Lab 4 Name _____

General Chemistry 2 Kinetics of iodination of acetone

Experimental

a) Room temperature

b) Recipes and reaction times

Do each experiment twice. Make sure volumes add up to 25 mL.

#	V in mL Acetone(aq)	V in mL Water	V in mL HCl(aq)	V in mL Iodine(aq)	t_1 in s	t_2 in s	t_{ave} in s
1	10.0		5.0	5.0			
2	5.0		5.0	5.0			
3	10.0		2.5	5.0			

Calculating orders and rate constant

Calculate the concentrations using the dilution law. As a reminder, you are working with a 4-M acetone solution, a 1-M HCl solution and a 0.005-M iodine solution. Once you know the concentrations, calculate the rate from the time required to use up iodine present in the mixture. Leave the last column empty for now.

#	c in M Acetone(aq)	c in M HCl(aq)	c in M Iodine(aq)	rate in M/s	rate constant in _____
1					
2					
3					

Table 2

What is the reaction order for acetone? Explain, stating which data you are comparing.

What is the reaction order for hydrochloric acid? Explain, stating which data you are comparing.

What is the rate law? Remember, the order for iodine is zero.

Solve the rate law for the rate constant *k*.

Using this formula, enter the units for the rate constant in table 2, calculate the rate constants for each set of experiments and enter them in table 2.

What is your best estimate of the rate constant (with unit)?

Based on your experiments and interpretation, choose acetone and HCl concentrations that you predict will result in a reaction mixture that takes 120 s to complete the reaction. Keep the iodine concentration at 0.001 M.

What is the desired rate?

#	[Ac] in M	[HCl] in M	$t_{predicted}$ in s	V in mL Acetone(aq)	V in mL Water	V in mL HCl(aq)	V in mL iodine(aq)	$t_{measured}$ in s
contest							5.0	

Reflect on your experience today ("What part of the calculation was the hardest?" or other prompt)