Consider the reaction $\text{C}_4\text{H}_9\text{Br} + \text{OH}^\text{-1} \rightarrow \text{C}_4\text{H}_9\text{OH} + \text{Br}^\text{-1}$. 

When the concentration of $\text{C}_4\text{H}_9\text{Br}$ is doubled, the rate of the reaction increases by a factor of two. When the concentrations of all reactants and products are doubled, the rate also doubles. What is the overall order of the reaction?

1. Zero order
2. First order
3. Second order
4. Third order
5. Fourth order
6. Fifth order
Consider the reaction $C_4H_9Br + OH^{-} \rightarrow C_4H_9OH + Br^{-}$.

When the concentration of $C_4H_9Br$ is doubled, the rate of the reaction increases by a factor of two. When the concentrations of all reactants and products are doubled, the rate also doubles. **What is the overall order of the reaction?**

1. Zero order
2. First order
3. Second order
4. Third order
5. Fourth order
6. Fifth order

- 80% 2. First order
For the same material, does it take longer for 1 ton to go to ½ ton or for 1 gram to go to ½ gram?

1. It takes longer to go from 1 gram to ½ gram

2. It takes longer to go from 1 ton to ½ ton

3. The conversion times are equal.
For the same material, does it take longer for 1 ton to go to ½ ton or for 1 gram to go to ½ gram?

1. It takes longer to go from 1 gram to ½ gram
2. It takes longer to go from 1 ton to ½ ton
3. The conversion times are equal.

3%  93%  4%

1. 2. 3.
Which is the correct calculation of the number of nuclei in 1.5 microgram of $^{99}$Tc?

1. $1.5 \times 10^{-3} \text{ g} \times \frac{1 \text{ mol}}{98. \text{ g}} \times 6.022 \times 10^{23} \text{ mol}^{-1} = 9.2 \times 10^{18}$

2. $1.5 \times 10^{-6} \text{ g} \times \frac{1 \text{ mol}}{98. \text{ g}} \times 6.022 \times 10^{23} \text{ mol}^{-1} = 9.2 \times 10^{15}$

3. $1.5 \times 10^{-6} \text{ g} \times \frac{1 \text{ mol}}{99. \text{ g}} \times 6.022 \times 10^{23} \text{ mol}^{-1} = 9.1 \times 10^{15}$

4. $1.5 \times 10^{-6} \text{ g} \times \frac{1 \text{ mol}}{99. \text{ g}} = 1.5 \times 10^{-8}$
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The y-intercept is equal to:

1. \( \frac{1}{[A]_t} \)
2. \( \frac{1}{[A]_0} \)
3. \([A]_t\)
4. \([A]_0\)
The y-intercept is equal to:

1 / \([A]_t\)

1. \(1 / [A]_t\)
2. \(1 / [A]_0\) 😊
3. \([A]_t\)
4. \([A]_0\)

2%  
93% 😊
1%
4%
Example(s) of an uni-molecular process

1. \( \text{CO}_2 (g) \rightarrow \text{C} (\text{gr}) + \text{O}_2 (g) \)
2. \( \text{U}^{238} \rightarrow \text{Th}^{234} \)
3. \( \text{NO}_2 + \text{CO} \rightarrow \text{NO} + \text{CO}_2 \)
4. 1 and 2
5. 1 and 3
6. All of the above
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5.111 Principles of Chemical Science
Fall 2014

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