Report Sheet for Experiment #7:
"Chemical Equilibrium and LeChâtelier's Principle"

Table of the Colors of Compounds used in this experiment

Compound	Color	Compound	Color	Compound
$CoCl_2 \cdot 6\ H_2O$	red	$[Cu(H_2O)_6]^{2+}$	light blue	$[Cu(NH_3)_4(H_2O)_2]^{2+}$
$[Co(H_2O)_6{}^{2+}]$	red	$Cu(OH)_2$	blue ppt	color of above compound
$[CoCl_4]^{2+}$	blue	$[CuBr_4]^{2-}$	brown	a very dark blue

Part 2: Reaction #1

$[Co(H_2O)_6]^{2+}{}_{(aq)} + 4\ Cl^-{}_{(aq)} \rightarrow [CoCl_4]^{2-}{}_{(aq)} + 6\ H_2O_{(l)}$

Color Direction Explain

7(a): After adding 12 M HCl: _____ _____ _____

7(b): After adding $AgNO_3$ _____ _____ _____

7(c): After heating _____ _____ _____

7(d): After cooling _____ _____ _____

Part 3: Reaction #3

8): $[Cu(H_2O)_6]^{2+}{}_{aq} + 4\ Br^-{}_{(aq)} \rightarrow [CuBr_4]^{2-}{}_{(aq)} + 6\ H_2O_{(l)}$

Volume	Color	Volume	Color
1^{st} – mL		6^{th} – mL	
2^{nd} – mL		7^{th} – mL	
3^{rd} – mL		8^{th} – mL	
4^{th} – mL		9^{th} – mL	
5^{th} - mL		10^{th} – mL	

Explain what is happening: Consider the octahedral shape of the $[Cu(H_2O)_6]^{2+}{}_{aq}$ and what is happening to the bromide ions when water is being added. Remember copper is the central metal ion of both the tetrahedral shape of the $[CuBr_4]^{2-}$ complex ion and the $[Cu(H_2O)_6]^{2+}{}_{aq}$.

Reaction #1: $[Cu(H_2O)_6]^{2+}{}_{(aq)} + 4\ NH_{3(aq)} \rightarrow [Cu(NH_3)_4(H_2O)_2]^{2+} + 4\ H_2O_{(l)}$

9): $CuBr_2$ + 6 M NH_3 Color _____ Direction _____ Why_____

10): Add HNO_3 Color _____ Direction _____ Why _____