Name _____ Date _____ Period _____

Kinetics Problems Worksheet 1

1. The following reaction occurs at 25°C. $2\ Na + 2\ H_2O \rightarrow 2\ NaOH + H_2$

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}

a) Describe the order for sodium and water.

b) Calculate the rate constant.

c) Write the rate equation.

d) Calculate the rate for Trial 5

e) Calculate the concentration of Na given the data from Trial 6.

2. Given the rate constant $k = 62.1\ M^{-1}\ s^{-1}$ 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. $2\ MnO_4^- + 5\ H_2C_2O_4 + 6\ H^+ \rightarrow 2\ Mn^{2+} + 10\ CO_2 + 8\ H^2O$

$[MnO_4^-]_0$	$[H_2C_2O_4]_0$	$[H^+]$	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	

a) Describe the order for each reactant.

b) Write the rate equation.

c) Calculate the rate for Trial 5.