

Name: _____

Period: _____

Seat#: _____

Directions: Any worksheet that is labeled with an * means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website...and the entire internet! See me if you need help finding practice on a topic you are struggling with.

- 1) For a particular reaction at constant temperature, $A(g) + 2 B(g) \rightarrow \text{products}$

What is the value of "?" in this table? _____

Run	Initial [A]	Initial [B]	Initial Rate
1	1	1	1
2	2	4	8
3	3	9	27
4	4	2	?

- 2) What is a rate law? What is the proportionality constant called?

- 3) What is meant by the order of a reaction?

- 4) The rate law for the reaction $2 NO + O_2 \rightarrow 2 NO_2$ is $\text{Rate} = k[NO]^2[O_2]$. At 25°C, $k = 7.1E^9 \text{ L mol}^{-2}\text{s}^{-1}$. What is the rate of reaction when $[NO] = 0.0010 \text{ mol/L}$ and $[O_2] = 0.034 \text{ mol/L}$?

- 5) The initial rate of the rxn below has been measured at the reactant []'s shown (in mol/L). According to these results what would be the initial rate (in mol/Ls) if all three [] are:

$[BrO_3^-] = [Br^-] = [H^+] = 0.20 \text{ M}$?

$BrO_3^-(aq) + 5 Br^-(aq) + 8 H^+(aq) \rightarrow 3 Br_2(l) + H_2O(l)$				
Exp.	$[BrO_3^-]$	$[Br^-]$	$[H^+]$	Initial Rate
1	0.10	0.10	0.10	$8.0E-4$
2	0.20	0.10	0.10	$1.6E-3$
3	0.10	0.20	0.10	$1.6E-3$
4	0.10	0.10	0.20	$3.2E-3$

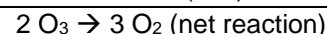
- 6) The reaction of iodide ion with hypochlorite ion, OCl^- (which is found in liquid bleach), follows the equation $OCl^- + I^- \rightarrow OI^- + Cl^-$. It is a rapid reaction that gives the following rate data. What is the rate law for the reaction, Determine the value of the rate constant

Initial $[OCl^-]$
 $1.7E^{-3}$
 $3.4E^{-3}$
 $1.7E^{-3}$

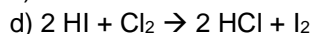
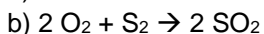
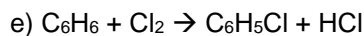
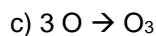
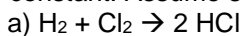
Initial $[I^-]$
 $1.7E^{-3}$
 $1.7E^{-3}$
 $3.4E^{-3}$

Rate of Formation of Cl^- ($M\text{s}^{-1}$)
 $1.75E^4$
 $3.50E^4$
 $3.50E^4$

- 7) The decomposition of ozone, O_3 , is believed to occur by the two-step mechanism below. $O_3 \rightarrow O_2 + O$ (slow)
 $O + O_3 \rightarrow 2 O_2$ (fast)



- 8) Write expressions for the rate of formation of the product(s) in each of the following. Indicate the units of the rate constant. Assume single step



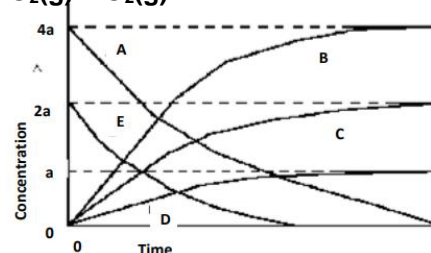
- 9) What is a homogeneous catalyst? How does it function, in general terms?

- 10) What is a heterogeneous catalyst? How does it function?

- 11) MCQ: Consider the decomposition of dinitrogen pentoxide: $2 N_2O_5(g) \rightarrow 4 NO_2(g) + O_2(g)$

Given that the initial concentration of N_2O_5 is $2a \text{ mol/L}$, which line in the graph shows the concentration of $O_2(g)$ as a function of time?

- a) Line A, starts at $4a$ and ends near zero
 b) Line B, starts at zero and ends near $4a$
 c) Line C, starts at zero and ends near $2a$
 d) Line D, starts at zero and ends near a .
 e) Line E, starts at $2a$ and ends near zero



- 12) MCQ: Given the rxn: $A + B \rightarrow C + D$ The reaction will most likely occur at the greatest rate if A and B represent

- a) nonpolar molecular compounds in the solid phase b) ionic compounds in the solid phase
 c) solutions of nonpolar molecular compounds d) solutions of ionic compounds

- 13) MCQ: The value for the energy of activation of the forward reaction is represented by which letter in the diagram below? a) A b) B c) C d) D e) E

