

Problem of the Day 15 CHEM 1252

Suggested Book Problems for Chapter 14: 3, 12, 17, 21, 23, 27, 28, 34, 36, 38, 45, 61, 65, 68, 83, 89, 94

1. Answer the following questions.

(a) What does **rate of reaction** mean in qualitative terms?

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(b) If the concentration of a reactant is doubled and the reaction rate doubles, what must be the order of the reaction with respect to that reactant?

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(c) A reaction has the following rate law: $\text{rate} = k [\text{A}]^2 [\text{B}][\text{C}]$. What are the units of the rate constant?

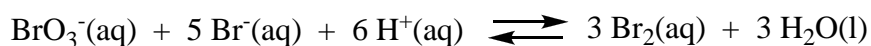
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2. Consider the reaction given below. If, in a certain experiment, over a specific time period, 0.0048 mol PH_3 is consumed in a 2.0-L container each second of reaction, what are the rates of production of P_4 and H_2 in this experiment?



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3. The kinetics of the following reaction were studied.



Using the information provided in the table below, answer the following questions.

Experiment	$[\text{BrO}_3^-]$, M	$[\text{Br}^-]$, M	$[\text{H}^+]$, M	Initial Rate, M/s
1	0.10	0.10	0.10	1.2×10^{-3}
2	0.20	0.10	0.10	2.4×10^{-3}
3	0.10	0.30	0.10	3.6×10^{-3}
4	0.20	0.10	0.15	5.4×10^{-3}

(a) What is the order of the reaction with respect to BrO_3^- ?

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(b) What is the order of the reaction with respect to Br^- ?

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(c) What is the order of the reaction with respect to H^+ ?

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(d) Write the rate law for the reaction.

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(e) What is the value of the rate constant? Include units.

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