

CH302 TA Practice Quiz 6 In principle this can be done without a calculator if you use the hints provided and a piece of scratch paper.

Note: $\ln 2 = .693$

1. Consider the reaction below. Which of the following is the correct rate expression?



- $-\Delta [A]/(2\Delta t) = -\Delta [B]/(\Delta t) = \Delta [C]/(\Delta t)$
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2. Consider the data below:

Experiment	Initial [Xe] (M)	Initial [F ₂] (M)	Initial Rate (M/sec)
1	0.5	0.25	0.00156
2	1.5	1.0	0.05625
3	0.75	0.25	0.0032
4	1.50	0.25	0.01406
5	0.5	1.0	0.00625

Which of the following is a correct rate law for the reaction between Xe and F₂?

- $r = k[\text{Xe}][\text{F}_2]$
- $r = k$
- $r = k[\text{Xe}][\text{F}_2]^2$
- $r = k[\text{Xe}]^2[\text{F}_2]$

3. What is the order of the reaction if $k = 5 \times 10^7 \text{ M}^{-2}\text{s}^{-1}$?

- 1st order
- 2nd order
- 3rd order
- 0th order

4. Consider a reaction with the activation energy of 1.6 kJ/mol. At room temperature $k = 2.3 \times 10^3 \text{ s}^{-1}$. Calculate the temperature when the rate constant is $2.2 \times 10^3 \text{ s}^{-1}$. (Hint:

$\ln(0.9565) = -0.045$)

- 279K
- 300K
- 298 K
- 295 K

5. You sneak 500 Cheetos into a movie theatre where the movie playing is 90 minutes long. If the rate constant for your Cheetos-eating is 5 Cheetos per minute, how many Cheetos do you have in your possession when a theatre-employee throws you out of the movie for texting after 40 minutes?

- None, he forcefully removed them from you along with your cell phone.
- 200
- 300
- 50

6. If the half life of a compound is 13.86 seconds and it decays in a first order reaction, what is the reaction constant, k ? $[C_0] = 2 \text{ M}$

a. $.05 \text{ M/s}$

b. $.072 \text{ M/s}$

c. $.05 \text{ s}^{-1}$

d. $.072 \text{ s}^{-1}$

7. Which of the following statements does not explain why a thermodynamically favorable reaction, a reaction where $\Delta G < 0$, may not occur?

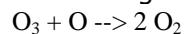
a. There was not enough free energy to overcome the activation energy of the reaction.

b. There is only enough energy to form the transition state complex.

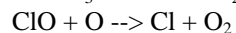
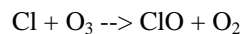
c. The reactants did not collide in the proper orientation.

d. The temperature is low, and the reaction is endothermic.

8. Consider the following reaction:



If the mechanism is:



Which compound is the catalyst and which compound is an intermediate?

a. ClO, ClO

b. ClO, Cl

c. O, ClO

d. Cl, ClO