3.147326 mol e^- required

3) Convert moles of electrons to Coulombs of charge:

3.147326 mol e^- x 96,485.309 C/mol = 3.0367 x 10^5 C