

HW 10, chemistry 2, 2024 (it has 3 questions)

- Please watch this video. Starting at the 6-minute mark, there is a section about logarithmic functions. If you're not familiar with logarithms, don't worry—you don't need to understand that part. Instead, focus on gaining a basic understanding of kinetics. We'll discuss your general understanding of the topic and what you think is important to know about it.

<https://youtu.be/wYqQCojggyM?si=t2CuGpyJLkxKOkfE>

- Consider reaction $2A + B \rightarrow C + D$

The following data were received

experiment	[A] mol/L	[B] mol/L	Rate mol/L s
1	1.2	2	5×10^{-3}
2	2.4	2	1×10^{-2}
3	6	2	2.5×10^{-2}
4	6	8	0.1

Find the order of the reaction with respect to A

Find the order with respect to B

Find the overall order of the reaction (you add the order with respect to A to the order with respect to B) For help look at what we did in the class:

$$A + 2B \rightarrow C + D$$

experiment	[A], mol/L	[B] mol/L	rate mol/L.s
1	0.1	0.1	0.5
2	0.3	0.1	4.5
3	0.3	0.2	4.5

[A] from exp. 1 to 2

$$0.1 \times 3 = 0.3$$

$$0.5 \times 3^2 = 4.5$$

second order w.r.t. respect to A

[B] ex. 2 to 3

$$0.1 \times 2 = 0.2$$

$$4.5 \rightarrow 4.5$$

$$4.5 \times 2^0 \rightarrow 4.5$$

0 order w.r.t. with respect to B

Overall order of the rxn

$$2 + 0 = 2$$

$$\text{rate} = k [A]^2 [B]^0$$

$$\text{rate} = k [A]^2$$

we take 4.5 = k [0.3]²

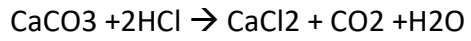
information

$$k = 50$$

from

experiment 2 (but we can take any other experiment)

3. Consider this experimental data from the following reaction:



I graphed it (x – time (s); y – volume (ml) of carbon dioxide produced), and put a tangent line at zero for you. Calculate the initial rate of the reaction.

