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1. 014 Chapter #041

A reaction has the following rate law: $\text{Rate} = k[\text{A}][\text{B}]^2$. In experiment 1, the concentrations of A and B are both 0.10 mol L^{-1} ; in experiment 2, the concentrations are both 0.30 mol L^{-1} . If the temperature stays constant, what is the value of the ratio, $\text{Rate}(2)/\text{Rate}(1)$?

Student Response	Value	Correct Answer	Feedback
a. 3.0			
b. 6.0			
c. 9.0			
d. 18			
e. 27			

Score: 5/5

2. 014 Chapter #021

Which of the following is the correct unit for a first-order rate constant?

Student Response	Value	Correct Answer	Feedback
a. s^{-1}			
b. Ms^{-1}			
c. Ms			
d. $\text{M}^{-1}\text{s}^{-1}$			
e. $\text{M}^{-2}\text{s}^{-1}$			

Score: 5/5

3. 013 Chapter #061

Determine the freezing point of a solution which contains 0.31 mol of sucrose in 175 g of water. $K_f = 1.86^\circ\text{C}/m$

Student Response	Value	Correct Answer	Feedback
a. 3.3°C			
b. 1.1°C			
c. 0.0°C			

d. -1.1°C

e. -3.3°C

Score: 5/5

4. **013 Chapter #021**

Calculate the percent by mass of potassium nitrate in a solution made from 45.0 g KNO_3 and 295 mL of water. The density of water is 0.997 g/mL.

Student Response	Value	Correct Answer	Feedback
a. 1.51%			
b. 7.57%			
c. 13.3%			
d. 15.2%			
e. None of these choices is correct.			

Score: 5/5

5. **013 Chapter #051**

From the following list of aqueous solutions and water, select the one with the highest boiling point.

Student Response	Value	Correct Answer	Feedback
a. 1.0 M KNO_3			
b. 0.75 M NaCl			
c. 0.75 M CuCl_2			
d. 2.0 M $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ (sucrose)			
e. pure water			

Score: 0/5

6. **013 Chapter #031**

The chemist, Anna Lytic, must prepare 1.00 kg of 15.0% (w/w) acetic acid using a stock solution which is 36.0% (w/w) acetic acid ($d = 1.045$ g/mL). Which of the following combinations will give her the solution she wants?

Student Response	Value	Correct Answer	Feedback
a. 417 mL of 36% acetic acid in 583 mL of distilled water			
b. 417 g of 36% acetic acid in 583 g of distilled water			
c. 360 mL of 36% acetic acid in 640 mL of distilled water			
d. 360 g of 36% acetic acid in 640 g of distilled water			
e. 150 g of 36% acetic acid in 850 g of distilled water			

Score: 5/5

7. **013 Chapter #071**

What is the osmotic pressure of a solution prepared from 13.7 g of the electrolyte HCl and enough water to make 0.500 L of solution at 18°C?

Student Response	Value	Correct Answer	Feedback
a. 0.55 atm			
b. 1.10 atm			
c. 8.95 atm			
d. 17.9 atm			
e. 35.9 atm			

Score: 0/5

8. **014 Chapter #002**

For the reaction $\text{BrO}_3^- + 5\text{Br}^- + 6\text{H}^+ \rightarrow 3\text{Br}_2 + 3\text{H}_2\text{O}$ at a particular time, $-\Delta[\text{BrO}_3^-]/\Delta t = 1.5 \times 10^{-2} \text{ M/s}$. What is $-\Delta[\text{Br}^-]/\Delta t$ at the same instant?

Student Response	Value	Correct Answer	Feedback
a. 13 M/s			
b. 7.5×10^{-2} M/s			
c. 1.5×10^{-2} M/s			

d. 3.0×10^{-3}
M/s

e. 330 M/s

Score: 0/5

9. 013 Chapter #025

What is the volume of 2.75 M solution of NaOH that is needed to make 500.0 mL of a 1.27 M concentration of NaOH?

Student Response	Value	Correct Answer	Feedback
a. 231 mL			
b. 1.72 L			
c. 1.10 L			
d. 440 mL			
e. 909 mL			

Score: 5/5

10. 014 Chapter #071

The isomerization of cyclopropane follows first order kinetics. The rate constant at 700 K is $6.20 \times 10^{-4} \text{ min}^{-1}$, and the half-life at 760 K is 29.0 min. Calculate the activation energy for this reaction ($R = 8.314 \text{ J/mol K}$).

