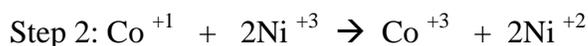
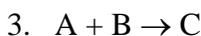


## D20 Classwork Review for Unit 3

1. Relatively fast rates of chemical reactions are associated with which of the following?
- The presence of a catalyst
  - Low Temperatures
  - Low concentration of reactants
  - Strong bonds in reactant molecules
  - High activation Energy



The proposed steps for a catalyzed reaction between  $\text{Sn}^{+4}$  and  $\text{Co}^{+1}$  are represented above. The products of the overall catalyzed reaction are \_\_\_\_\_ & \_\_\_\_\_. Which substance is the catalyst and which substance is the intermediate?

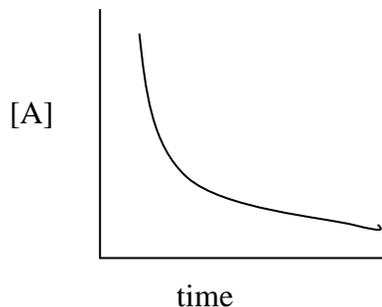


For the hypothetical reaction above, what possible rate law shows that when [A] and [B] are doubled, the initial rate of reaction will increase by a factor of two? \_\_\_\_\_ & \_\_\_\_\_

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

4. The rate of a certain chemical reaction between substances A and B obeys the rate law above. The reaction is first studied with [A] and [B] each  $4 \times 10^{-3}$  molar. If a new experiment is conducted with [A] and [B] each  $8 \times 10^{-3}$  molar, the reaction rate will increase by a factor of \_\_\_\_\_.

5. For the reaction  $2\text{A} \rightarrow \text{B}$ , a plot of [A] vs. time is shown below. What conclusion regarding the reaction order may be made?

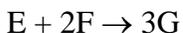


6. For the reaction  $2\text{A} + 2\text{B} \rightarrow 3\text{C}$ , it was determined that the reaction was second order overall. The rate law for this reaction might be \_\_\_\_\_.

7. For a reaction, the rate law is  $\text{rate} = k[\text{E}]^1[\text{F}]^2[\text{G}]^2$ . What are the units for k if time is in sec?

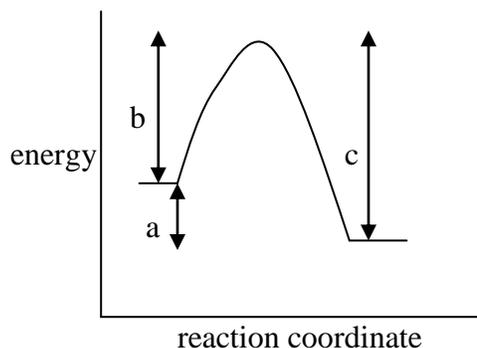
8. In studying the reaction  $2 X \rightarrow Z$ , a plot of  $\ln[X]$  vs. time provided a straight line plot with a slope of  $-1.34/\text{sec}$ . What is the rate law for the reaction including the value of the  $k$ ?

---



9. When the above reaction takes place, the rate law is  $\text{Rate} = k[F]$ . If the temperature of the reaction chamber is decreased, what would be true?

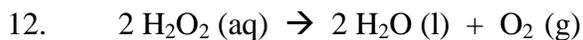
10. For the graph below what do “b” and “c” represent? What would adding a catalyst do and what would it change “b” or “c”?



11. Hydrogen peroxide in basic solution oxidizes iodide ions to iodine. The proposed mechanism for this reaction is



Write the overall reaction. Write the rate law consistent with this proposed mechanism.



For the above reaction 0.100 mol/L of hydrogen peroxide is consumed in 72.0 min. What is the average rate of consumption of hydrogen peroxide? At what rates are the water and oxygen being made?

13. At low temperatures the rate law for the rxn  $\text{CO}(\text{g}) + \text{NO}_2(\text{g}) \rightarrow \text{CO}_2 (\text{g}) + \text{NO}(\text{g})$  is  $\text{rate} = k[\text{NO}_2]^2$

Which mechanism is a possible choice?

