

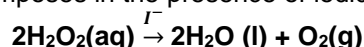
Name: _____

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.

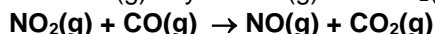
1) Hydrogen peroxide decomposes in the presence of iodide ion. The reaction is:



Using the following data, determine the rate law and the value of the rate constant.

Rate (M min ⁻¹)	[H ₂ O ₂] (mol L ⁻¹)
1.01 x 10 ⁻³	0.1
2.02 x 10 ⁻³	0.2
4.04 x 10 ⁻³	0.4
6.06 x 10 ⁻³	0.6

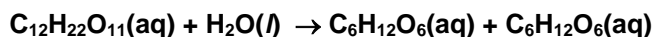
2) At 325°C, NO₂(g) reacts with CO(g) to yield NO(g) and CO₂(g). The reaction is:



It is observed that the reaction rate does not depend upon the concentration of CO, and so the reaction rate law does not involve [CO]. The rate does depend upon [NO₂], however, and the following data is obtained. Determine the rate law and the value of the rate constant.

Rate (M sec ⁻¹)	[NO ₂] (mol L ⁻¹)
1.1 x 10 ⁻²	0.15
4.5 x 10 ⁻²	0.3
1.8 x 10 ⁻¹	0.6
4.0 x 10 ⁻¹	0.9

3) Sucrose decomposes in aqueous solution into a mixture of two sugars, glucose and fructose.



The observed initial rates of decomposition of sucrose at two different initial sucrose concentrations at 25°C are:

Rate (M sec ⁻¹)	[sucrose] (mol L ⁻¹)
8.5 x 10 ⁻³	0.1
1.71 x 10 ⁻²	0.2

Find the dependence of the reaction rate on the concentration of sucrose and compute the rate constant for the reaction.

4) Given: A + B → C

Determine the rate law

Calculate the rate constant

Determine the rate when [A] = 0.05 and [B] = 0.10

[A] (mol L ⁻¹)	[B] (mol L ⁻¹)	Rate (M sec ⁻¹)
0.1	0.1	4.0 x 10 ⁻⁵
0.1	0.2	4.0 x 10 ⁻⁵
0.2	0.1	16 x 10 ⁻⁵

5) Data for the reaction of ammonium and nitrite ions in water at 25°C follows. Determine the rate law for this reaction.

[NO ₂ ⁻]	[NH ₄ ⁺]	Rate (M sec ⁻¹)
0.01	0.2	5.4 x 10 ⁻⁷
0.02	0.2	10.8 x 10 ⁻⁷
0.04	0.2	21.5 x 10 ⁻⁷
0.06	0.2	32.2 x 10 ⁻⁷
0.2	0.02	10.8 x 10 ⁻⁷
0.2	0.04	21.6 x 10 ⁻⁷
0.2	0.06	32.4 x 10 ⁻⁷
0.2	0.08	43.3 x 10 ⁻⁷

6) Given: 2NO(g) + Br₂(g) → 2NOBr(g). Determine the reaction rate law and the rate constant

[NO] (mol L ⁻¹)	[Br ₂] (mol L ⁻¹)	Rate (M min ⁻¹)
0.1	0.1	4.0 x 10 ⁻⁵
0.1	0.2	4.0 x 10 ⁻⁵
0.2	0.1	16 x 10 ⁻⁵

Answers:

1. 1.01 x 10⁻² min⁻¹
2. 0.489 M⁻¹ sec⁻¹
3. 8.5 x 10⁻² sec⁻¹
4. 1. X 10⁻⁵ M⁻¹ sec⁻¹
5. -
6. 4.0 x 10⁻³ M⁻¹ min⁻¹

Dougherty Valley HS Chemistry - AP Kinetics – Extra Method of Initial Rates

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!

- 7) 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



- 8) 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

- 9) Don’t forget that there is extra practice on the class website too! www.mychemistryclass.net
AP Chem Tab → Study Materials Link → Scroll to the chapter we are on → 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!

- 10) 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>

- 11) 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!

- 12) 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 Q’s 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 are interested in studying.

- 13) Don’t forget that our school has free peer tutoring available through the Academic Leadership class! The links for peer tutoring are on the top of my Class Calendar.

- 14) 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.