

Advanced Chemistry Reaction Rates

NAME: _____ PER: _____

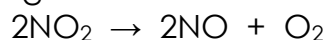
Instructions: Complete the following problems. SHOW ALL WORK in the empty space below the questions.
Remember the units. Round to the correct number of significant figures.

Concept Questions

1. What is meant by the term reaction rates?
2. Name three of the four factors that can affect the rate of a chemical reaction.
3. What are the units usually used to express the rates of reactions?
4. Is the rate of disappearance of reactants always the same as the rate of appearance of products? Explain.

Practice Problems

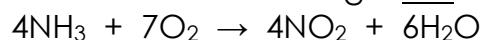
5. Nitrogen dioxide decomposes to nitric oxide and oxygen via the reaction:



A) In a particular experiment at 300.0 °C, $[\text{NO}_2]$ drops from 0.0100 to 0.00650 M in 100.0 s. The rate of disappearance of NO_2 for this period is _____ M/s.

B) In a particular experiment at 300.0 °C, $[\text{NO}]$ rises from 0.00550 to 0.0100M in 100.0 s. The rate of appearance of $[\text{NO}]$ for this period is _____ M/s.

6. Which one of the following is not a valid expression for the rate of the reaction below?



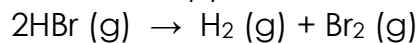
A) $\frac{1}{7} \frac{\Delta[\text{O}_2]}{\Delta t}$

B) $\frac{1}{4} \frac{\Delta[\text{NO}_2]}{\Delta t}$

C) $\frac{1}{6} \frac{\Delta[\text{H}_2\text{O}]}{\Delta t}$

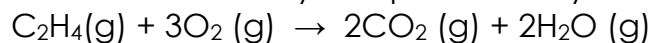
D) $-\frac{1}{4} \frac{\Delta[\text{NH}_3]}{\Delta t}$

7. The rate of disappearance of HBr in the gas phase reaction



is 0.301 M/s at 150.0°C. The rate of appearance of Br₂ is _____ M/s.

8. The combustion of ethylene proceeds by the reaction



A) When the rate of disappearance of O₂ is 0.28 M/s, the rate of appearance of CO₂ is _____ M/s.

B) When the rate of disappearance of O₂ is 0.23 M/s, the rate of disappearance of C₂H₄ is _____ M/s.