Worksheet #7*

Initial

[A]

2

3

Initial

[B]

1

4

9

2

Initial Rate

8

27

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) → products What is the value of "?" in this table?	Run
	What is the value of : in this table:	1
2/	What is a vota law? What is the preparticuality constant called?	

- What is a rate law? What is the proportionality constant called?
- 3) What is meant by the order of a reaction?
- 4 4) The rate law for the reaction 2 NO + O₂ \rightarrow 2 NO₂ is Rate= k[NO]²[O2]. At 25°C, k=7.1E⁹ L mol-2s⁻¹. What is the rate of reaction when [NO] = 0.0010 mol/L and [O₂]=0.034 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 M?
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BrO_3^- (aq) + 5 Br^- (aq) + 8 H^+ (aq)> 3 $Br_2(I) + H_2O(I)$							
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			

3

6) The reaction of iodide ion with hypochlorite ion, OCI- (which is found in liquid bleach), follows the equation $OCI^- + I^- \rightarrow OI^- + CI^-$ 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 [OCI ⁻]	Initial [l⁻]	Rate of Formation of Cl ⁻ (Ms ⁻¹)
1.7E ⁻³	1.7E ⁻³	1.75E ⁴
3.4E ⁻³	1.7E ⁻³	3.50E ⁴
1.7E ⁻³	3.4E ⁻³	3.50E⁴

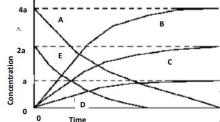
- 7) The decomposition of ozone, O_3 , is believed to occur by the two-step mechanism below. $O_3 \rightarrow O_2 + O$ (slow) If this is the mechanism, what is the reaction's rate law? $O + O_3 \rightarrow 2 O_2$ (fast) $2 O_3 \rightarrow 3 O_2$ (net reaction)
- 8) Write expressions for the rate of formation of the product(s) in each of the following. Indicate the units of the rate constant. Assume single step
 - a) $H_2 + Cl_2 \rightarrow 2 HCl$
- c) $3 O \rightarrow O_3$

e) $C_6H_6 + Cl_2 \rightarrow C_6H_5Cl + HCl$

- b) $2 O_2 + S_2 \rightarrow 2 SO_2$
- d) 2 HI + Cl₂ \rightarrow 2 HCl + I₂
- 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 N₂O₅ (g) ----> 4 NO₂(g) + O₂(g) Given that the initial concentration of N₂O₅ is 2a mol/L,

which line in the graph shows the concentration of O₂(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



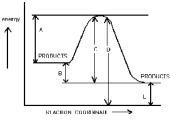
- 12) MCQ: Given the rxn: A + B → C + D The reaction will most likely occur at the greatest rate if A and B represent
 - a) nonpolar molecular compounds in the solid phase b) ionic compounds in the solid phase
 - c) solutions of nonpolar molecular compounds
- d) solutions of ionic compounds
- 13) MCQ: 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

- **14)** MCQ: Consider the rxns: Rxn I
- $Ag^{+}(aq) + I^{-}(aq) \rightarrow AgI(s)$

Rxn II 4 Fe(s) + 3 O₂(g) \rightarrow 2 Fe₂O₃(s)

Which one of the following best described the relative rates of the two rxns?

- a) II is faster than I
- c) I and II are both fast
- b) I and II are both slow
- d) I is faster than II
- **15)** Persons who have been submerged in very cold water and who are believed to have drowned sometimes can be revived. On the other hand, persons who have been submerged in warmer water for the same length of time have died. Explain this in terms of factors that affect the rates of chemical reactions.



- **16** a) What is meant by the order of a rxn?
 - b) Can the order be determined from the equation for the overall rxn?
 - c) If the sum of the coefficients of the reactants in the equation equals the total order of a reaction, can it be assumed that the equation represents an elementary process?
- 17) MCQ: The rate of the chemical reaction between substances A and B is found to follow the equation: Rate= k[A]²[B] where k is a constant. If the concentration of A is halved, what should be done to the concentration of B to make the reaction go to 75% of its former rate?
 - a) The concentration of B should be kept constant
- d) The concentration of B should be halved
- b) The concentration of B should be doubled
- e) The concentration of B should be multiplied by 4/3
- c) The concentration of B should be tripled
- **18)** MCQ: If doubling the pressure doubles the number of collisions in a sample of gas, one expects the number of productive collisions leading to a chemical reaction to be:
 - a) Unchanged
- b) Halved
- c) Doubled
- d) More than halved
- e) More than doubled.

EVEN MORE PRACTICE! Hard work now during the chapter will set you up for success and save you time long term! Make smart, mature choices!

- 1) Consider doing some of the Honors Chem worksheets! You would be surprised how many AP Chem students miss points on exams for Honors level questions and not even the AP level questions! You will hear me all year long saying "don't lose points in AP Chem for Honors level material!" www.mychemistryclass.net/HCrainbowpacket12.html
- 2) Read, take notes, try some problems from your Tro online Textbook. Remember that the textbook often covers more material than we need for this class. If it isn't something I talked about in my lectures/ handouts/ worksheets, then you can skip it! I won't officially assign reading or problems from the textbook because it isn't a very efficient way to teach this class, but some students might need to read the textbook sections or do extra practice in order for things to "click" differently for them. That is ok! Not everyone is going to need the same amount or type of studying. A lot of this class is figuring out what you personally need to do in order to feel successful. You will have access to the textbook all year, don't forget about it! https://www.mlm.pearson.com/northamerica/ masteringchemistry/
 - Chapter 14: Chemical Kinetics

- AP Chem Tab \rightarrow Study Materials Link \rightarrow Scroll to the chapter we are on \rightarrow Extra Study Materials Link.
- I don't always have answer keys for the extra materials. If there is one, it will be in the folder!
- 4) ScienceGeek.net has some good online practice tests. I haven't checked all of them, but the ones I have checked are pretty good! https://www.sciencegeek.net/APchemistry/APtaters/directory.shtml
- **5)** Don't forget that there is extra practice on GoFormative too! www.goformative.com
 - Another teacher made some assignments on GoFormative the year the school was Remote due to Covid. I have not proofread all the remote assignments, but I have published them so they are available for you to try if you would like!
- 6) Don't forget that there is extra practice on AP Classroom too! https://myap.collegeboard.org
 - AP Classroom is a bit clunky, doesn't allow me to easily post questions in the order we go, sometimes crashes, still has old material we no longer cover, etc. BUT it is a source of questions that we know came from College Board!
 - You can use the "tags" I made to pull up practice that is just on the chapter you're interested in.
- 7) Don't forget that our school has free peer tutoring available through the Academic Leadership class! The links are on the top of my Class Calendar.
- 8) Don't forget that you can sign up for my Access periods! You must sign up by Tuesday 8am of the week you want to attend. The links are on the front page of my class website and at the top of my Class Calendar.

3) Don't forget that there is extra practice on the class website too! www.mychemistryclass.net