Mr. Bracken
AP Chemistry

Name _____
Period ____

Kinetics Worksheet #1

Ref: Mr. Dick Powell, Chemistry Teacher, Arlington, Texas, Personal Communication, July, 2003. Revised November, 2009.

For each of the following problems:

(a) write the rate expression

(b) calculate the **k** (rate constant) **including units**

1. **$A + 2B \rightarrow C + 2D$**

Trial	A (M)	B (M)	Initial Rate Formation of **C** (M/min)
1	0.10	0.10	2.0×10^{-4}
2	0.30	0.30	6.0×10^{-4}
3	0.30	0.10	2.0×10^{-4}
4	0.40	0.20	4.0×10^{-4}

2. **$2A + B + 2C \rightarrow D + 2E$**

Trial	A (M)	B (M)	C (M)	Initial Formation of **D** (M/min)
1	0.10	0.20	0.10	5.0×10^{-4}
2	0.20	0.20	0.30	1.5×10^{-3}
3	0.30	0.20	0.10	5.0×10^{-4}
4	0.40	0.60	0.30	4.5×10^{-3}

3. **$2NO + 2H_2 \rightarrow N_2 + 2H_2O$**

Trial	NO (M)	H_2 (M)	Initial Rate of Disappearance of NO (M/s)
1	0.630	0.122	0.305
2	0.210	0.122	0.0339
3	0.210	0.244	0.0678
4	0.105	0.488	0.0339

4. **A + 5 B → 2 C + 2 D**

Trial	A (M)	B (M)	Initial Rate of Form. of C (M/s)
1	0.010	0.010	2.0
2	0.010	0.040	8.0
3	0.030	0.020	12
4	0.060	0.020	24

5. **A + B → products**

Trial	A (M)	B (M)	Initial Rate of Reaction (M/s)
1	0.10	0.10	0.0090
2	0.40	0.10	0.144
3	0.10	0.50	0.045

6. **$2\ ClO_2 + 2\ OH^{1-} \rightarrow ClO_3^{1-} + ClO_2^{1-} + H_2O$**

Trial	ClO_2^- (M)	OH^- (M)	Initial Rate of Reaction (M/s)
1	0.015	0.015	3.88×10^{-4}
2	0.030	0.015	1.55×10^{-3}
3	0.015	0.030	7.76×10^{-4}
4	0.030	0.030	3.11×10^{-3}

7. **$2\ NO + Cl_2 \rightarrow 2\ NOCl$**

Trial	NO (M)	Cl_2 (M)	Initial Rate (M/hr)
1	0.50	0.50	1.14
2	1.00	0.50	4.56
3	1.00	1.50	13.68