

Name: _____

Date _____

**LABORATORY DATA SHEET: Determination of the Rate Law
(method of initial rate)**

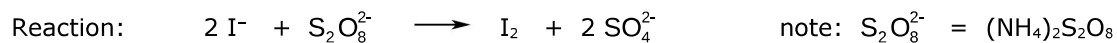


TABLE 1: Reagent concentrations and temperature

[$\text{Na}_2\text{S}_2\text{O}_3$] : _____ M [KI] : _____ M

[$(\text{NH}_4)_2\text{S}_2\text{O}_8$] : _____ M T : _____ °C

TABLE 2: Solution composition and time observed for the “clock” reaction (Laboratory data sheet)

Exp.	FLASK 1			FLASK 2			Time (s)	
	KI	KCl	$\text{Na}_2\text{S}_2\text{O}_3$	$(\text{NH}_4)_2\text{S}_2\text{O}_8$	$(\text{NH}_4)_2\text{SO}_4$	starch	run 1	run 2
1	30.0 mL	0.0 mL	15.0 mL	30.0 mL	0.0 mL	5 drops		
2	15.0 mL	15.0 mL	15.0 mL	30.0 mL	0.0 mL	5 drops		
3	30.0 mL	0.0 mL	15.0 mL	10.0 mL	20.0 mL	5 drops		

Useful equations:

$$[\text{S}_2\text{O}_3^{2-}]_0 = \frac{([\text{Na}_2\text{S}_2\text{O}_3] \text{ reagent}) \times (\text{volume } \text{Na}_2\text{S}_2\text{O}_3)}{\text{total volume}}$$

$$\text{Rate} = \frac{[\text{S}_2\text{O}_3^{2-}]_{t=0}}{2t}$$

$$[\text{S}_2\text{O}_8^{2-}]_0 = \frac{([\text{(NH}_4)_2\text{S}_2\text{O}_8] \text{ reagent}) \times (\text{volume } (\text{NH}_4)_2\text{S}_2\text{O}_8)}{\text{total volume}}$$

$$[\text{I}^-]_0 = \frac{([\text{KI}] \text{ reagent}) \times (\text{volume KI})}{\text{total volume}}$$

The total volume for each run is 75.0 mL

TABLE 3: Solution composition and time

Exp.	average time, s	Rate, $\text{M}\cdot\text{s}^{-1}$	[$\text{S}_2\text{O}_8^{2-}$] ₀ , M	[I^-] ₀ , M
1				
2				
3				