

Name _____ Date _____ Period _____

Kinetics Problems Worksheet 1

1. The following reaction occurs at 25°C. $2 \text{ Na} + 2 \text{ H}_2\text{O} \rightarrow 2 \text{ NaOH} + \text{ H}_2$

Exp.	[A] mol/L	[B] mol/L	Rate of formation of C (M/min)
1	0.10	0.10	4.0×10^{-4}
2	0.20	0.20	3.2×10^{-3}
3	0.10	0.20	1.6×10^{-3}
4	0.20	0.10	8.0×10^{-4}
5	0.30	0.15	
6		0.40	1.28×10^{-2}

- Describe the order for sodium and water.
 - Calculate the rate constant.
 - Write the rate equation.
 - Calculate the rate for Trial 5
 - Calculate the concentration of Na given the data from Trial 6.
2. Given the rate constant $k = 62.1 \text{ M}^{-1} \text{ s}^{-1}$ for a reaction which is second order for reactant A, calculate the rate of the reaction (M/sec) when the initial concentration of A is 0.0050 M.

3. $2 \text{ MnO}_4^- + 5 \text{ H}_2\text{C}_2\text{O}_4 + 6 \text{ H}^+ \rightarrow 2 \text{ Mn}^{2+} + 10 \text{ CO}_2 + 8 \text{ H}_2\text{O}$

$[\text{MnO}_4^-]_0$	$[\text{H}_2\text{C}_2\text{O}_4]_0$	$[\text{H}^+]$	Initial Rate (M/s)
1×10^{-3}	1×10^{-3}	1.0	2×10^{-4}
2×10^{-3}	1×10^{-3}	1.0	8×10^{-4}
2×10^{-3}	2×10^{-3}	1.0	1.6×10^{-3}
2×10^{-3}	2×10^{-3}	2.0	1.6×10^{-3}
1.2×10^{-3}	3.5×10^{-3}	1.3	

- Describe the order for each reactant.
- Write the rate equation.
- Calculate the rate for Trial 5.