Name _____   Lab Partner _____

TA Name _____   Section _____   Date _____

Solubility Product Constants Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet.

Table A: Absorbances of Standard Cu^{2+} Solutions

Standard Cu^{2+} Solutions	Absorbance at _____ nm
1: 5.0×10^{-4} M $Cu(NO_3)_2$	
2: 1.0×10^{-3} M $Cu(NO_3)_2$	
3: 5.0×10^{-3} M $Cu(NO_3)_2$	
4: 1.0×10^{-2} M $Cu(NO_3)_2$	
Equation of Trendline _____ R^2 Value _____	

Table B: Absorbances of Solutions Saturated with $Cu(IO_3)_2$

$Cu(IO_3)_2$ Saturated Solutions	Absorbance at _____ nm	$[Cu^{2+}]$	$[IO_3^{1-}]$
A: 1.0×10^{-2} M KIO_3		M	M
B: 5.0×10^{-3} M KIO_3		M	M
C: deionized water		M	M
D: 1.0×10^{-3} M $Cu(NO_3)_2$		M	M
E: 5.0×10^{-3} M $Cu(NO_3)_2$		M	M

1. Using the trendline from your calibration curve, calculate the $[Cu^{2+}]$ in each of the solutions A - E. Show one representative calculation neatly. Enter these results in Data Table B.

2. Calculate the $[IO_3^-]$ in each of the solutions A - E. Remember that for solutions A and B where IO_3^- was originally present, you must account for the initial amount plus any ions that were formed due to the solubility of the solid. Show one representative calculation neatly. Enter these results in Data Table B.

3. Calculate the K_{sp} for each of the solutions A - E. Show one representative calculation neatly. Enter these results in Data Table C.

Table C: Calculated K_{sp} and Solubilities of $Cu(IO_3)_2$

$Cu(IO_3)_2$ Saturated Solutions	Calculated K_{sp}	Calculated Solubility
A: 1.0×10^{-2} M KIO_3		M
B: 5.0×10^{-3} M KIO_3		M
C: deionized water		M
D: 1.0×10^{-3} M $Cu(NO_3)_2$		M
E: 5.0×10^{-3} M $Cu(NO_3)_2$		M
Average		-----------------

4a. Calculate the average of your five K_{sp} values. Enter the result in Data Table C.

4b. The literature value for the K_{sp} of $Cu(IO_3)_2$ is 6.85×10^{-8}. How does this compare to your average experimental values?

What is the percent error compared to your average?

$$\% \text{ error} = \frac{\text{experimental - theoretical}}{\text{theoretical}} \text{ x } 100$$

5. Calculate the solubility of $Cu(IO_3)_2$ in each of the five solutions. Remember that for solutions D and E where Cu^{2+} was originally present, you must subtract the initial amount from the equilibrium amount to get the amount formed due to the solubility of the solid. Show one representative calculation neatly. Enter these results in Data Table C.

6. Looking at your solubility results for solutions A and B as compared to C, did the solubility increase, decrease or stay about the same in the solutions that originally contained IO_3^- ions?

Does this confirm the common ion effect? If not, can you explain why it does not?

7. Looking at your solubility results for solutions D and E as compared to C, did the solubility increase, decrease or stay about the same in the solutions that originally contained Cu^{2+} ions?

Does this confirm the common ion effect?

If not, can you explain why it does not?