Student Response	Value	Correct Answer	Feedback
a. 5.07 kJ/mol			
b. 27.0 kJ/mol			
c. 50.7 kJ/mol			
d. 160. kJ/mol			
e. 270. kJ/mol			

Score: 5/5

11. 014 Chapter #051

The reaction $2\text{NO}_2(\text{g}) \rightarrow 2\text{NO}(\text{g}) + \text{O}_2(\text{g})$ is suspected to be second order in NO_2 . Which of the following kinetic plots would be the most useful to confirm whether or not the reaction is second order?

Student Response	Value	Correct Answer	Feedback
a. a plot of $[\text{NO}_2]^{-1}$ vs. t			
b. a plot of $\ln [\text{NO}_2]$ vs. t			
c. a plot of $[\text{NO}_2]$ vs. t			
d. a plot of $\ln [\text{NO}_2]^{-1}$ vs. t			
e. a plot of $[\text{NO}_2]^2$ vs. t			

Score: 5/5

12. 014 Chapter #061

What is the slope of the plot of the integrated 1st-order rate reaction?

Student Response	Value	Correct Answer	Feedback
a. $1/[\text{A}]$			
b. k			
c. $1/k$			
d. $\ln[\text{A}]$			
e. $-k$			

Score: 5/5

13. 013 Chapter #041

A solution is 40.0% by volume benzene (C_6H_6) in carbon tetrachloride at 20°C. The vapor pressure of pure benzene at this temperature is 74.61 mmHg and its density is 0.87865 g/cm³; the vapor pressure of pure carbon tetrachloride is 91.32 mmHg and its density is 1.5940 g/cm³. If this solution is ideal, its total vapor pressure at 20°C is:

Student Response	Value	Correct Answer	Feedback
a. 84.64 mmHg.			
b. 84.30 mmHg.			
c. 82.96 mmHg.			

d. 81.63
mmHg.

e. 165.93
mmHg.

Score: 5/5

14. 014 Chapter #011

The reaction $A + 2B \rightarrow \text{products}$ was found to follow the rate law: $\text{rate} = k[A]^2[B]$. Predict by what factor the rate of reaction will increase when the concentration of A is doubled, the concentration of B is tripled, and the temperature remains constant.

Student Response	Value	Correct Answer	Feedback
a. 5			
b. 6			
c. 12			
d. 18			
e. None of these choices is correct.			

Score: 5/5

15. 014 Chapter #081

A transition state is a species (or state) corresponding to an energy maximum on a reaction energy diagram.

Student Response	Value	Correct Answer	Feedback
a. TRUE			
b. FALSE			

Score: 5/5

16. 013 Chapter #002

What name is given to the major component in a solution and the "stuff" doing the dissolving?

Student Response	Value	Correct Answer	Feedback
a. supersaturated			
b. solute			

- c. saturated
- d. unsaturated
- e. solvent

Score: 0/5

17. 013 Chapter #011

Which of the following compounds should be soluble in CCl_4 ?

Student Response	Value	Correct Answer	Feedback
a. NaCl			
b. H_2O			
c. NaOH			
d. C_8H_{18}			
e. None of these choices is correct.			

Score: 5/5

18. 014 Chapter #031

A certain first-order reaction $\text{A} \rightarrow \text{B}$ is 25% complete in 42 min at 25°C . What is its rate constant?

Student Response	Value	Correct Answer	Feedback
a. $6.8 \times 10^{-3} \text{ min}^{-1}$			
b. $8.3 \times 10^{-3} \text{ min}^{-1}$			
c. $3.3 \times 10^{-2} \text{ min}^{-1}$			
d. $-3.3 \times 10^{-2} \text{ min}^{-1}$			
e. 11 min^{-1}			

Score: 0/5

19. 013 Chapter #081

Colloidal particles may be solids, liquids or gases.

Student	Value	Correct Answer	Feedback
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Response
a. TRUE
b. FALSE

Score: 5/5

20. 014 Chapter #084

The units of the rate constant depend on the order of the reaction.

Student Response	Value	Correct Answer	Feedback
a. TRUE			
b. FALSE			

Score: 5/5