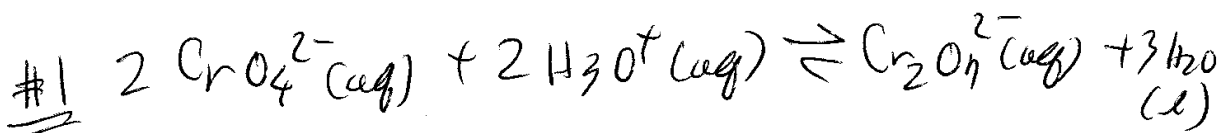


# Experiment 21 - Equilibria

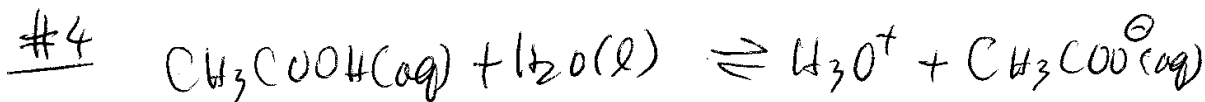
page  
①

Part I - this is application  
of Le Chatelier's Principle

for example

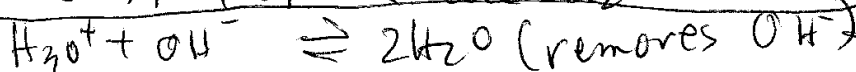
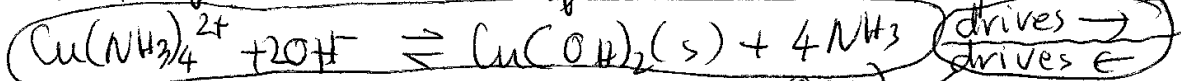
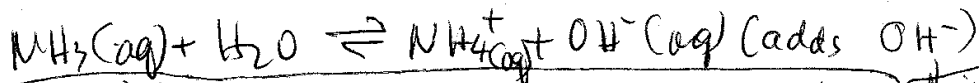
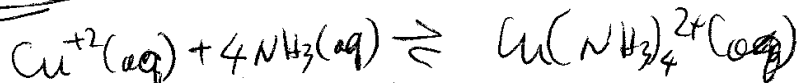


add  $\text{H}_2\text{SO}_4$  add  $\text{H}_3\text{O}^+$  drives  $\text{Rxn} \rightarrow$   
add  $\text{NaOH}$  removes  $\text{H}_3\text{O}^+$  drives  
 $\text{Rxn} \leftarrow$

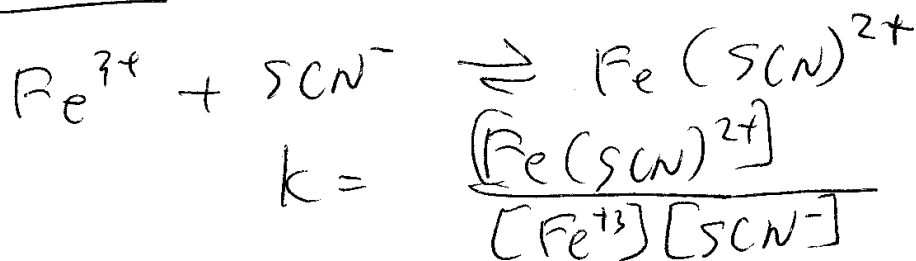


add  $\text{CH}_3\text{COO}^-$  drives  $\text{Rxn} \leftarrow$

#5 @



Part II



We are doing an ICE problem with known  $\text{Fe}^{3+}$ , known  $\text{SCN}^-$  initial & know  $\text{Fe}(\text{SCN})^{2+}$  from your Spec 20 results & calibration curve p. 75 (to go from Absorbance to concentration in M (x-axis))

Example Test tube #1

5.0 ml of 0.020 M  $\text{Fe}(\text{NO}_3)_3$  +  
 5.0 ml  $\text{H}_2\text{O}$  + 10.0 ml of 0.00050 M  
 $\text{KSCN} \rightarrow V_{\text{final}} = 20.0 \text{ ml}$

$$M_f \text{Fe}(\text{NO}_3)_3 = \frac{(0.020 \text{ M Fe}^{3+})(5.0 \text{ ml})}{20.0 \text{ ml}}$$

From dilution into

$$M_f \text{Fe}^{3+} = 5.0 \times 10^{-3} \text{ M}$$

Test tube #1

initial concentration of  $\text{Fe}^{3+}$  in ICE table

$$M_g \text{ KSCN} = \frac{(0.00050 \text{ M KSCN})(10.0 \text{ mL})}{(20.0 \text{ mL})} \quad (\text{page 3})$$

from dilution  
into test  
tube #1

$$M_g \text{ KSCN} = 2.5 \times 10^{-4} \text{ M} \leftarrow \text{initial concentration in ICE table of KSCN}$$



	$[\text{Fe}^{+3}]$	$[\text{SCN}^{-}]$	$[\text{Fe}(\text{SCN})^{2+}]$
initial	$5.0 \times 10^{-3}$	$2.5 \times 10^{-4}$	0
change	-x	-x	+x
equilibrium	$5.0 \times 10^{-3}$ -x	$2.5 \times 10^{-4}$ -x	x

lab book has setup for excel spread sheets for these calculations

a # not a variable

from UV measurement + calibration curve on P. 75 book