1. **014 Chapter #041**

A reaction has the following rate law: Rate = $k[A][B]^2$. 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, Rate(2)/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. $M^{-1}s^{-1}$			
e. $M^{-2}s^{-1}$			

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°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* $C_{12}H_{22}O_{11}$ (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 $BrO_3^- + 5Br^- + 6H^+ \rightarrow 3Br_2 + 3H_2O$ at a particular time, $-\Delta[BrO_3^-]/\Delta t = 1.5 \times 10^{-2}$ M/s. What is $-\Delta[Br^-]/\Delta t$ 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 6.20×10^{-4} min^{-1}, and the half-life at 760 K is 29.0 min. Calculate the activation energy for this reaction (R = 8.314 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 $2NO_2(g) \rightarrow 2NO(g) + O_2(g)$ 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 $[NO_2]^{-1}$ vs. t			
b.	a plot of ln $[NO_2]$ vs. t			
c.	a plot of $[NO_2]$ vs. t			
d.	a plot of ln $[NO_2]^{-1}$ vs. t			
e.	a plot of $[NO_2]^2$ 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/[A]			
b.	*k*			
c.	1/*k*			
d.	ln[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/cm^3; the vapor pressure of pure carbon tetrachloride is 91.32 mmHg and its density is 1.5940 g/cm^3. 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 → products was found to follow the rate law: 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 A → B is 25% complete in 42 min at 25°C. What is its rate constant?

	Student Response	Value	Correct Answer	Feedback
a.	6.8×10^{-3} min^{-1}			
b.	8.3×10^{-3} min^{-1}			
c.	3.3×10^{-2} min^{-1}			
d.	-3.3×10^{-2} 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

	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